Design-Build Request for Proposal
W9128F-17-R-0073

INDOOR SMALL ARMS
FIRING RANGE (FY17)

BUCKLEY AFB,
COLORADO

JULY 2017

US AIR FORCE
US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
NOTE: WHERE CONFLICTS IN PROJECT SPECIFICATIONS EXIST, THE MORE STRINGENT REQUIREMENTS WILL GOVERN.

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-- End of Project Table of Contents --
SOLICITATION, OFFER AND AWARD
(Construction, Alteration, or Repair)

<table>
<thead>
<tr>
<th>1. SOLICITATION NO.</th>
<th>2. TYPE OF SOLICITATION</th>
<th>3. DATE ISSUED</th>
<th>4. CONTRACT NO.</th>
<th>5. REQUISITION/PURCHASE REQUEST NO.</th>
<th>6. PROJECT NO.</th>
<th>7. ISSUED BY CODE</th>
<th>8. ADDRESS OFFER TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>W9128F-17-R-0073</td>
<td>☑ SEALED BID (IFB)</td>
<td>14 AUG 2017</td>
<td></td>
<td></td>
<td></td>
<td>CT</td>
<td>U.S. ARMY CORPS OF ENGINEERS, OMAHA</td>
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<td></td>
<td>☑ NEGOTIATED (RFP)</td>
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<td>Contracting Division (CENWO-CT)</td>
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<td></td>
<td>1616 Capitol Ave</td>
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<td></td>
<td>Omaha, Nebraska 68102-4901</td>
</tr>
</tbody>
</table>

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

1. SOLICITATION NO.

W9128F-17-R-0073

2. TYPE OF SOLICITATION

☑ SEALED BID (IFB)

3. DATE ISSUED

14 AUG 2017

4. CONTRACT NO.

5. REQUISITION/PURCHASE REQUEST NO.

6. PROJECT NO.

7. ISSUED BY CODE

CT

8. ADDRESS OFFER TO

U.S. ARMY CORPS OF ENGINEERS, OMAHA

Contracting Division (CENWO-CT)

1616 Capitol Ave

Omaha, Nebraska 68102-4901

9. FOR INFORMATION CALL:

A. NAME

Katherine Fisher

B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)

(402) 995-2102

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying no., date):

The offeror hereby agrees to do all work described in the documents entitled:

INDOOR SMALL ARMS FIRING RANGE

BUCKLEY AIR FORCE BASE, COLORADO

RETURN WITH OFFER: INFORMATION REQUIRED BY SECTION 00 10 00 (SF1442), SECTION 00 22 00, AND SECTION 00 45 00.

*BLOCK 13A. – REFER TO SECTION 00 22 00 FOR THE NUMBER OF COPIES TO BE SUBMITTED WITH THE ORIGINAL OFFER.

THIS SOLICITATION IS UNRESTRICTED AND IS OPEN TO BOTH LARGE AND SMALL BUSINESS PARTICIPATION.

This solicitation contains additional security requirements that were not in effect prior to 2014. Please reference Section 01 30 00.24, Paragraph 1.4.

11. The Contractor shall begin performance within 10 calendar days and complete it within 540 calendar days after receiving award, notice to proceed. This performance period is mandatory, negotiable.

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS?

(If "YES," indicate within how many calendar days after award in Item 12B.)

☑ YES ☐ NO

12B. CALENDAR DAYS

10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and * copies to perform the work required are due at the place specified in Item 8 by 1400 (hour) local time 15 SEP 2017. If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee ☐ is ☑ is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

NSN 7540-01-155-3212

1442-101

STANDARD FORM 1442(REV. 4-85)

Prescribed by GSA

FAR(48 CFR) 53.236-1(d)
14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)  

DUNS or Unique Entity Identifier Number:

<table>
<thead>
<tr>
<th>CODE</th>
<th>FACILITY CODE</th>
</tr>
</thead>
</table>

15. TELEPHONE NO. (Include area code)

16. REMITTANCE ADDRESS (Include only if different than Item 14)

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within __60__ calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)

**AMOUNTS**

<table>
<thead>
<tr>
<th>SEE ATTACHED CLIN PRICING SCHEDULE</th>
</tr>
</thead>
</table>

Contractor’s Fax No.  
Contractor’s E-Mail address  

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

<table>
<thead>
<tr>
<th>AMENDMENT NO.</th>
<th>DATE</th>
</tr>
</thead>
</table>

20. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER  

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)  

20B. SIGNATURE

20C. OFFER DATE

21. ITEMS ACCEPTED:

22. AMOUNT

23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)

25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO

<table>
<thead>
<tr>
<th>ITEM</th>
<th>10 U.S.C. 2304(c)</th>
<th>41 U.S.C. 253(c)</th>
</tr>
</thead>
</table>

26. ADMINISTERED BY CODE

U.S. Army Engineer District, Omaha  
1616 Capitol Ave.  
Omaha, Nebraska 68102-4901

USAED Omaha  
c/o USACE Finance Center  
5722 Integrity Drive  
Millington, TN 38054-5005

27. PAYMENT WILL BE MADE BY

28. NEGOTIATED AGREEMENT (contractor is required to sign this document and return ___ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.

29. AWARD (Contractor is not required to sign this document.) Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)  

30B. SIGNATURE

30C. DATE

31. NAME OF CONTRACTING OFFICER (Type or print)

31A. NAME OF CONTRACTING OFFICER (Type or print)  

31B. UNITED STATES OF AMERICA

31C. AWARD DATE

STANDARD FORM 1442 BACK (REV. 4-85)
# CONTRACT LINE ITEM PRICING SCHEDULE

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>Entire work complete to Design an Indoor Small Arms Firing Range and Sitework, including Option item(s) listed below.</td>
<td>1</td>
<td>Job</td>
<td>$____________________</td>
</tr>
<tr>
<td>0002</td>
<td>Entire work complete to Construct an Indoor Small Arms Firing Range, up to 5 feet outside of the building, excluding Option item(s) listed below.</td>
<td>1</td>
<td>Job</td>
<td>$____________________</td>
</tr>
<tr>
<td>0003</td>
<td>Entire work complete to Construct Sitework, complete from the five-foot line to the limits of construction of the Indoor Small Arms Firing Range, excluding Option item(s) listed below.</td>
<td>1</td>
<td>Job</td>
<td>$____________________</td>
</tr>
</tbody>
</table>

**TOTAL BASIC AMOUNT $____________________________**

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0004 [Option 1]</td>
<td>Additional cost to Construct Option Area of Indoor Small Arms Firing Range as shown on the Plans.</td>
<td>1</td>
<td>Job</td>
<td>$____________________</td>
</tr>
<tr>
<td>0005 [Option 2]</td>
<td>Additional cost to Demolish and Remove Existing Bullet Trap, in lieu of leaving it in place, as shown on the Plans.</td>
<td>1</td>
<td>Job</td>
<td>$____________________</td>
</tr>
<tr>
<td>0006 [Option 3]</td>
<td>Additional cost to Procure and Install Ledgestone Wainscoting, in lieu of concrete finishing, as shown on the Plans.</td>
<td>1</td>
<td>Job</td>
<td>$____________________</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Quantity</td>
<td>Unit</td>
<td>Amount</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------------------------------------------------</td>
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<td>------</td>
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</tr>
<tr>
<td>0007</td>
<td>Additional cost to Procure and Install Roller Window Shades, in lieu of horizontal blinds, as shown on the Plans.</td>
<td>1</td>
<td>Job</td>
<td>$______________________</td>
</tr>
<tr>
<td>0008</td>
<td>Entire work complete to Construct an additional 13 parking stalls, as shown on the Plans.</td>
<td>1</td>
<td>Job</td>
<td>$______________________</td>
</tr>
</tbody>
</table>

**TOTAL AMOUNT (BASIC PLUS OPTIONS) $__________________________**

**NOTES:**
1. See SECTION 00 21 01, INSTRUCTIONS, CONDITIONS, & NOTICES TO BIDDERS for evaluation of options. The Government reserves the right to exercise the options within 180 days after issuance of Notice to Proceed.
2. Prices must be entered for all items of the schedule. Total amounts submitted without prices being entered on individual items will be rejected. Additions will be subject to verification by the Government. In case of variation between the Job (lump-sum) prices and the total amount, the lump-sum prices will be considered the price submitted.
3. A modification to a proposal which provides for a single adjustment to the total amount submitted, should state the application of the adjustment to each respective lump-sum price affected. If the modification is not so apportioned, the single adjustment will be applied to Item No. 0001.
PART 1 GENERAL

1.1 (FAR 52.204-7) SYSTEM FOR AWARD MANAGEMENT (OCT 2016)
1.2 (FAR 52.204-16) COMMERCIAL AND GOVERNMENT ENTITY CODE REPORTING (JUL 2016)
1.3 (FAR 52.211-2) AVAILABILITY OF SPECIFICATIONS, STANDARDS, AND DATA ITEM DESCRIPTIONS LISTED IN THE ACQUISITION STREAMLINING AND STANDARDIZATION INFORMATION SYSTEM (ASSIST) (APR 2014)
1.4 (FAR 52.215-1) INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (JAN 2017)
1.5 *FAR 52.225-12 NOTICE OF BUY AMERICAN REQUIREMENT-CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2014)
1.6 FAR 52.215-20 REQUIREMENTS FOR CERTIFIED COST OR PRICING DATA AND DATA OTHER THAN CERTIFIED COST OR PRICING DATA (OCT 2010)
1.7 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984)
1.8 (FAR 52.217-5) EVALUATION OF OPTIONS (JUL 1990)
1.9 FAR 52.222-5 CONSTRUCTION WAGE RATE REQUIREMENTS-SECONDARY SITE OF THE WORK (MAY 2014)
1.10 FAR 52.222-58 SUBCONTRACTOR RESPONSIBILITY MATTERS REGARDING COMPLIANCE WITH LABOR LAWS (EXECUTIVE ORDER 13673) (DEC 2016)
1.11 *FAR 52.225-12 NOTICE OF BUY AMERICAN REQUIREMENT-CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2014)
1.12 (FAR 52.232-18) AVAILABILITY OF FUNDS (APR 1984)
1.13 (FAR 52.233-2) SERVICE OF PROTEST (SEPT 2006)
1.14 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).
1.15 (FAR 52.252-1) SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)
1.16 DFARS 252.204-7004) ALTERNATE A, SYSTEM FOR AWARD MANAGEMENT (FEB 2014)
1.17 (DFARS 252.204-7008) COMPLIANCE WITH SAFEGUARDING COVERED DEFENSE INFORMATION CONTROLS (OCT 2016)
1.18 (DFARS 252.215-7008) ONLY ONE OFFER (OCT 2013)
1.19 DEFINITION OF "DESIGN-BUILD" PROCESS
1.20 SOLICITATION RESTRICTIONS
1.20.1 GENERAL CONTRACTOR
1.20.2 ESTIMATED DESIGN AND CONSTRUCTION COST
1.20.3 SUBMISSION, MODIFICATION, REVISION, AND WITHDRAWAL OF PROPOSALS
1.20.4 SUBMISSION DEADLINE
1.20.5 RETURN ADDRESS REQUIREMENTS
1.20.6 CADD AND ELECTRONIC DESIGN FILES (PROVIDED)
1.21 COPIES OF SOLICITATION DOCUMENT AND AMENDMENTS
1.22 OFFEROR'S QUESTIONS AND COMMENTS
1.22.1 BIDDER INQUIRY
1.22.2 PLAN HOLDER'S LIST
1.23 GENERAL DESCRIPTION OF WORK
1.24 PROPOSAL SUBMISSION REQUIREMENTS, EVALUATION AND CONTRACT AWARD
1.25 SOURCE SELECTION BOARD (SSB)
1.26 FEDERAL, STATE AND LOCAL TAXES
1.27 COLORADO SALES AND USE TAX
1.28 JOINT VENTURE AGREEMENTS
1.29 SUBCONTRACTING PLAN/SUBCONTRACTING GOALS REGARDING THE UTILIZATION OF SMALL BUSINESS CONCERNS

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section Table of Contents --
1.1 (FAR 52.204-7) SYSTEM FOR AWARD MANAGEMENT (OCT 2016)

(a) Definitions. As used in this provision-

“Electronic Funds Transfer (EFT) indicator” means a fourcharacter suffix to the unique entity identifier. The suffix is assigned at the discretion of the commercial, nonprofit, or Government entity to establish additional System for Award Management records for identifying alternative EFT accounts (see subpart 32.11) for the same entity.

"Registered in the System for Award Management database" means that-

(1) The Offeror has entered all mandatory information, including the unique entity identifier and the EFT indicator, if applicable, the Commercial and Government Entity (CAGE) code, as well as data required by the Federal Funding Accountability and Transparency Act of 2006 (see subpart 4.14) into the SAM database;

(2) The offeror has completed the Core, Assertions, and Representations and Certifications, and Points of Contact sections of the registration in the SAM database;

(3) The Government has validated all mandatory data fields, to include validation of the Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS). The offeror will be required to provide TIN validation to the Government as a part of the SAM registration process; and

(4) The Government has marked the record "Active".

(b) (1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee shall be registered in the SAM database prior to award, during performance, and through final payment of any contract, basic agreement, basic ordering agreement, or blanket purchasing agreement resulting from this solicitation.

(2) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" or "DUNS +4" followed by the DUNS or DUNS +4 number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number will be used by the Contracting Officer to verify that the offeror is registered in the SAM database.

(c) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one.

(1) An offeror may obtain a DUNS number-

(i) Via the Internet at http://fedgov.dnb.com/webform or if the offeror does not have internet access, it may call Dun and Bradstreet at 1-866-705-5711 if located within the United States; or

(ii) If located outside the United States, by contacting the local Dun and Bradstreet office. The offeror should indicate that it is
an offeror for a U.S. Government contract when contacting the local Dun and Bradstreet office.

(2) The offeror should be prepared to provide the following information:
   (i) Company legal business.
   (ii) Tradestyle, doing business, or other name by which your entity is commonly recognized.
   (iii) Company Physical Street Address, City, State, and Zip Code.
   (iv) Company Mailing Address, City, State and Zip Code (if separate from physical).
   (v) Company Telephone Number.
   (vi) Date the company was started.
   (vii) Number of employees at your location.
   (viii) Chief executive officer/key manager.
   (ix) Line of business (industry).
   (x) Company Headquarters name and address (reporting relationship within your entity).

(d) If the Offeror does not become registered in the SAM database in the time prescribed by the Contracting Officer, the Contracting Officer will proceed to award to the next otherwise successful registered Offeror.

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

(f) Offerors may obtain information on registration at https://www.acquisition.gov.

(End of provision)

1.2 (FAR 52.204-16) COMMERCIAL AND GOVERNMENT ENTITY CODE REPORTING (JUL 2016)

(a) Definition. As used in this provision -

"Commercial and Government Entity (CAGE) code" means -

(1) An identifier assigned to entities located in the United States or its outlying areas by the Defense Logistics Agency (DLA) Commercial and Government Entity (CAGE) Branch to identify a commercial or government entity; or

(2) An identifier assigned by a member of the North Atlantic Treaty Organization (NATO) or by the NATO Support and Procurement Agency (NSPA) to entities located outside the United States and its outlying areas that the DLA Commercial and Government Entity (CAGE) Branch records and maintains in the CAGE master file. This type of code is known as a NATO CAGE (NCAGE) code.

(b) The Offeror shall enter its CAGE code in its offer with its name and address or otherwise include it prominently in its proposal. The CAGE code entered must be for that name and address. Enter "CAGE" before the number. The CAGE code is required prior to award.

(c) CAGE codes may be obtained via-
(1) Registration in the System for Award Management (SAM) at
www.sam.gov. If the Offeror is located in the United States or its outlying
areas and does not already have a CAGE code assigned, the DLA Commercial
and Government Entity (CAGE) Branch will assign a CAGE code as a part of
the SAM registration process. SAM registrants located outside the United
States and its outlying areas shall obtain a NCAGE code prior to
registration in SAM (see paragraph (c)(3) of this provision).

(2) The DLA Contractor and Government Entity (CAGE) Branch. If
registration in SAM is not required for the subject procurement, and the
offeror does not otherwise register in SAM, an offeror located in the
United States or its outlying areas may request that a CAGE code be
assigned by submitting a request at https://cage.dla.mil.

(3) The appropriate country codification bureau. Entities
located outside the United States and its outlying areas may obtain an
NCAGE code by contacting the Codification Bureau in the foreign entity's
country if that country is a member of NATO or a sponsored nation. NCAGE
codes may be obtained from the NSPA at
https://eportal.nspa.nato.int/AC135Public/scage/CageList.aspx if the
foreign entity’s country is not a member of NATO or a sponsored nation.
Points of contact for codification bureaus, as well as additional
information on obtaining NCAGE codes, are available at

(d) Additional guidance for establishing and maintaining CAGE codes
is available at https://cage.dla.mil.

(e) When a CAGE Code is required for the immediate owner and/or the
highest-level owner by 52.204-17 or 52.212-3(p), the Offeror shall obtain
the respective CAGE Code from that entity to supply the CAGE Code to the
Government.

(f) Do not delay submission of the offer pending receipt of a CAGE
code.

(End of provision)

1.3 (FAR 52.211-2) AVAILABILITY OF SPECIFICATIONS, STANDARDS, AND DATA ITEM
DESCRIPTIONS LISTED IN THE ACQUISITION STREAMLINING AND STANDARDIZATION
INFORMATION SYSTEM (ASSIST) (APR 2014)

(a) Most unclassified Defense specifications and standards may be
downloaded from the following ASSIST websites:
   (1) ASSIST (https://assist.dla.mil/online/start/);
   (2) Quick Search (http://quicksearch.dla.mil/);
   (3) ASSISTdocs.com (http://assistdocs.com).

(b) Documents not available from ASSIST may be ordered from the
Department of Defense Single Stock Point (DoDSSP) by-
   (1) Using the ASSIST Shopping Wizard
       (https://assist.dla.mil/wizard/index.cfm);
   (2) Phoning the DoDSSP Customer Service Desk (215) 697-2179,
       Mon-Fri, 0730 to 1600 EST; or
   (3) Ordering from DoDSSP, Building 4, Section D, 700 Robbins
       Avenue, Philadelphia, PA 19111-5094, Telephone (215) 697-2667/2179,
       Facsimile (215) 697-1462.

(End of provision)
1.4 (FAR 52.215-1) INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (JAN 2017)

(a) Definitions. As used in this provision-
"Discussions" are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.
"In writing," "writing," or "written" means any worded or numbered expression that can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.
"Proposal modification" is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.
"Proposal revision" is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.
"Time," if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) Amendments to solicitations. If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) Submission, modification, revision, and withdrawal of proposals.
(1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.
(2) The first page of the proposal must show-
(i) The solicitation number;
(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);
(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;
(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and
(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.
(3) Submission, modification, revision, and withdrawal of proposals.

(i) Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.
(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact
time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and-

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall-
(1) Mark the title page with the following legend:
This proposal includes data that shall not be disclosed outside the
Government and shall not be duplicated, used, or disclosed-in whole or in
part-for any purpose other than to evaluate this proposal. If, however, a
contract is awarded to this offeror as a result of-or in connection
with-the submission of this data, the Government shall have the right to
duplicate, use, or disclose the data to the extent provided in the
resulting contract. This restriction does not limit the Government's right
to use information contained in this data if it is obtained from another
source without restriction. The data subject to this restriction are
contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the
following legend:
Use or disclosure of data contained on this sheet is subject to the
restriction on the title page of this proposal.

(f) Contract award. (1) The Government intends to award a contract or
contracts resulting from this solicitation to the responsible offeror(s)
whose proposal(s) represents the best value after evaluation in accordance
with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such
action is in the Government's interest.

(3) The Government may waive informalities and minor
irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a
contract without discussions with offerors (except clarifications as
defined in FAR 15.306(a)). Therefore, the offeror's initial proposal
should contain the offeror's best terms from a cost or price and technical
standpoint. The Government reserves the right to conduct discussions if
the Contracting Officer later determines them to be necessary. If the
Contracting Officer determines that the number of proposals that would
otherwise be in the competitive range exceeds the number at which an
efficient competition can be conducted, the Contracting Officer may limit
the number of proposals in the competitive range to the greatest number
that will permit an efficient competition among the most highly rated
proposals.

(5) The Government reserves the right to make an award on any
item for a quantity less than the quantity offered, at the unit cost or
prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards
if, after considering the additional administrative costs, it is in the
Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not
constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is
unacceptable if the prices proposed are materially unbalanced between line
items or subline items. Unbalanced pricing exists when, despite an
acceptable total evaluated price, the price of one or more line items is
significantly overstated or understated as indicated by the application of
cost or price analysis techniques. A proposal may be rejected if the
Contracting Officer determines that the lack of balance poses an
unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may
be considered by the source selection authority in evaluating performance
or schedule risk.

(10) A written award or acceptance of proposal mailed or
otherwise furnished to the successful offeror within the time specified in
the proposal shall result in a binding contract without further action by
either party.

(11) If a post-award debriefing is given to requesting
offerors, the Government shall disclose the following information, if applicable:

(i) The agency's evaluation of the significant weak or deficient factors in the debriefed offeror's offer.

(ii) The overall evaluated cost or price and technical rating of the successful and the debriefed offeror and past performance information on the debriefed offeror.

(iii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection.

(iv) A summary of the rationale for award.

(v) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(vi) Reasonable responses to relevant questions posed by the debriefed offeror as to whether source-selection procedures set forth in the solicitation, applicable regulations, and other applicable authorities were followed by the agency.

(End of provision)

1.5 *FAR 52.225-12 NOTICE OF BUY AMERICAN REQUIREMENT-CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2014)

(a) Definitions. "Commercially available off-the-shelf (COTS) item," "construction material," "designated country construction material," "domestic construction material," and "foreign construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American-Construction Materials Under Trade Agreements" (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) Requests for determination of inapplicability. An offeror requesting a determination regarding the inapplicability of the Buy American statute should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American statute before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American statute, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) Alternate offers.

(1) When an offer includes foreign construction material, other than designated country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic or designated country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of
any foreign construction material for which the Government has not yet
determined an exception applies.

(3) If the Government determines that a particular exception
requested in accordance with paragraph (c) of FAR clause 52.225-11 does not
apply, the Government will evaluate only those offers based on use of the
equivalent domestic or designated country construction material, and the
offeror shall be required to furnish such domestic or designated country
construction material. An offer based on use of the foreign construction
material for which an exception was requested-

(i) Will be rejected as nonresponsive if this acquisition
is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.
(End of provision)

1.6 FAR 52. 215-20 REQUIREMENTS FOR CERTIFIED COST OR PRICING DATA AND
DATA OTHER THAN CERTIFIED COST OR PRICING DATA (OCT 2010)

(a) Exceptions from certified cost or pricing data.

(1) In lieu of submitting certified cost or pricing data, offerors may
submit a written request for exception by submitting the information
described in the following paragraphs. The Contracting Officer may require
additional supporting information, but only to the extent necessary to
determine whether an exception should be granted, and whether the price is
fair and reasonable.

(i) Identification of the law or regulation establishing the price offered.
If the price is controlled under law by periodic rulings, reviews, or
similar actions of a governmental body, attach a copy of the controlling
document, unless it was previously submitted to the contracting office.

(ii) Commercial item exception. For a commercial item exception, the
offeror shall submit, at a minimum, information on prices at which the same
item or similar items have previously been sold in the commercial market
that is adequate for evaluating the reasonableness of the price for this
acquisition. Such information may include-

(A) For catalog items, a copy of or identification of the catalog and its
date, or the appropriate pages for the offered items, or a statement that
the catalog is on file in the buying office to which the proposal is being
submitted. Provide a copy or describe current discount policies and price
lists (published or unpublished), e.g., wholesale, original equipment
manufacturer, or reseller. Also explain the basis of each offered price and
its relationship to the established catalog price, including how the
proposed price relates to the price of recent sales in quantities similar
to the proposed quantities;

(B) For market-priced items, the source and date or period of the market
quotation or other basis for market price, the base amount, and applicable
discounts. In addition, describe the nature of the market;

(C) For items included on an active Federal Supply Service Multiple Award
Schedule contract, proof that an exception has been granted for the
schedule item.

(2) The offeror grants the Contracting Officer or an authorized
representative the right to examine, at any time before award, books,
records, documents, or other directly pertinent records to verify any
request for an exception under this provision, and the reasonableness of
price. For items priced using catalog or market prices, or law or regulation, access does not extend to cost or profit information or other data relevant solely to the offeror's determination of the prices to be offered in the catalog or marketplace.

(b) Requirements for certified cost or pricing data. If the offeror is not granted an exception from the requirement to submit certified cost or pricing data, the following applies:

(1) The offeror shall prepare and submit certified cost or pricing data, data other than certified cost or pricing data, and supporting attachments in accordance with the instructions contained in Table 15-2 of FAR 15.408, which is incorporated by reference with the same force and effect as though it were inserted here in full text. The instructions in Table 15-2 are incorporated as a mandatory format to be used in this contract, unless the Contracting Officer and the Contractor agree to a different format and change this clause to use Alternate I.

(2) As soon as practicable after agreement on price, but before contract award (except for unpriced actions such as letter contracts), the offeror shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

(End of provision)

1.7 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984)
The Government contemplates award of a firm fixed price contract resulting from this solicitation.

(End of provision)

1.8 (FAR 52.217-5) EVALUATION OF OPTIONS (JUL 1990)
Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

(End of provision)

1.9 FAR 52.222-5 CONSTRUCTION WAGE RATE REQUIREMENTS-SECONDARY SITE OF THE WORK (MAY 2014)

(a)(1) The offeror shall notify the Government if the offeror intends to perform work at any secondary site of the work, as defined in paragraph (a)(1)(ii) of the FAR clause at 52.222-6, Construction Wage Rate Requirements, of this solicitation.

(2) If the offeror is unsure if a planned work site satisfies the criteria for a secondary site of the work, the offeror shall request a determination from the Contracting Officer.

(b)(1) If the wage determination provided by the Government for work at the primary site of the work is not applicable to the secondary site of the work, the offeror shall request a wage determination from the Contracting Officer.

(2) The due date for receipt of offers will not be extended as a result of an offeror's request for a wage determination for a secondary site of the work.

(End of provision)
1.10 FAR 52.222-58 SUBCONTRACTOR RESPONSIBILITY MATTERS REGARDING COMPLIANCE WITH LABOR LAWS (EXECUTIVE ORDER 13673) (DEC 2016)

(a) "Administrative merits determination", "arbitral award or decision", "civil judgment", "DOL Guidance", "enforcement agency", "labor compliance agreement", "labor laws", and "labor law decision" as used in this provision have the meaning given in the clause in this solicitation entitled 52.222-59, Compliance with Labor Laws (Executive Order 13673).

(b) Subcontractor representation. (1) The requirements of this provision apply to all prospective subcontractors at any tier submitting an offer for subcontracts where the estimated subcontract value exceeds $500,000 for other than commercially available off-the-shelf items. The Offeror shall require these prospective subcontractors to represent, to the Offeror, to the best of the subcontractor's knowledge and belief, whether there have been any administrative merits determinations, arbitral awards or decisions, or civil judgments for any labor law violation(s) rendered against the prospective subcontractor during the period beginning October 25, 2015 to the date of the offer, or for three years preceding the offer, whichever period is shorter.

(2) A contractor or subcontractor, acting in good faith, is not liable for misrepresentations made by its subcontractors about labor law decisions or about labor compliance agreements.

(c) Subcontractor responsibility determination. If the prospective subcontractor responded affirmatively to paragraph (b) of this provision and the Offeror initiates a responsibility determination, the Offeror shall follow the procedures in paragraph (c) of 52.222-59, Compliance with Labor Laws (Executive Order 13673).

Note to 52.222-58: By a court order issued on October 24, 2016, 52.222-58 is enjoined indefinitely as of the date of the order. The enjoined section will become effective immediately if the court terminates the injunction. At that time, GSA, DoD and NASA will publish a document in the Federal Register advising the public of the termination of the injunction.

(End of provision)

1.11 *FAR 52.225-12 NOTICE OF BUY AMERICAN REQUIREMENT-CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (MAY 2014)

(a) Definitions. "Commercially available off-the-shelf (COTS) item," "construction material," "designated country construction material," "domestic construction material," and "foreign construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American-Construction Materials Under Trade Agreements" (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) Requests for determination of inapplicability. An offeror requesting a determination regarding the inapplicability of the Buy American statute should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American statute before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American statute, based on claimed unreasonable cost of domestic construction materials, by adding
to the offered price the appropriate percentage of the cost of such foreign
construction material, as specified in paragraph (b)(4)(i) of FAR clause
52.225-11.

(2) If evaluation results in a tie between an offeror that
requested the substitution of foreign construction material based on
unreasonable cost and an offeror that did not request an exception, the
Contracting Officer will award to the offeror that did not request an
exception based on unreasonable cost.

(d) Alternate offers.

(1) When an offer includes foreign construction material, other
than designated country construction material, that is not listed by the
Government in this solicitation in paragraph (b)(3) of FAR clause
52.225-11, the offeror also may submit an alternate offer based on use of
equivalent domestic or designated country construction material.

(2) If an alternate offer is submitted, the offeror shall
submit a separate Standard Form 1442 for the alternate offer, and a
separate price comparison table prepared in accordance with paragraphs (c)
and (d) of FAR clause 52.225-11 for the offer that is based on the use of
any foreign construction material for which the Government has not yet
determined an exception applies.

(3) If the Government determines that a particular exception
requested in accordance with paragraph (c) of FAR clause 52.225-11 does not
apply, the Government will evaluate only those offers based on use of the
equivalent domestic or designated country construction material, and the
offeror shall be required to furnish such domestic or designated country
construction material. An offer based on use of the foreign construction
material for which an exception was requested-

(i) Will be rejected as nonresponsive if this acquisition
is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of provision)

1.12 (FAR 52.232-18) AVAILABILITY OF FUNDS (APR 1984)

Funds are not presently available for this contract. The Government's
obligation under this contract is contingent upon the availability of
appropriated funds from which payment for contract purposes can be made.
No legal liability on the part of the Government for any payment may arise
until funds are made available to the Contracting Officer for this contract
and until the Contractor receives notice of such availability, to be
confirmed in writing by the Contracting Officer.

(End of clause)

1.13 (FAR 52.233-2) SERVICE OF PROTEST (SEPT 2006)

(a) Protests, as defined in section 33.101 of the Federal
Acquisition Regulation, that are filed directly with an agency, and copies
of any protests that are filed with the Government Accountability Office
(GAO), shall be served on the Contracting Officer (addressed as follows) by
obtaining written and dated acknowledgment of receipt from District
Counsel, 1616 Capitol Avenue, Omaha, Nebraska 68102-4901.

(b) The copy of any protest shall be received in the office
designated above within one day of filing a protest with the GAO.

(End of provision)

1.14 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3,
Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) The Government intends to hold a site visit on 23 AUG 2017, at 1300 hours (1:00 p.m.) Mountain Time. The meeting will be held at Building 1005. For Additional details, contact:

Neal Parker
Neal.M.Parker@usace.army.mil
303-249-0310

(End of provision)

1.15 (FAR 52.252-1) SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://acquisition.gov/comp/far/index.html
http://www.acq.osd.mil/dpap/

(End of provision)

1.16 (DFARS 252.204-7004) ALTERNATE A, SYSTEM FOR AWARD MANAGEMENT (FEB 2014)

As prescribed in 204.1105, substitute the following paragraph (a) for paragraph (a) of the provision at FAR 52.204-7:

(a) Definitions. As used in this provision—

“System for Award Management (SAM) database” means the primary Government repository for contractor information required for the conduct of business with the Government.

“Commercial and Government Entity (CAGE) code” means—

(1) A code assigned by the Defense Logistics Information Service (DLIS) to identify a commercial or Government entity; or

(2) A code assigned by a member of the North Atlantic Treaty Organization that DLIS records and maintains in the CAGE master file. This type of code is known as an “NCAGE code.”

“Data Universal Numbering System (DUNS) number” means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

“Data Universal Numbering System +4 (DUNS+4) number” means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a
business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional SAM records for identifying alternative Electronic Funds Transfer (EFT) accounts (see FAR 32.11) for the same parent concern.

"Registered in the System for Award Management (SAM) database" means that—

(1) The contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, and Contractor and Government Entity (CAGE) code into the SAM database; and

(2) The contractor has completed the Core Data, Assertions, Representations and Certifications, and Points of Contact sections of the registration in the SAM database;

(3) The Government has validated all mandatory data fields, to include validation of the Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS). The Contractor will be required to provide consent for TIN validation to the Government as part of the SAM registration process; and

(4) The Government has marked the record "Active."

1.17 (DFARS 252.204-7008) COMPLIANCE WITH SAFEGUARDING COVERED DEFENSE INFORMATION CONTROLS (OCT 2016)

(a) Definitions. As used in this provision—

"Controlled technical information," "covered contractor information system," covered defense information, cyber incident, information system, and technical information are defined in clause 252.204-7012, Safeguarding Covered Defense Information and Cyber Incident Reporting.

(b) The security requirements required by contract clause 252.204-7012 shall be implemented for all covered defense information on all covered contractor information systems that support the performance of this contract.

(c) For covered contractor information systems that are not part of an information technology service or system operated on behalf of the Government (see 252.204-7012(b)(2))—

(1) By submission of this offer, the Offeror represents that it will implement the security requirements specified by National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171, "Protecting Controlled Unclassified Information in Nonfederal Information Systems and Organizations" (see http://dx.doi.org/10.6028/NIST.SP.800-171) that are in effect at the time the solicitation is issued or as authorized by the contracting officer, not later than December 31, 2017.

(2)(i) If the Offeror proposes to vary from any of the security requirements specified by NIST SP 800-171 that are in effect at the time the solicitation is issued or as authorized by the Contracting Officer, the Offeror shall submit to the Contracting Officer, for consideration by the DoD Chief Information Officer (CIO), a written explanation of—

(A) Why a particular security requirement is not applicable; or
(B) How an alternative but equally effective, security measure is used to compensate for the inability to satisfy a particular requirement and achieve equivalent protection.

(ii) An authorized representative of the DoD CIO will adjudicate offeror requests to vary from NIST SP 800-171 requirements in writing prior to contract award. Any accepted variance from NIST SP 800-171 shall be incorporated into the resulting contract.

(End of provision)

1.18 (DFARS 252.215-7008) ONLY ONE OFFER (OCT 2013)

(a) After initial submission of offers, the Offeror agrees to submit any subsequently requested additional cost or pricing data if the Contracting Officer notifies the offeror that—

(1) Only one offer was received; and

(2) Additional cost or pricing data is required in order to determine whether the price is fair and reasonable or to comply with the statutory requirement for certified cost or pricing data (10 U.S.C. 2306a and FAR 15.403-3).

(b) Requirement for submission of additional cost or pricing data. Except as provided in paragraph (c) of this provision, the Offeror shall submit additional cost or pricing data as follows:

(1) If the Contracting Officer notifies the Offeror that additional cost or pricing data are required in accordance with paragraph (a) of this clause, the data shall be certified unless an exception applies (FAR 15.403-1(b)).

(2) Exceptions from certified cost or pricing data. In lieu of submitting certified cost or pricing data, the Offeror may submit a written request for exception by submitting the information described in the following paragraphs. The Contracting Officer may require additional supporting information, but only to the extent necessary to determine whether an exception should be granted, and whether the price is fair and reasonable.

(i) Identification of the law or regulation establishing the price offered. If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.

(ii) Commercial item exception. For a commercial item exception, the Offeror shall submit, at a minimum, information on prices at which the same item or/ similar items have previously been sold in the commercial market that is adequate for evaluating the reasonableness of the price for this acquisition. Such information may include—

(A) For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar
to the proposed quantities;

(B) For market-priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market; or

(C) For items included on an active Federal Supply Service Multiple Award Schedule contract, proof that an exception has been granted for the schedule item.

(3) The Offeror grants the Contracting Officer or an authorized representative the right to examine, at any time before award, books, records, documents, or other directly pertinent records to verify any request for an exception under this provision, and the reasonableness of price. For items priced using catalog or market prices, or law or regulation, access does not extend to cost or profit information or other data relevant solely to the Offeror’s determination of the prices to be offered in the catalog or marketplace.

(4) Requirements for certified cost or pricing data. If the Offeror is not granted an exception from the requirement to submit certified cost or pricing data, the following applies:

(i) The Offeror shall prepare and submit certified cost or pricing data and supporting attachments in accordance with the instructions contained in Table 15-2 of FAR 15.408, which is incorporated by reference with the same force and effect as though it were inserted here in full text. The instructions in Table 15-2 are incorporated as a mandatory format to be used, unless the Contracting Officer and the Offeror agree to a different format.

(ii) As soon as practicable after agreement on price, but before contract award (except for unpriced actions such as letter contracts), the offeror shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

(c) If the Offeror is the Canadian Commercial Corporation, certified cost or pricing data are not required. If the Contracting Officer notifies the Canadian Commercial Corporation that additional data other than certified cost or pricing data are required in accordance with 225.870-4(c), the Canadian Commercial Corporation shall obtain and provide the following:

(1) Profit rate or fee (as applicable).

(2) Analysis provided by Public Works and Government Services Canada to the Canadian Commercial Corporation to determine a fair and reasonable price (comparable to the analysis required at FAR 15.404-1).

(3) Data other than certified cost or pricing data necessary to permit a determination by the U.S. Contracting Officer that the proposed price is fair and reasonable [U.S. Contracting Officer to provide description of the data required in accordance with FAR 15.403-3(a)(1) with the notification].

(4) As specified in FAR 15.403-3(a)(4), an offeror who does not comply with a requirement to submit data that the U.S. Contracting Officer has deemed necessary to determine price reasonableness or cost realism is ineligible for award unless the head of the contracting activity determines that it is in the best interest of the Government to make the award to that offeror.
(d) If negotiations are conducted, the negotiated price should not exceed the offered price.
(End of provision)

1.19  DEFINITION OF "DESIGN-BUILD" PROCESS

The "Design-Build Process is the procurement of a facility utilizing a Request for Proposal (RFP) to solicit for the design and construction of a facility by a single contractual entity. The contractual entity may be a "Design-Build" firm, or joint venture between an architect-engineer (A-E) and construction firm, or a construction management (CM) firm joint venture with an A-E and a construction firm.

1.20  SOLICITATION RESTRICTIONS

1.20.1  GENERAL CONTRACTOR

This solicitation is unrestricted and open to both large and small business participation.

1.20.2  ESTIMATED DESIGN AND CONSTRUCTION COST

The estimated design and construction cost of this project is between $10,000,000 and $15,000,000.

1.20.3  SUBMISSION, MODIFICATION, REVISION, AND WITHDRAWAL OF PROPOSALS

See FAR 52.215-1 INSTRUCTIONS TO OFFERORS-COMPETITIVE ACQUISTION, subparagraph "(c) Submission, modification, revision, and withdrawal of proposals." below for acceptable methods. Note: Electronic commerce or facsimile are not acceptable methods, unless indicated otherwise.

1.20.4  SUBMISSION DEADLINE

Offers shall be submitted at the location stated and by the time and date as specified in Section 00 10 00, Page 1.

Due to heightened security at Government installations, those offerors who have their proposals hand-carried* shall contact Katherine Fisher, Contract Specialist at (402) 995-2102 prior to delivering to the U.S. Army Corps of Engineer District, Omaha, 1616 Capitol Ave, Omaha, NE 68102-4901.

On the date specified and for thirty (30) minutes prior to the specified time, a Contracting representative will be in the lobby to receive proposals. Containers (i.e. envelopes, packages, boxes) will be screened for security purposes. Hand-carried means the individual must be able to carry on their person. If due to size or volume, packages or boxes need to be wheeled in on a cart or dolly, you will be required to go to the dock area located on the northeast side of the facility. After inspection and screening, you will be allowed in the building after presenting valid photo identification. At the time specified in Section 00 10 00, Page 1, local time, it will be announced that receipt of proposals is closed. Official time will be established by time/stamp clock designated by the Contract Specialist.
*This instruction shall also apply to those proposals delivered through a delivery or parcel service.

NOTE: No parking on the street in front of the facility entrances will be allowed. Passenger vehicles will need to locate parking meters or parking garages before delivering proposals. Delivery trucks must go to the dock. The vehicle will be inspected and packages screened at the dock. After inspection and screening, the delivery person will be allowed into the building.

1.20.5 RETURN ADDRESS REQUIREMENTS

Offeror(s) must ensure that ALL mail sent to the Omaha District, U.S. Army Corps of Engineers, either pre-contract or post-contract award, has a return mailing address on the outside of the envelope, package, box, etc. ANY MAIL addressed to the U.S. Army Corps of Engineers, including but not limited to bids, modifications to bids, proposals, revised proposals, bid guarantees, bonds, correspondence, etc., will be REJECTED by the US Army Corps of Engineers mail room facility located at 1616 Capitol Avenue, Omaha, Nebraska 68102-4901 if it does not contain a return mailing address. THERE WILL BE NO EXCEPTIONS.

1.20.6 CADD AND ELECTRONIC DESIGN FILES (PROVIDED)
If provided, the CADD survey files and other electronic design files are provided on an as-is basis. Any Government provided survey, and the other electronic design files are provided to assist the Contractor in preparing their proposal using their own commercially purchased software. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided and shall assume all liability from the use of these files. The Contractor shall be responsible for obtaining any other software necessary to view the files provided. No other CADD design files will be provided for proposal preparation other than those provided at the time of RFP issuance. No assistance with the files will be provided.

1.21 COPIES OF SOLICITATION DOCUMENT AND AMENDMENTS

Copies of the solicitation and amendments are available by INTERNET ACCESS ONLY. All solicitation documents will be posted to the Federal Business Opportunities website at:

https://www.fbo.gov/spg/USA/COE/DACA45/W9128F-17-R-0073/listing.html

It shall be the Contractor's responsibility to check the websites for any amendments. The offeror shall submit in the proposal all requested information specified in this solicitation. There will be no public opening of the proposals received as a result of this solicitation. A list of interested vendors (potential offerors and subcontractors) is available on the federal business opportunities web site listed above (registration required).

1.22 OFFEROR'S QUESTIONS AND COMMENTS
Questions and/or comments relative to these bidding (proposal) documents should be submitted via Bidder Inquiry as indicated below. See instructions on when e-mail or mailing is appropriate. Mailing address is shown on the Standard Form SF 1442, Item 8, unless directed otherwise.

Questions and/or comments relative to these bidding (proposal) documents
that is proprietary in nature or if Bidder Inquiry system (See Below) is out of service should be submitted to the Contract Specialist:

Contract Specialist - Primary POC:
Katherine Fisher
Katherine.K.Fisher@usace.army.mil
402-995-2102 (Telephone)
402-995-2081 (Fax)

1.22.1 BIDDER INQUIRY

Technical inquiries and questions relating to technical requirements, proposal procedures or bonds are to be submitted via Bidder Inquiry in ProjNet at: https://www.projnet.org/projnet/ No Later Than ten (10) calendar days before due date of proposals, in order that they may be given consideration or actions taken prior to receipt of offers. Phone calls for non-technical or procedural type questions should be made between 8:30 a.m. and 3:30 p.m. (Central Standard Time) Monday through Friday. The Bidder Inquiry system is to be used to ask and receive answers to all non-proprietary questions.

To submit and review inquiry items, prospective vendors will need to use the Bidder Inquiry Key presented below and follow the instructions listed below. A prospective vendor who submits a comment/question will receive an acknowledgement of their comment/question via email, followed by an answer to the comment/question after it has been processed by our technical team.

All timely questions and approved answers will be made available through ProjNet.

The Solicitation Number is: W9128F-17-R-0073

The Bidder Inquiry Key is: 2MAHGJ-P33N85

a. Registration for ProjNet Bidder Inquiry Access

If you are already registered, go to Entering Bidder Inquiries in ProjNet Bidder Inquiry System below.

1. From the ProjNet home page linked above, click on Quick Add on the upper right side of the screen.

2. Identify the Agency. This should be marked as USACE.

3. Key. Enter the Bidder Inquiry Key listed above.

4. Email. Enter the email address you would like to use for communication.

5. Click Continue. A page will then open saying that a user account was not found and will ask you to create one using the provided form.

6. Enter your First Name, Last Name, Company, City, State, Phone, Email, Secret Question, Secret Answer, and Time Zone. Make sure to remember your Secret Question and Answer as they will be used from this point on to access the ProjNet system.
7. Click Add User. Once this is completed you are now registered within ProjNet and are currently logged into the system.

b. Entering Bidder Inquiries in ProjNet Bidder Inquiry System

1. For future access to ProjNet, you will not be emailed any type of password. You will utilize your Secret Question and Secret Answer to log in.

2. From the ProjNet home page linked above, click on Quick Add on the upper right side of the screen.

3. Identify the Agency. This should be marked as USACE.

4. Key. Enter the Bidder Inquiry Key listed above.

5. Email. Enter the email address you used to register previously in ProjNet.

6. Click Continue. A page will then open asking you to enter the answer to your Secret Question.

7. Enter your Secret Answer and click Login. Once this is completed you are now logged into the system.

8. Follow online screen instructions to enter specific bidder inquiries for the project.

c. The Bidder Inquiry System will be unavailable for new inquires after ten (10) calendar days in order to ensure adequate time is allotted to form an appropriate response and amend the solicitation, if necessary.

d. Offerors are requested to review the specification in its entirety, review the Bidder Inquiry System for answers to questions prior to submission of a new inquiry.

e. The call center operates weekdays from 8AM to 5PM U.S. Central Time Zone (Chicago). The telephone number for the Call Center is 800-428-HELP.

f. Offers will NOT be publicly opened. Information concerning the status of the evaluation and/or award will NOT be available after receipt of proposals.

1.22.2 PLAN HOLDER'S LIST

For Viewing a List of Interested Vendors (i.e. planholders List) and Receiving Notifications or e-mail of changes regarding a solicitation, Federal Business Opportunities has these features available (https://www.fbo.gov/). For this solicitation, go to https://www.fbo.gov/ and register as a vendor or enter user name and password to login. If you wish for General Contractors, Subcontractors, Suppliers, Plan Rooms or Print Shops to have the ability to contact you, click on the "Add me to Interested Vendors" for the solicitation.

1.23 GENERAL DESCRIPTION OF WORK

Scope of project includes all work required to design and construct an Indoor Small Arms Firing Range located at Buckley AFB, Colorado. Work
shall be in accordance with Request for Proposal documents issued with this solicitation.

1.24 PROPOSAL SUBMISSION REQUIREMENTS, EVALUATION AND CONTRACT AWARD

See Section 00 22 00 SUPPLEMENTARY INSTRUCTIONS, PROPOSAL SUBMISSION AND EVALUATION.

1.25 SOURCE SELECTION BOARD (SSB)

The Contracting Officer has established a Source Selection Board to conduct an evaluation of each proposal received in response to this Solicitation. The evaluation will be based exclusively on the merits and content of the proposal and any subsequent discussion required. The identities of the SSB personnel are confidential, and any attempt by the proposers to contact these individuals is prohibited.

1.26 FEDERAL, STATE AND LOCAL TAXES

It is the Contractor's responsibility to investigate applicable federal, state and local taxes and any specific exemptions that may exist. This includes any applicable Value-Added Taxes (VAT), sales, use, and excise taxes. See General Conditions (Contract Clause) 52.229-3 FEDERAL, STATE AND LOCAL TAXES.

1.27 COLORADO SALES AND USE TAX

Specific exemption from the Colorado Sales and Use Taxes will be granted by the Colorado Tax authorities with respect to all materials used by a prime Contractor or subcontractor and which are built into structures furnished under contract to a Government agency. The Colorado Sales and Use Taxes shall be excluded from the proposal prices. Exemption certificates are available to both Contractors and subcontractors provided personal application is made therefore to the Colorado Department of Revenue (www.taxcolorado.com). The Contractor or subcontractor will be required to submit required information (i.e. the date of the contract, the amount of the contract, and the proposed date for completion of the contract). Telephone: (303) 238-7378 (General Information).

1.28 JOINT VENTURE AGREEMENTS

Joint Ventures are allowable on competitive 8(a) set-asides, however, a copy of the joint venture agreement must be received by the Small Business Administration (SBA) prior to the date of receiving proposals and approved before the award of any resulting contract. For 8(a) Contractors contemplating a joint venture on this project, advise SBA prior to date of receiving proposals. A proposal will be declared non-responsive for any joint ventures failing to meet this requirement.

1.29 SUBCONTRACTING PLAN/SUBCONTRACTING GOALS REGARDING THE UTILIZATION OF SMALL BUSINESS CONCERNS

a. Application. This provision applies only to large business concerns submitting bids for services exceeding $650,000 or for construction exceeding $1,500,000.

b. Federal Acquisition Regulations (FAR). Attention is directed to the following FAR and DFARS clauses contained in this solicitation:
c. Goals. The government considers the following goals reasonable and achievable during the performance of the contract resulting from this solicitation. At the Government's discretion, final goals may be negotiated prior to contract award. The Subcontracting Plan will then become a material part of the contract.

**Subcontracting Goals:**

i. 40.0% of planned subcontracting dollars can be placed with all small business concerns.

ii. 3.0% of planned subcontracting dollars can be placed with those small business concerns owned and controlled by socially and economically disadvantaged individuals or Historically Black Colleges and Universities or Minority Institutions. **NOTE:** ii. is a subset of i.

iii. 7.0% of planned subcontracting dollars for small women-owned businesses. **NOTE:** iii. is a subset of i. Also, the women-owned business may meet the definition of a small disadvantaged business. If so, iii. will also be a subset of ii. (Count firm in all applicable areas.)

iv. 1.0% of planned subcontracting dollars may be placed with HUBZone small business concerns. **NOTE:** iv. is a subset of i. Note: A HUBZone firm may also SDB, women-owned and/or veteran-owned. (Count firm in all applicable areas).

v. 2.0% of planned subcontracting dollars for veteran-owned small business. **NOTE:** v. is a subset of i. Go to http://www.sba.gov/aboutsba/sbapublications/ovbd/index.html for questions concerning the Veterans Business Development program.

vi. 3.0% of planned subcontracting dollars may be placed with service-disabled veteran-owned small business. **NOTE:** vi. is a subset of i. and v.

d. Submission and Review of Subcontracting Plan.

**SUBMISSION OF SMALL BUSINESS SUBCONTRACTING PLAN IS NOT APPLICABLE TO SMALL BUSINESSES.**

(1) Upon notification by the Contracting Officer, the apparent successful offeror must submit a subcontracting plan within one (1) calendar day after notification (a longer period maybe granted by the Contracting Officer).

(2) Goals included in the subcontracting plan should be at least equal to those indicated above. If lesser goals are proposed, the bidder may be required to substantiate how the proposed plan represents the bidder's best effort to comply with the terms and conditions of the solicitation. Bidders are highly encouraged to become familiar with
the intent of the solicitation provisions and the elements of the subcontracting plan.

(3) The subcontracting plan must contain, as a minimum, the elements set forth in FAR provision 52.219-9. An example subcontracting plan will be furnished to the apparent successful offeror (upon request). The example subcontracting plan (if requested) should not be construed as an acceptable subcontracting plan. Any format will be acceptable provided that the plan addresses each element as required by the Federal Acquisition Regulations and its supplements.

(4) Proposed plans will be reviewed by the Government to ensure the plan represents the firm's best efforts to maximize subcontracting opportunities for small, small disadvantaged and women-owned businesses.

(5) Subcontracting plans are required to be approved prior to Contract Award. The approved subcontracting plan (to include goals) will become a material part of the contract.

e. Failing to Submit an Acceptable Subcontracting Plan. An apparent successful offeror failing to submit a subcontracting plan which demonstrates a reasonable effort to meet the goals listed above or provide an explanation why lesser goals are proposed (upon request), will be considered as non-responsive and not considered eligible for award of the contract.

f. Questions or Assistance Needed in Developing Subcontracting Plan. For any questions or assistance needed in developing the subcontracting plan, contact the Contract Specialist or District's Deputy for Small Business (See paragraph: BIDDER QUESTIONS AND COMMENTS. Please contact the Contract Specialist listed or the District's Deputy for Small Business or fax your inquiries to 402-995-2013).

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --
SECTION 00 22 00 PROPOSAL SUBMISSION REQUIREMENTS, EVALUATION CRITERIA AND BASIS OF AWARD

1.0 OVERVIEW

2.0 BASIS OF AWARD

3.0 GENERAL INSTRUCTIONS

4.0 PROPOSAL INFORMATION AND RELATED EVALUATION FACTORS AND SUBFACTORS

4.1. VOLUME 1 – TECHNICAL AND SMALL BUSINESS UTILIZATION

4.2. VOLUME 2 – PAST PERFORMANCE

4.3. VOLUME 3 – PRICE AND PRO-FORMA INFORMATION

5.0 VOLUME 1 – FACTOR 1 – TECHNICAL

5.1. TAB A – SUBFACTOR 1 – SPECIALIZED EXPERIENCE

5.2. TAB B – SUBFACTOR 2 – PROJECT MANAGEMENT PLAN

5.3. TAB C – SUBFACTOR 3 – KEY PERSONNEL CAPABILITIES AND EXPERIENCE

5.4. TAB D – SUBFACTOR 4 – SMALL BUSINESS PARTICIPATION PLAN

6.0 VOLUME 2 – FACTOR 2 – PAST PERFORMANCE

6.1. TAB A - FACTOR 2 – PAST PERFORMANCE

7.0 VOLUME 3 – PRICE AND PRO-FORMA INFORMATION

7.1. GENERAL

7.2. TAB A – FACTOR 3 – PRICE (STANDARD FORM 1442, PROPOSAL DATA SHEET AND CONTRACT LINE ITEM SCHEDULE)

7.3. TAB B – EVIDENCE OF BONDABILITY

7.4. TAB C – REQUIRED PRE-AWARD INFORMATION

7.5. TAB D – SUBCONTRACTING PLAN

8.0 EVALUATION PROCEDURES

8.1. SOURCE SELECTION EVALUATION BOARD (SSEB)

8.2. EVALUATION

8.3. DEFINITIONS

8.4. EVALUATION RATING SYSTEM

8.5. PAST PERFORMANCE CONFIDENCE ASSESSMENT RATING SYSTEM
ATTACHMENTS

1 - COMPANY SPECIALIZED EXPERIENCE CONSTRUCTION OR PRIME CONTRACTOR
2 - COMPANY SPECIALIZED EXPERIENCE DESIGN FIRM OR IN-HOUSE DESIGN CAPABILITY
3 - COMPANY SPECIALIZED EXPERIENCE KEY SUBCONTRACTOR (OR PRIME IF WORK NOT TO BE SUBCONTRACTED)
4 - PAST PERFORMANCE EVALUATION TELEPHONE INTERVIEW QUESTIONNAIRE
5 - KEY PERSONNEL RESUME
6 - LETTER OF COMMITMENT FOR KEY PERSONNEL
7 - LETTER OF COMMITMENT FOR (DESIGN FIRM OR KEY SUBCONTRACTOR)
8 - PROPOSAL DATA SHEETS
1.0 OVERVIEW

1.1. This is a “Best Value” solicitation for the Design and Construction of Small Arms Indoor Firing Range at Buckley AFB, Aurora, CO. The Government will evaluate the proposals in accordance with the criteria described herein, and award a firm-fixed-price contract to the responsible offeror whose proposal conforms with all the terms and conditions of the solicitation and whose proposal is determined to represent the overall best value to the Government.

1.2. PROPOSAL FORMAT

The Packaging that contains the Proposals shall be sealed and marked:

“Proposals for Solicitation No. W9128F-17-R-0073, to be opened by Contracting Personnel Only”

Written materials:  8 ½” x 11” format in bound volumes using 10 point or larger font size and using 3-ring binders. Combine Volumes 1 and 2 into a single binder. For each binder, provide a title sheet on the cover, table of contents and labeled tabs matching this document’s Table of Contents. Provide a title sheet within each volume identifying the prime, consortium, or joint venture’s name, address, telephone, fax and email address and point of contact. Include the signature, title and contact information of the official that can bind the firm.

Volume number and tab section submitted shall appear in the bottom right corner of each page (along with the revision number and revision date for the amended page, if necessary)

Number of copies: Submit only one original and one copy of Volume 1 and 2 (in a single/shared binder) as well as one CD in read-only format, using .PDF files. Submit Volume 3 in a sealed envelope as well as one CD (with only Volume 3). It is imperative that none of the pricing or Volume 3 information show up in Volumes 1 or 2. The offeror has the option of excluding an electronic copy of only Section 00 10 00 (SF 1442 and CLIN Pricing Schedule) from the CDs and submitting it only in hard copy format. The CDs shall contain the balance of the printed materials electronically in PDF file format.

2.0 BASIS OF AWARD

2.1. The Contracting Officer will award a firm-fixed-price contract to that responsible Offeror whose proposal the Source Selection Authority has determined conforms to the solicitation, is fair and reasonable, and offers the best overall value to the Government, considering all non-price factors described herein, and price. **All evaluation factors, other than price, when combined, are considered significantly more important than price; however, the Contract award should not exceed the cost limitation described in Section 00 21 01 for this project.** The intent of this solicitation is to obtain the best proposal within the cost limitation. There is no obligation to approach or match the cost limitation in the offer. After the Government individually evaluates and rates each proposal, the Contracting Officer/Source Selection Authority will compare proposals to determine which proposal represents the best value. The Government reserves the right to accept other than the lowest priced offer or to reject all offers. The Government will not award a contract to an Offeror whose proposal contains a deficiency, as defined in FAR 15.001. If there is a lower priced, conforming offer(s), the Contracting Officer/Source Selection Official must determine that the added value of a more expensive proposal (within the cost limitation) would justify award to that offeror.

3.0 GENERAL INSTRUCTIONS

3.1. Proposals should be submitted initially on the most favorable terms from a price and technical standpoint. Do not assume that offerors will be contacted or afforded an opportunity to clarify, discuss or revise their proposals.

3.2. The proposal shall describe the capability of the Offeror to perform the requirements of the RFP. The proposal should be specific and complete in every detail and should be prepared simply and
economically, providing a straightforward and concise description of capabilities to satisfactorily perform the requirements. The proposal should be practical, legible, clear, and coherent.

3.3. In order to effectively and equitably evaluate all proposals, the Contracting Officer must receive information containing sufficient detail to allow review and evaluation by the Government. Proposal clarity, organization, and cross-referencing are mandatory. Failure to submit and organize proposals as requested may adversely affect an Offeror’s evaluation.

3.4. Firms formally organized as design-build entities, design firms and construction contractors that have associated specifically for this project, consortia of firms or any other interested parties may submit proposals. Associations may be as joint ventures or as key team subcontractors. Any legally organized Offeror may submit a proposal, provided that the Offeror or Offeror’s subcontractor has or will have professional architects and engineers, registered in the appropriate technical disciplines and provided that the requirements specified in Contract clause, “Requirements for Registration of Designers”, are met. All designs must be under the direct supervision of appropriately licensed professionals for each discipline involved.

3.5. Submit proposals in tabbed, three-ring binders per paragraph 1.2 above. Note that the Government will not evaluate any material that exceeds the page limits, where indicated below.

4.0 PROPOSAL INFORMATION AND RELATED EVALUATION FACTORS AND SUBFACTORS

4.1. VOLUME 1 – TECHNICAL AND SMALL BUSINESS UTILIZATION

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<tr>
<th>Factor/Sub Factor</th>
<th>Location</th>
<th>Description</th>
<th>Relative Importance</th>
</tr>
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<tr>
<td>Subfactor 1</td>
<td>Vol. 1 TAB A</td>
<td>Specialized Experience</td>
<td>Most Important Subfactor</td>
</tr>
<tr>
<td>Subfactor 2</td>
<td>Vol. 1 TAB B</td>
<td>Project Management Plan</td>
<td>Second most Important Subfactor</td>
</tr>
<tr>
<td>Subfactor 3</td>
<td>Vol. 1 TAB C</td>
<td>Key Personnel Capabilities and Experience</td>
<td>3rd most Important Subfactor (significantly less important than Subfactor 2)</td>
</tr>
<tr>
<td>Subfactor 4</td>
<td>Vol. 1 TAB D</td>
<td>Small Business Participation Plan</td>
<td>4th most Important Subfactor (significantly less important than Subfactor 3)</td>
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4.2. VOLUME 2 – PAST PERFORMANCE

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</thead>
<tbody>
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<td>FACTOR 2</td>
<td>Vol. 2 TAB A</td>
<td>Past Performance</td>
<td>Factor 1 is slightly more important than Factor 2. All evaluation factors other than cost or price, when combined are significantly more important than cost or price (Factor 3).</td>
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<tr>
<td>N/A</td>
<td>Relevancy</td>
<td>Used in determining rating for Factor 2</td>
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<tr>
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<td>Confidence</td>
<td>Used in determining rating for Factor 2</td>
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4.3. VOLUME 3 – PRICE AND PRO FORMA INFORMATION

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<tbody>
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<td>Vol. 3 TAB A</td>
<td>Price (Standard Form 1442, Proposal Data Sheet And Contract Line Item Schedule)</td>
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<td>Vol. 3 TAB B</td>
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<td>N/A</td>
<td>Vol. 3 TAB C</td>
<td>Required Pre-Award Information</td>
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<td>Vol. 3 TAB D</td>
<td>Sub-Contracting Plan</td>
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</table>

NOTE: 8(a) Joint Venture Offeror or Offeror submitting Proposal as HubZone Joint Venture shall submit evidence from Offerors SBA Servicing Agency that the Offeror has notified and discussed the proposed joint venture for this specific project with the appropriate SBA Representative or business Opportunity Specialist.

5.0 VOLUME 1 – FACTOR 1 – TECHNICAL

5.1. VOLUME 1 - TAB A – SUBFACTOR 1 - SPECIALIZED EXPERIENCE

5.1.1. Submission Requirements:

5.1.1.1. Design and Construction Projects. The Offeror shall submit between three (3) and five (5) projects performed by the Prime Construction Entity. Additionally, the Offeror shall submit between three (3) and five (5) projects performed by the Lead Design Entity. Limit one (1) page per project submitted, with one additional page allowed for describing past teaming experience between current team members (see below). Any information presented beyond the page limit will not be evaluated.

5.1.1.2. Teaming Experience. In one page, the Offeror shall demonstrate any previous teaming experience between current team members. Teaming experience information is limited to projects that are well underway or that have been completed and turned over no longer than the past five years preceding the issue date of this solicitation.

5.1.1.3. Special Requirements. Two (2) or more of the construction projects submitted and two (2) or more of the design projects shall clearly demonstrate experience with CONUS Small Arms Indoor Firing Ranges no smaller than 5,000 square feet in size. The government intends to hire experts in Small Arms Indoor Firing Range design and construction.

5.1.1.4. Project Information. All projects submitted should demonstrate experience on similar projects of similar or greater value. Submit projects that are currently well underway (designed and at least 50% construction progress completed) or completed and turned over no longer than five (5) years preceding the issue date of this solicitation. The proposed prime construction and lead design entities shall have performed in the same role as the prime or lead entities on the projects submitted. Offerors may identify state and local government and private contracts that are similar to the Government’s requirements set forth in the RFP. If the Offeror is a joint venture, each firm shall provide information, demonstrating experience relevant to their role on this project. If the Offeror has multiple functions or divisions, limit the project examples to those performed by the division or unit submitting the offer or by the team member. If projects were design-build, so identify them.
Project information shall CLEARLY include:

(a) Type of Facility Represented
(b) Name of Firm
(c) Name of Project
(d) Location of Project
(e) Owner, including reference POC with confirmed contact information
(f) General Scope of Construction Project
(g) Summary of Your Role in the Project
(h) Construction Cost at completion
(i) Extent and Type of Work Subcontracted Out
(j) Dates Construction Began and Completed

5.1.2. **Evaluation Criteria:** The following criteria are not listed in any particular order of importance.

5.1.2.1. Experience on similar projects that exceed the scope and value may be rated more favorably.

5.1.2.2. Federal Government project experience may be rated more favorably than non-Federal Government project experience.

5.1.2.3. Projects that included a Small Arms Indoor Firing Range as described above may be rated more favorably.

5.1.2.4. Projects that are not “well underway” or completed as defined above may be rated less favorably.

5.1.2.5. The Government will consider extent of demonstrated familiarity with applicable codes and local conditions. Previous experience in the Colorado “Front Range” region may be rated more favorably.

5.1.2.6. Previous design-build experience is not necessary for an acceptable rating. The Government may consider previous D-B experience a strength.

5.1.2.7. The Government may consider previous recent teaming experience among the team members as a strength. The more relevant the experience, the more favorably it may be rated.

5.1.2.8. Note: The Government reserves the right to verify the experience record of cited projects or other recent projects by reviewing DoD or Government appraisal systems, or through interviewing owners or references. The Government may check any or all cited references to verify supplied information.

5.1.2.9. Note: A firm will not receive credit under this subfactor for the relevant experience of key personnel proposed for this project while employed at a different firm.

5.2. **VOLUME 1 - TAB B – SUBFACTOR 2 – PROJECT MANAGEMENT PLAN**

5.2.1. **Submission Requirements:**

5.2.1.1. Provide information that describes the offeror’s Project Management approach to executing the design-build contract per the detailed requirements herein. Clearly and concisely describe the organizational and technical approaches to project management and execution, and proposed contract duration. Limit the information to fifteen (15) pages or less.
5.2.1.2. **Organization.** List the design and construction entities and describe their resources and how their resources will be utilized, their roles and responsibilities and any contractual arrangements that have been established. Clearly describe any teaming or joint venture arrangements, including a clear description of each entity’s roles and responsibilities on the project. A copy of the teaming or joint venture agreement(s) shall be appended to the plan (not included in the page limitation). Include a simple organizational chart, illustrating the organization, including the proposed quality control group(s). Identify the design firm(s) chosen for the project, if not to be self-performed. The Offeror shall document unequivocal teaming arrangements with its lead design entity (ies) and key subcontractors. Describe the proposed management structure for the team, describing the how the design and construction process will be managed and the authorities and the delegations of authority within the team. Include a key personnel organization chart that clearly depicts the key positions and the names of the personnel, their firm affiliations and their job locations and their job/position title within the organization. The key personnel organization chart shall be consistent with the corporate organization chart, with the matrix of responsibilities assigned to the D-B team entities, and with the list of key personnel to be provided under the Tab, "KEY PERSONNEL CAPABILITIES AND EXPERIENCE".

5.2.1.3. **Technical Approach for Design and Construction.** Describe the technical approach to design and construction of the facility. Include considerations for management of Small Arms Indoor Firing Range construction. Include any considerations of fast-tracking design and construction, panelized construction, pre-engineered components, etc. The Government is looking for ways to streamline construction and manage labor and other resource constraints in an effort to reduce costs and achieve an aggressive schedule while minimizing impact to the base. The Government is looking for ways to minimize impacts of the construction.

5.2.1.4. **Proposed Contract Duration:** The offeror shall propose the contract duration in the appropriate Contract Line Item Number in the CLIN Schedule and should not exceed the benchmark performance duration specified in the CLIN. The offeror shall also list this duration in this tab of the proposal.

5.2.2. **Evaluation Criteria:** The following criteria are not listed in any particular order of importance.

5.2.2.1. **Organization.** The Government will evaluate the clarity and strength of the overall organization and how well it is organized, structured and staffed to execute the entire scope of work. This subfactor will be rated as unacceptable if the Offeror has not selected and committed to use its lead design entity (ies). Joint venture participants’ contribution to the organization should be commensurate with their skills and background.

5.2.2.2. **Technical Approach for Design and Construction.** Proposals that clearly and concisely demonstrate a thorough understanding of the constraints and impacts of the Small Arms Indoor Firing Range construction may be rated more favorably. The Government places a higher value on an offer that provides proposed methods to streamline construction and manage labor and other resource constraints, in an effort to reduce costs and support an aggressive schedule including such things as fast-tracking, etc. The Government will also consider whether the approach reduces on-site craft labor and susceptibility to inclement weather delays.

5.2.2.3. **Proposed Contract Duration:** Unless changed during negotiations, this duration will become the contractually binding performance period. The Government will rate the proposed duration matching or shorter than the benchmark duration as “acceptable”. No advantage will be considered for proposals that provide a duration shorter than the proposed benchmark. A proposed duration that is longer than the proposed benchmark duration will be viewed as a deficiency. The Government will consider an unreasonably condensed contract duration, which places undue risk on the Government or which may create a risk of contract or performance failure, as a significant weakness or a deficiency, depending upon the evaluators’ judgment.

5.3. **VOLUME 1 - TAB C – SUBFACTOR 3 - KEY PERSONNEL CAPABILITIES AND EXPERIENCE**

5.3.1. **Submission Requirements:**

5.3.1.1. For key personnel provide a brief resume using the Key Personnel Resume form at the end of this Section. Indicate the position title on each project listed in resumes. Provide the name, owner, dollar amount, date of completion, and brief scope of each resume project.
Include resumes for the following key personnel:

- **Project Manager** responsible for the overall project (Prime Construction Contractor Employee)
- **Construction Quality Control System Manager** (Prime Construction Contractor Employee)
- **General Superintendent** (Prime Construction Contractor Employee)
- **Design Manager**

5.3.1.2. The minimum experience requirement for the Project Manager is 5 years of experience as a Project Manager, managing similar projects to this solicitation and a Bachelor’s degree, according to section 01 33 00.32.

5.3.1.3. The minimum experience requirement for the Contractor Quality Control (CQC) System Manager is 5 years of experience as a Quality Control Manager on similar projects to this solicitation. CQC System Manager shall comply with personnel requirements listed in Section 01 45 00.

5.3.1.4. The minimum experience requirement for the Superintendent is 5 years’ experience as superintendent, managing multiple trades and subcontractors.

5.3.1.5. The minimum experience requirements for the Design manager and designers of record are at least 5 years of design experience. The Design Manager and designers of record should be a registered in accordance with FAR 52.236-25.

5.3.1.6. Offeror shall provide unequivocal letters of commitment from all proposed key personnel NOT currently employed by the Offeror. Use the form letter at the end of this section.

5.3.1.7. Each of the key personnel shall demonstrate experience on at least one project that included a minimum 5,000 square foot Small Arms Indoor Firing Range completed or well underway in the past 5 years (as required for projects in Tab A).

5.3.2. **Evaluation Criteria:** The following criteria are not listed in any particular order of importance.

5.3.2.1. The Government will evaluate the required information to determine how well the offeror identifies and demonstrates that its key personnel meet or exceed minimum qualifications necessary, which includes previous satisfactory experience in similar type work, to manage, control and perform the design, and to perform construction.

5.3.2.2. Resumes that do not clearly state the personnel’s specific duties and job title on previous projects may be rated less favorably.

5.3.2.3. Project Managers that hold active architect or engineer professional registration will be rated more favorably.

5.3.2.4. Offerors that propose key personnel who worked on the projects in Tab A may be rated more favorably.

5.3.2.5. Key personnel that exceed the required minimum experience with Small Arms Indoor Firing Range may be rated more favorably.

5.3.2.6. Key personnel that exceed the required minimum years of experience in their position may be rated more favorably.

5.3.2.7. Previous design-build experience may be rated more favorably.

5.3.2.8. Previous Federal government project experience may be rated more favorably.

5.3.2.9. Performance of key personnel proposed for this project may be taken into account when it comes to the attention of the Government. This shall be achievable with other projected on-going work.
5.4. **VOLUME 1 - TAB D –SUBFACTOR 4 – SMALL BUSINESS PARTICIPATION PLAN (REQUIRED FOR ALL OFFERORS)**

5.4.1. **Submission Requirements:**

5.4.1.1. This sub-factor requires all offerors, regardless of size status to address their planned small business usage for this project. All offerors are required to provide a Small Business Participation Plan. It should address their corporate approach and methodology for acquiring, soliciting and using small businesses in the performance of this contract. All plans should address the Offeror's commitments to providing subcontracting opportunities, as well as evidence of planned and/or continued outreach efforts to encourage and use small businesses. This Participation Plan should include a breakdown of small business subcategories to be used as shown on the chart in (d) below.

5.4.1.2. The Participation Plan should demonstrate commitment to all federally designated categories of small business: Small Businesses (SBs), Veteran-Owned Small Businesses (VOSBs), Service-Disabled Veteran-Owned Small Businesses (SDVOSBs) HUBZone Small Businesses (HUB), Small Disadvantaged Businesses (SDBs), Woman-Owned Small Business (WOSBs), and when applicable, Historically Black Colleges/Universities/Minority Institutions (HBCU/MIs).

5.4.1.3. The plan should identify all categories for participation as part of the Offeror's team. This should include a general description of the type of work, product or service anticipated to be supplied via a small business concern. The Offeror shall not exceed more than 10 pages for the submitted Small Business Participation Plan. A specific format is not required, however, items stated below (a) through (e) shall be provided as a minimum.

**Small Business Participation Plan requirements:**

(a) Provide a Narrative addressing the corporate approach and methodology for acquiring, soliciting and using small businesses in the performance of this contract. The Narrative should address the Offeror's commitment to providing subcontracting opportunities, as well as evidence of planned and/or continued outreach efforts to encourage and use small businesses. The Narrative should provide detailed supporting documentation regarding the individual commitments expressed in percentages for evaluators to determine that the goals stated are realistic.

(b) Provide the applicable size and categories for the PRIME Offeror for this procurement.

- Large Business Prime Offeror
- Small Business Prime Offeror (also check type of SB below)
- Small Disadvantaged Business
- Woman-Owned Small Business
- HUB Zone Small Business
- Veteran Owned Small Business
- Service Disabled Veteran Owned Small Business
- Historically Black College/University or Minority Institution

(c) Submit the Total Percentages planned for Small Business. Percentages are based on Total Contract Value of the Offeror. **For this project, the awardee is targeted to subcontract 15% of the Total Contract Value to the Small Business Community.**

Total Percentage planned for Small Business: = __________%

*(Small Business Prime Contractors – Include yourselves in the above percentage.)*

*For example: If you are a Small Business Prime Contractor and will be doing 40% of the work and you will be subcontracting another 20% to other small business firms, then your Total Percentage planned for Small Business will = 60%*

(d) Indicate the total percentage of participation, Supplies/Services to be provided and the name of the small business firms intended to be used by each type of subcategory small business.
Type of Small Business | % | Supplies/Services | Name of Small Business Firms
---|---|---|---
Small Business | | | |
Small Disadvantaged Business (SDB) | | | |
Woman Owned Small Business (WOSB) | | | |
Historically Underutilized Business Zone Small Business (HUBZone) | | | |
Service Disabled Veteran-Owned (SDVOSB) | | | |
Veteran Owned (VOSB) | | | |
Historical Black Colleges/Minority Institutions (HBCU/MI) | | | |

(e) Provide types of commitments, if any are in place, for this specific acquisition either written, verbal, enforceable, non-enforceable, joint venturing, mentor-protégé, etc.

5.4.2 Evaluation Criteria:

Small Business Participation Plans will be evaluated on the basis of:

- Percentage of performance of small businesses.
  - All offeror’s proposals must meet the minimum mandatory Small Business Participation of 15% of the proposed Total Contract Value (through collective small business participation from any type of small business or sub-category small business). Offerors that exceed the targeted 15% will be rated more favorably than Offerors that meet it. Offerors that do not meet the targeted 15% will be rated lower.
  - The subcategory small business goals provided will be reviewed to ensure they are realistic in respect to this project.

- The extents of identification of the work (Supplies/Services) small firms are to perform.
- The extent to which SB firms are specifically identified in proposals.
- The extent of commitment to SB firms.

All offerors will be evaluated on the level of Small Business commitment that they demonstrate for the proposed acquisition. Plans that contain greater detail and specificity will be evaluated more favorably than general statements and commitments.

6.0 VOLUME 2 – FACTOR 2 - PAST PERFORMANCE

6.1. VOLUME 2 – TAB A – PAST PERFORMANCE

6.1.1. Submission Requirements:

Submit past performance evaluations and ratings for each project the Offeror includes in its proposal for Factor 1 - Volume 1 - Tab A Specialized Experience.
If available, submit Construction Contract Administration Support System (CCASS) or Architect-Engineer Contract Administration Support System (ACASS) Performance Evaluations ratings. For projects which were designed and/or constructed for other government entities, submit the performance appraisal sheets used by that government entity if available. For projects cited in Volume 1 - Tab A Specialized Experience not covered in the CCASS / ACASS database or other Government Design Performance Rating System, submit a Past Performance Questionnaire.

6.1.1.1. CPARS/CCASS/ACASS Evaluations

Firms are requested to retrieve their CPARS/CCASS/ACASS past performance information directly from the Past Performance Information Retrieval System (PPIRS) at http://www.ppirs.gov. PPIRS is an electronic repository of performance information collected by all the major federal performance reporting systems. Logging onto PPIRS will require the following: All firms must have purchased and installed a Public Key Infrastructure (PKI) certificate. If you do not have this certificate, you cannot access your information. Additional information about the PKI certificate is posted in red at the top, center portion, of the http://www.ppirs.gov web page. You will also need your DUNS number and Marketing Partner Identification Number (MPIN) to log onto PPIRS. The MPIN number was selected by whoever registered your firm in the Central Contractor Registry at http://www.ccr.gov. If you do not know your MPIN number, you will need to contact the CCR help desk by emailing them from the email link on the http://www.ccr.gov/help.asp web page. Please be aware that they will only release the MPIN number to the person who originally registered your firm.

There are two other ways to obtain a copy of CCASS / ACASS evaluations as follows: (1) Contact your government point of contact for the project you mentioned, and ask them if they can send you a copy, or (2) Apply for “Contractor Corporate Senior Management Representative” access on the following CCASS / ACASS web page: http://www.cpars.csd.disa.mil/. This type of access is issued to only one person within the firm, typically a member of senior management. In addition to access to your completed CCASS / ACASS performance evaluations, you will also be able to view status of evaluations which have not yet been completed. Following receipt of your faxed application request, you will be emailed a login and access instructions. This type of access will only let you see CCASS / ACASS information, so it is not as complete as PPIRS access which allows access to evaluations prepared by non-DOD federal agencies, as well as the DOD agencies which use CCASS / ACASS. Be aware that you will also need to have a PKI certificate to access the CCASS / ACASS system. This is a DOD requirement.

6.1.1.2. Past Performance Questionnaire (PPQ)

The Past Performance Questionnaire is provided for the offeror or its team members to submit to the client. The Past Performance Questionnaire should be completed by an owner or owner’s representative not affiliated with your firm. Ensure correct phone numbers and email addresses are provided for the client point of contact.

Completed Past Performance Questionnaires should be submitted with your proposal. If the offeror is unable to obtain a completed PPQ from a client for a project(s) before proposal closing date, the offeror should complete and submit with the proposal the first page of the PPQ, which will provide contract and client Information for the respective project(s). Offerors should follow-up with clients/references to ensure timely submittal of questionnaires. If the client requests, questionnaires may be submitted directly to the Government's point of contact to proposal closing date. Offerors shall not incorporate by reference into their proposal PPQs previously submitted for other RFPs. However, this does not preclude the Government from utilizing previously submitted PPQ information in the past performance evaluation.

6.1.1.3. Government Utilization of Alternate Information Sources for Past Performance

The Government will assess the past performance on projects submitted under the Specialized Experience Subfactor and reserves the right to conduct telephone interviews with points of contact identified in the proposal or to review personal knowledge. In addition, the Government may review any other sources of information for evaluating past performance of the Offeror on the submitted projects and any other previous work. Other sources may include, but are not limited to, past performance information retrieved through the Past Performance Information Retrieval System (PPIRS), including Contractor Performance Assessment Reporting System (CPARS), using all CAGE/DUNS numbers of
team members (partnership, joint venture, teaming arrangement, or parent company/subsidiary/affiliate) identified in the offeror’s proposal, inquiries of owner representative(s), Federal Awardee Performance and Integrity Information System (FAPIIS), Electronic Subcontract Reporting System (eSRS), and any other known sources not provided by the offeror.

While the Government may elect to consider data from other sources, the burden of providing detailed, current, accurate and complete past performance information rests with the Offeror.

6.1.2. Evaluation Criteria:

6.1.2.1. The Government will perform a performance confidence assessment of the offeror’s probability of successfully meeting the contract requirements, considering the degree of success of the D-B team’s recent (well under way or turned over no longer than 5 years preceding the date of this solicitation), relevant experience. See explanation of “well underway” and relevancy under the Subfactor “Specialized Experience”. The rating system used for the performance confidence assessment is described in paragraph 8.5.

6.1.2.1. Relevancy: The Government will first assess and rate the relevancy of recent projects accomplished by the offeror to the scope of this contract for overall application to the performance confidence assessment ratings described hereinafter. The projects will include those submitted under the Specialized Experience SubFactor as well as from other sources described above. This rating is not a separate proposal rating but is only used in developing an overall past performance confidence assessment rating assigned to the Past Performance Factor. The past performance relevancy ratings are described below:

(a) Very Relevant: Present/past performance effort involved essentially the same scope and magnitude of effort and complexities this solicitation requires.

(b) Relevant: Present/past performance effort involved similar scope and magnitude of effort and complexities this solicitation requires.

(c) Somewhat Relevant: Present/past performance effort involved some of the scope and magnitude of effort and complexities this solicitation requires.

(d) Not Relevant: Present/past performance effort involved little or none of the scope and magnitude of effort and complexities this solicitation requires.

6.1.2.3. Performance: The Government will next consider how well the offeror performed on the contracts. The Government will consider the currency and relevance of the information, source of the information, context of the data, and general trends in contractor performance. Past performance on projects with more relevance will typically be a stronger predictor of future success and have more influence on the past performance confidence assessment rating than past performance on projects of lesser relevance. Owners/references may be asked to comment on items such as quality of design or construction, timeliness, management of the work, subcontractor management, including timely payment to subs or suppliers, safety, relations between owner and designer or contractor, level of support for such things as as-built documentation, O&M manuals, training, correcting design or construction errors, warranty work, etc. (see the interview form). The Government will target areas covered in the requirements of this proposal including records of conforming to quality, schedule, cost control, customer satisfaction, level of support for such things as as-built documentation, O&M manuals, training, problem resolution for design or construction errors, warranty work, and safety. The Government will not release the Interview Forms to the Offeror at any time, in order for the Government to solicit candid, unbiased interview comments. The Government also places a higher value on projects, which document successful outcomes and are supported by outside source confirmation, for example, but not limited to telephone interviews with points of contact identified in the proposal, CCASS/ACASS or other agency performance databases, offeror furnished references, or personal knowledge. The Government also places a higher value on projects, which provided particularly difficult or unique challenges and the innovative methods the contractor used to resolve problems successfully. This rating is not a separate proposal rating but is only used in developing an overall past performance confidence assessment rating assigned to the Past Performance Factor. The past performance confidence ratings are described below:
(a) Substantial Confidence: Based on the offeror’s recent/relevant performance record, the Government has a high expectation that the offeror will successfully perform the required effort.

(b) Satisfactory Confidence: Based on the offeror’s recent/relevant performance record, the Government has a reasonable expectation that the offeror will successfully perform the required effort.

(c) Limited Confidence: Based on the offeror’s recent/relevant performance record, the Government has a low expectation that the offeror will successfully perform the required effort.

(d) No Confidence: Based on the offeror’s recent/relevant performance record, the Government has no expectation that the offeror will be able to successfully perform the required effort.

(e) Neutral Confidence: No recent/relevant performance record is available or the offeror’s performance record is so sparse that no meaningful confidence assessment rating can be reasonably assigned. The offeror may not be evaluated favorably or unfavorably on the factor of past performance.

6.1.2.4. Each entity (firm) will be rated on its own performance or that of its predecessor, if relevant. An entity may not establish past performance based on the past performance of its proposed key personnel, apart from that of the entity. If any firm has multiple functions or divisions, The Government will only evaluate past performance of the division or unit submitting the offer or by the team member. If the Government does not obtain past performance information for the projects identified by the offeror and cannot establish a past performance record for the offeror through other sources, past performance will be rated neither favorably nor unfavorably. The performance confidence assessment rating will be considered “Unknown Confidence”.

7.0 VOLUME 3 – PRICE AND PRO FORMA INFORMATION

7.1 GENERAL
Submit the Pro Forma information in a separate sealed envelope labeled: “Volume 2 – Price and Pro Forma Information.” Submit the original and one copy.

7.2 VOLUME 3 - TAB A – PRICE (STANDARD FORM 1442, PROPOSAL DATA SHEET AND CONTRACT LINE ITEM SCHEDULE)

7.2.1 Submission Requirements:

7.2.1.1. Submit the properly filled out and executed SF 1442, along with the CLIN Schedule, containing proposed line item and total pricing, as well as the proposed performance duration. See instructions in Section 00 21 00, “Instructions to Offerors”; Submit the Proposal Data Sheet.

7.2.1.2. Supplemental Price Breakdown. If deemed necessary to evaluate the price proposals, the Government will request a price breakdown of the Contract Line Items in a sealed envelope marked “Price Breakdown Information”, in Excel format. The Government will provide details on where and how to send the breakdown. This information will not be needed sooner than three working days after the proposal submission due date. This information may be required for the initial proposal and, if requested, for any revised proposals. This information is not an opportunity for an offeror to revise its non-price or price proposal.

7.2.2 Evaluation Criteria:

Price will not be rated or scored, but will be evaluated for fairness and reasonableness through the use of a price analysis. The price evaluators will also check for appearance of unbalanced line item prices. The Government is likely to not make award if the construction cost limitation set for this project is exceeded. Offerors are cautioned to distribute direct costs, such as material, labor, equipment, subcontracts, etc. and to evenly distribute indirect costs, such as job overhead, home office overhead,
bond, etc., to the appropriate contract line items. If deemed necessary, the supplemental price breakdown information will be used to assist the Government in performing the price evaluations described above. **All evaluation factors, other than price, when combined, are considered significantly more important than price.**

7.3. VOLUME 3 - TAB B – EVIDENCE OF BONDABILITY

7.3.1. Submission Requirements:
Submit information showing Offeror's bondability in the amount of the proposal. Include the name, address and telephone number of the prime contractor's bonding agent.

7.3.2. Evaluation Requirements:
This item is not rated. Bonding information will be reviewed to determine the Offeror's ability to obtain the required Performance and Payment Bonds. The prime contractor is required to be able to obtain the level of bonding required by the solicitation from an acceptable surety.

7.4. VOLUME 3 - TAB C – REQUIRED PRE-AWARD INFORMATION

7.4.1. Submission Requirements:

7.4.1.1. Submit this information for the Contracting Officer’s determination of offeror responsibility, which includes, but is not limited to, the following:

1. A list of present commitments, including the dollar value thereof, and name of the organization under which the work is being performed. Include names and telephone numbers of personnel within each organization who are familiar with the prospective contractor’s performance.

2. A certified statement listing; (1) each contract awarded within the preceding three month period exceeding $1,000,000.00 in value with a brief description of the contract; and (2) each contract awarded within the preceding three year period not already physically completed and exceeding $5,000,000.00 in value with a brief description of the contract.

3. If the prospective contractor is a joint venture, each joint venture member will be required to submit the above defined certification.

7.4.1.2. One copy of the following information shall be provided:

1. Proof of Financial Ability (Most recent financial statement covering assets and liabilities)

2. Number of years the firm has been in business

3. Name, address and telephone number of firm’s bonding company

4. Information showing offeror’s bondability for this project. Include the bond rate.

5. Name, address and telephone numbers of two credit/trade references.

7.4.2. Evaluation Criteria:
In addition to the other proposal information, the Contracting Officer shall use this information in making an affirmative responsibility determination for award to the Successful Offeror, in accordance with FAR Part 9.

7.5. VOLUME 3 - TAB D – SUBCONTRACTING PLAN

7.5.1. A Subcontracting Plan is not required to be submitted with the offeror’s proposal. It shall only be required from the otherwise successful offeror and only applies if that offeror is an “Other Than Small” (Large) Business. Do not submit a Subcontracting Plan unless requested to do so by the Contracting Officer.

7.5.1.1. If the Offeror proposing on this solicitation is a large business concern, in accordance with the definition as identified in FAR Clause 52.219-1, “SMALL BUSINESS PROGRAM REPRESENTATION”, (upon notification that it is the apparent successful Offeror,) the firm must submit a small business
subcontracting plan in accordance with FAR Clause 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN. The goals established for small business, small disadvantaged business, woman-owned business, HUBZone business, Service disabled veteran-owned small business participation are described in Section 00 21 01, Instructions, Conditions and Notices to Offerors.

7.5.1.2. The Offeror should provide as much specific information on proposed subcontracted effort for the contract as possible. The Small Business Subcontracting Plan shall be thorough, complete, and in accordance with AFARS Appendix DD and FAR Clause 52.219-9, as it will be incorporated into the contract upon award of the contract to the Offeror, if acceptable and upon final approval of the Contracting Officer.

7.5.1.3. The Plan shall include a description of the types of services the firm proposes to subcontract with small business (SB), small disadvantaged business (SDB), woman-owned small business (WOSB), HUBZone business, and service-disabled veteran-owned small business (SDVOSB), along with the proposed percentages of their participation, to demonstrate a plan to meet the subcontracting goals that will apply to these contracts. If practical, the Offeror shall provide specific information on proposed subcontracted effort for this project.

7.5.1.4. Large Business concerns shall also submit their subcontracting compliance on previous projects completed or underway within the past three years of the date of this solicitation. This requirement may be supported by using copies of the U.S. Government Standard Form 295.

7.5.2. Evaluation Criteria:

7.5.2.1. The Government will evaluate the Plan in accordance with the rating scheme in Army FAR Supplement Appendix DD and with the requirements of FAR Clause 52.219-9. This factor is rated as GO/NO-GO. To be acceptable ("GO" rating), subcontracting plans submitted by Large Business Offerors must adequately address their required statutory elements:

(1) Provide sufficient information to enable the Contracting Officer to answer affirmatively questions A through H of Appendix DD, Part 2, number 8, (Army FAR Supplement 19.705).

(2) A subcontracting plan that is rated 70 percent or less under the AFARS evaluation system will not be considered acceptable. The Government will review those areas where the plan is deficient with the Offeror with the goal of correcting deficiencies.

(3) As part of the evaluation, the Government will compare the small business subcontracting opportunities in the plan with the goals established in the solicitation with additional consideration given for a proposed subcontracting plan that exceeds the goals established in Section 00 21 00 of this solicitation. The Government will give additional credit for a plan which is more specific in nature as to the proposed subcontracting opportunities for Small Business Community (small business (SB), small disadvantaged business (SDB), woman-owned small business (WOSB), HUBZone small business (HUBZone), and service-disabled veteran-owned small business (SDVOSB).

(4) As part of the subcontracting plan evaluation, the Government will also evaluate the Offeror's past performance in establishing realistic, yet challenging, goals and achieving them.

(5) Total dollars subcontracted to small business concerns is a minimum of 15 percent of the contract award amount.

7.5.2.2. Due to requirements for review of the successful Offeror's subcontracting plan by other agencies, the Government reserves the right to negotiate the details of the final plan with the successful Offeror before award can be made. Minor weaknesses or minor deficiencies will not make the otherwise successful offeror ineligible, however award cannot occur until the Plan is deemed at least acceptable. This process is not considered to be discussions per FAR 15.306.

8.0 EVALUATION PROCEDURES

8.1. SOURCE SELECTION EVALUATION BOARD (SSEB)

8.1.1. The SSEB will be established to conduct the evaluation of proposals received in response to this solicitation. The evaluation will be based on the content of the proposal and any subsequent
discussions required, as well as information obtained from other sources, e.g. past performance information. The SSEB will not consider any information incorporated by reference, except as expressly allowed by this solicitation.

8.2. EVALUATION

8.2.1. The SSEB will evaluate the proposals and assign a consensus rating for each evaluation factor and subfactor, except that performance risk ratings are assigned to past performance (see below).

8.2.2. The Government may award without discussions. Offerors are cautioned to put forth their best efforts and to furnish all information clearly to allow the Government to evaluate proposals. Offerors should not assume that they will have an opportunity to clarify or correct anything in their proposal after submitting it.

8.2.3. A “Competitive Range” is a subjective determination of the most highly rated proposals in the event that the Government decides that discussions with offerors are required or are considered to be in the Government’s best interests. In such an event, the Contracting Officer will establish a competitive range of all the most highly rated proposals.

8.2.4. If discussions are held, the Government may engage in a broad give-and-take with those offerors in the competitive range, in accordance with FAR 15.306 (d). The Government will provide the Offeror an advance agenda for the discussions. During discussions, the Government may ask the Offeror to further explain its proposal and to answer questions about it.

8.2.5. Upon conclusion of discussions, those offerors still considered the most highly rated will be afforded an opportunity to submit their proposal revisions for final evaluation and selection.

8.3. DEFINITIONS

8.3.1. **Best Value**

The expected outcome of an acquisition that, in the Government’s estimation, provides the greatest overall benefit in response to the requirement. See FAR 2.101.

8.3.2. **Deficiency**

A material failure of a proposal to meet a Government requirement or a combination of significant weaknesses in a proposal that increases the risk of unsuccessful contract performance to an unacceptable level. See FAR 15.001.

8.3.3. **Weakness**

A flaw in the proposal that increases the risk of unsuccessful contract performance. See FAR 15.001.

8.3.4. **Strength**

An aspect of an offeror’s proposal that has merit or exceeds specified performance or capability requirements in a way that will be advantageous to the Government during contract performance.

8.3.5. **Deviation**

Proposal implies or specifically offers a deviation below the specified criteria. The offeror may or may not have called the deviation to the Government’s attention. A deviation is a deficiency. The proposal must conform to the solicitation requirements for award.

8.3.6. **Competitive Range**

See FAR 15.306(c).

8.3.7. **Clarifications**
Clarifications are limited exchanges between the Government and offerors that may occur when award without discussions is contemplated. See FAR 15.306(a)(1).

8.3.8. **Communications**

Communications are exchanges between the Government and offerors after receipt of proposals, leading to establishment of the competitive range. See FAR 15.306(b).

8.3.9. **Discussions**

Discussions are exchanges (i.e., negotiations) in a competitive environment and are undertaken with the intent of allowing the offeror to revise its proposal. Discussions take place after establishment of the competitive range. See FAR 15.306(d).

8.3.10. **Neutral/Unknown Risk**

No relevant performance record is identifiable upon which to base a meaningful performance risk prediction. A search was unable to identify any relevant past performance information for the entity being rated. This is neither a negative or positive assessment.

8.3.11. **Evaluation Notice (EN)**

Evaluation Notice (EN) is the PCO's written notification to the offeror for purposes of clarifications, communications, or in support of discussions.

8.3.12. **Performance Confidence Assessment**

An evaluation of the likelihood (or Government's confidence) that the offeror will successfully perform the solicitation's requirements; the evaluation is based upon past performance information.

8.3.13. **Recency**

As it pertains to past performance information, is a measure of the time that has elapsed since the past performance reference occurred. Recency is generally expressed as a time period during which past performance references are considered relevant.

8.3.14. **Relevancy**

As it pertains to past performance information, is a measure of the extent of similarity between the service/support effort, complexity, dollar value, contract type, and subcontract/teaming or other comparable attributes of past performance examples and the solicitation requirements; and a measure of the likelihood that the past performance is an indicator of future performance.

8.3.15. **Risk**

As it pertains to source selection, is the potential for unsuccessful contract performance. The consideration of risk assesses the degree to which an offeror’s proposed approach to achieving the technical factor or subfactor may involve risk of disruption of schedule, increased cost or degradation of performance, the need for increased Government oversight, and the likelihood of unsuccessful contract performance. (for firm-fixed-price contracts, the reference to increased cost may be removed from the risk definition.)

8.3.16. **Significant Weakness**

A significant weakness in the proposal is a flaw that appreciably increases the risk of unsuccessful contract performance. See FAR 15.001.

8.3.17. **Source Selection Authority (SSA)**
The official designated to make the source selection decision.

8.3.18. **Source Selection Decision Document (SSDD)**

The document that reflects the SSA’s independent, integrated, comparative assessment and decision.

8.3.19. **Source Selection Evaluation Board (SSEB)**

A group of individuals representing the various functional disciplines relevant to the acquisition that is responsible for evaluating proposals against the solicitation criteria.

8.3.20. **Source Selection Information**

Information prepared for use by an agency for the purpose of evaluating a bid or proposal to enter into an agency procurement contract, if that information has not been previously made available to the public or disclosed publicly. See FAR 2.101 for a listing of source selection information.

8.3.21. **Subjective Tradeoff**

A source selection process that is used when it may be in the best interest of the Government to consider award to other than the lowest priced offeror or other than the highest technically rated offeror but it is not possible to place a quantifiable value on proposed performance or capabilities above the threshold (minimum) requirements.

8.3.22. **Threshold (or Threshold (minimum))**

The minimum acceptable value of an attribute that is considered achievable within the available cost, schedule, and technology at low-to-moderate risk. Performance below the threshold value is not operationally effective or suitable or may not provide an improvement over current capabilities. (See also “mandatory minimums” in FAR 15.306(d)(4).)

8.4. **EVALUATION RATING SYSTEM**

8.4.1. **General:** The Government will review the proposals and rate the quality of each technical evaluation factor and subfactor (if any). The SSEB will rate each proposal against the specified evaluation criteria in the Solicitation requirements.

8.4.2. **Review Write-up:** The Government will support each rating with a narrative, separately listing all strengths, weaknesses, deficiencies, and required clarifications.

8.4.3. **Rating System:** The application of a scale of colors or words used in conjunction with the narrative to denote the degree to which the proposal has met the standard for a non-cost factor. After listing proposal strengths, weaknesses and deficiencies, the SSEB will assign an adjective rating of “Blue - Outstanding”, “Purple - Good”, “Green - Acceptable”, “Yellow - Marginal”, or “Red - Unacceptable” to each factor and subfactor (except those factors rated as GO/NO-GO and the Past Performance Subfactor), which reflect the Government’s confidence in each offeror’s ability, as demonstrated in its proposal, to perform the requirements stated in the RFP. The adjectival ratings shall be assigned, using the following criteria, which incorporate a proposal risk assessment for a combined technical/risk rating:

8.4.3.1. **Blue - Outstanding:** Proposal indicates an exceptional approach and understanding of the requirements and contains multiple strengths, and risk of unsuccessful performance is low.

8.4.3.2. **Purple - Good:** Proposal indicates a thorough approach and understanding of the requirements and contains at least one strength, and risk of unsuccessful performance is low to moderate.

8.4.3.3. **Green - Acceptable:** Proposal indicates an adequate approach and understanding of the requirements, and risk of unsuccessful performance is no worse than moderate.

8.4.3.4. **Yellow - Marginal:** Proposal has not demonstrated an adequate approach and understanding of the requirements, and/or risk of unsuccessful performance is high.
8.4.3.5. **Red - Unacceptable.** Proposal does not meet requirements of the solicitation, and thus, contains one or more deficiencies, and/or risk of unsuccessful performance is unacceptable. Proposal is unawardable.

8.5. **PAST PERFORMANCE CONFIDENCE ASSESSMENT RATING SYSTEM**

8.5.1. Past Performance Confidence Assessment Ratings assess the offeror’s likelihood of success in performing the requirements stated in the RFP based on the offeror’s demonstrated performance on recent, relevant contracts.

8.5.2. Performance Confidence Assessment (Overall) Rating System:

8.5.2.1. **Substantial Confidence:** Based on the offeror’s recent/relevant performance record, the Government has a high expectation that the offeror will successfully perform the required effort.

8.5.2.2. **Satisfactory Confidence:** Based on the offeror’s recent/relevant performance record, the Government has a reasonable expectation that the offeror will successfully perform the required effort.

8.5.2.3. **Limited Confidence:** Based on the offeror’s recent/relevant performance record, the Government has a low expectation that the offeror will successfully perform the required effort.

8.5.2.4. **No Confidence:** Based on the offeror’s recent/relevant performance record, the Government has no expectation that the offeror will be able to successfully perform the required effort.

8.5.2.5. **Unknown Confidence (Neutral):** No recent/relevant performance record is available or the offeror’s performance record is so sparse that no meaningful confidence assessment rating can be reasonably assigned. The offeror may not be evaluated favorably or unfavorably on the factor of past performance.
SECTION 00 22 00 - ATTACHMENT 1
COMPANY SPECIALIZED EXPERIENCE - CONSTRUCTION OR PRIME CONTRACTOR

Provide the following information to show examples of projects your company constructed within the last five years indicating experience with projects of similar type and scope. Use one form per project.

(a) Type of Facility Represented
(b) Your Firm's Name
(c) Name of Project
(d) Location of Project
(e) Owner
(f) General Scope of Construction Project
(g) Your Role (Prime, Joint Venture, or Subcontractor, etc.) and Work Your Company Self-Performed:
(h) At Completion Construction Cost
(i) Extent and Type of Work You Subcontracted Out
(j) Dates Construction: Began Completed
(k) Your Performance Evaluation by Owner, if known
(l) Were You Terminated or Assessed Liquidated Damages?
(m) Owner's Point of Contact for Reference (Name and Company)
(n) Current Telephone Number of Reference POC
SECTION 00 22 00 - ATTACHMENT 2
COMPANY SPECIALIZED EXPERIENCE - DESIGN FIRM OR IN-HOUSE DESIGN CAPABILITY

Provide the following information to show examples of projects your company constructed within the last five years indicating experience with projects of similar type and scope. Use one form per project.

(a) Type of Facility Represented ____________________________________________________________

(b) Your Firm’s Name ______________________________________________________________________

(c) Name of Project _______________________________________________________________________

(d) Location of Project _____________________________________________________________________

(e) Owner _________________________________________________________________________________

(f) General Scope of Construction Project ______________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

(g) Summary of Your Role in Design of this Project, including Small Arms Indoor Firing Range design

________________________________________________________________________________________

________________________________________________________________________________________

(h) Identify Estimated (“E”) or Actual (“A”) Construction Cost _______________________________________

(i) Extent and Type of Work You Subcontracted __________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

(j) Dates Design: Began___________________ Completed______________

(k) Dates Construction: Began___________________ Completed______________

(l) Your Performance Evaluation, if known __ _____________________________________________________

(m) Were You Terminated or Assessed Liquidated Damages? ______________________________________

(If either is “Yes”, attach an Explanation)

(n) Owner’s Point of Contact for Reference (Name and Company) _____________________________________

________________________________________________________________________________________

(o) Current Telephone Number of Reference POC__________________________________________________
SECTION 00 22 00 - ATTACHMENT 3
COMPANY SPECIALIZED EXPERIENCE
KEY SUBCONTRACTOR (OR PRIME IF WORK NOT TO BE SUBCONTRACTED)

Provide the following information to show examples of projects your company constructed within the last five years indicating experience with projects of similar type and scope. Use one form per project.

(a) Type of Facility Represented __________________________________________________________

(b) Your Firm’s Name ______________________________________________________________________

(c) Name of project __________________________________________________________________________

(d) Owner _________________________________________________________________________________

(e) General Scope of Construction Project ______________________________________________________

(f) Your Role (Prime, Joint Venture, or Subcontractor, etc.) and Work Your Company Self-Performed : ________

(g) Your Contract or Subcontract Amount _____________________________________________________

(h) Detailed Description of Your Self-Performed Work _______________________________________________

(i) Describe any Work You Subcontract to Others __________________________________________________

(j) Dates Your (sub) contract: Started_______________ Completed______________

(k) Your Performance Evaluation by Owner, if any _________________________________________________

By Prime: ________________________________________________________________________________

(l) Were You Terminated or Assessed Liquidated Damages? ________________________________________

(If either is “Yes”, attach an Explanation)

(m) Name and Company of Point of Contact (POC) for reference (If you were a subcontractor, also list the firm you were hired by):

___________________________________________________________________________________________

(n) Current Telephone Number of Reference POC ________________________________________________
## NAVFAC/USACE PAST PERFORMANCE QUESTIONNAIRE (Form PPQ-0)

**CONTRACT INFORMATION** (Contractor to complete Blocks 1-4)

1. **Contractor Information**
   - Firm Name:  
   - CAGE Code:  
   - Address:  
   - DUNs Number:  
   - Phone Number:  
   - Email Address:  
   - Point of Contact:  
   - Contact Phone Number:  

2. **Work Performed as:**
   - [ ] Prime Contractor
   - [ ] Sub Contractor
   - [ ] Joint Venture
   - [ ] Other (Explain)
   - Percent of project work performed:  
   - If subcontractor, who was the prime (Name/Phone #):  

3. **Contract Information**
   - Contract Number:  
   - Delivery/Task Order Number (if applicable):  
   - Contract Type:  
     - [ ] Firm Fixed Price
     - [ ] Cost Reimbursement
     - [ ] Other (Please specify):  
   - Contract Title:  
   - Contract Location:  
   - Award Date (mm/dd/yy):  
   - Contract Completion Date (mm/dd/yy):  
   - Actual Completion Date (mm/dd/yy):  
   - Explain Differences:  
   - Original Contract Price (Award Amount):  
   - Final Contract Price (to include all modifications, if applicable):  
   - Explain Differences:  

4. **Project Description:**
   - Complexity of Work  
     - [ ] High
     - [ ] Med
     - [ ] Routine
   - How is this project relevant to project of submission? (Please provide details such as similar equipment, requirements, conditions, etc.):  
   -  
   -  
   -  
   -  

**CLIENT INFORMATION** (Client to complete Blocks 5-8)

5. **Client Information**
   - Name:  
   - Title:  
   - Phone Number:  
   - Email Address:  

6. **Describe the client’s role in the project:**  

7. **Date Questionnaire was completed** (mm/dd/yy):  

8. **Client’s Signature:**  

---

**NOTE:** NAVFAC/USACE REQUESTS THAT THE CLIENT COMPLETES THIS QUESTIONNAIRE AND SUBMITS DIRECTLY BACK TO THE OFFEROR. THE OFFEROR WILL SUBMIT THE COMPLETED QUESTIONNAIRE TO USACE WITH THEIR PROPOSAL, AND MAY DUPLICATE THIS QUESTIONNAIRE FOR FUTURE SUBMISSION ON USACE SOLICITATIONS.
CLIENTS ARE HIGHLY ENCOURAGED TO SUBMIT QUESTIONNAIRES DIRECTLY TO THE OFFEROR. HOWEVER, QUESTIONNAIRES MAY BE SUBMITTED DIRECTLY TO USACE. PLEASE CONTACT THE OFFEROR FOR USACE POC INFORMATION. THE GOVERNMENT RESERVES THE RIGHT TO VERIFY ANY AND ALL INFORMATION ON THIS FORM.
**ADJECTIVE RATINGS AND DEFINITIONS TO BE USED TO BEST REFLECT YOUR EVALUATION OF THE CONTRACTOR’S PERFORMANCE**

<table>
<thead>
<tr>
<th>RATING</th>
<th>DEFINITION</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(E) Exceptional</td>
<td>Performance meets contractual requirements and exceeds many to the Government/Owner’s benefit. The contractual performance of the element or sub-element being assessed was accomplished with few minor problems for which corrective actions taken by the contractor was highly effective.</td>
<td>An Exceptional rating is appropriate when the Contractor successfully performed multiple significant events that were of benefit to the Government/Owner. A singular benefit, however, could be of such magnitude that it alone constitutes an Exceptional rating. Also, there should have been NO significant weaknesses identified.</td>
</tr>
<tr>
<td>(VG) Very Good</td>
<td>Performance meets contractual requirements and exceeds some to the Government’s/Owner’s benefit. The contractual performance of the element or sub-element being assessed was accomplished with some minor problems for which corrective actions taken by the contractor were effective.</td>
<td>A Very Good rating is appropriate when the Contractor successfully performed a significant event that was of benefit to the Government/Owner. There should have been no significant weaknesses identified.</td>
</tr>
<tr>
<td>(S) Satisfactory</td>
<td>Performance meets minimum contractual requirements. The contractual performance of the element or sub-element contains some minor problems for which corrective actions taken by the contractor appear or were satisfactory.</td>
<td>A Satisfactory rating is appropriate when there were only minor problems, or major problems that the contractor recovered from without impact to the contract. There should have been NO significant weaknesses identified. Per DOD policy, a fundamental principle of assigning ratings is that contractors will not be assessed a rating lower than Satisfactory solely for not performing beyond the requirements of the contract.</td>
</tr>
<tr>
<td>(M) Marginal</td>
<td>Performance does not meet some contractual requirements. The contractual performance of the element or sub-element being assessed reflects a serious problem for which the contractor has not yet identified corrective actions. The contractor's proposed actions appear only marginally effective or were not fully implemented.</td>
<td>A Marginal is appropriate when a significant event occurred that the contractor had trouble overcoming which impacted the Government/Owner.</td>
</tr>
<tr>
<td>(U) Unsatisfactory</td>
<td>Performance does not meet most contractual requirements and recovery is not likely in a timely manner. The contractual performance of the element or sub-element contains serious problem(s) for which the contractor's corrective actions appear or were ineffective.</td>
<td>An Unsatisfactory rating is appropriate when multiple significant events occurred that the contractor had trouble overcoming and which impacted the Government/Owner. A singular problem, however, could be of such serious magnitude that it alone constitutes an unsatisfactory rating.</td>
</tr>
<tr>
<td>(N) Not Applicable</td>
<td>No information or did not apply to your contract</td>
<td>Rating will be neither positive nor negative.</td>
</tr>
</tbody>
</table>
TO BE COMPLETED BY CLIENT

PLEASE CIRCLE THE ADJECTIVE RATING WHICH BEST REFLECTS YOUR EVALUATION OF THE CONTRACTOR’S PERFORMANCE.

<table>
<thead>
<tr>
<th>1. QUALITY:</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>a) Quality of technical data/report preparation efforts</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>b) Ability to meet quality standards specified for technical performance</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>c) Timeliness/effectiveness of contract problem resolution without extensive customer guidance</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>d) Adequacy/effectiveness of quality control program and adherence to contract quality assurance requirements (without adverse effect on performance)</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. SCHEDULE/TIMELINESS OF PERFORMANCE:</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>a) Compliance with contract delivery/completion schedules including any significant intermediate milestones. <em>(If liquidated damages were assessed or the schedule was not met, please address below)</em></td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>b) Rate the contractor’s use of available resources to accomplish tasks identified in the contract</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
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</table>

<table>
<thead>
<tr>
<th>3. CUSTOMER SATISFACTION:</th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>a) To what extent were the end users satisfied with the project?</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>b) Contractor was reasonable and cooperative in dealing with your staff (including the ability to successfully resolve disagreements/disputes; responsiveness to administrative reports, businesslike and communication)</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>c) To what extent was the contractor cooperative, businesslike, and concerned with the interests of the customer?</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>d) Overall customer satisfaction</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. MANAGEMENT/ PERSONNEL/LABOR</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>a) Effectiveness of on-site management, including management of subcontractors, suppliers, materials, and/or labor force?</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>b) Ability to hire, apply, and retain a qualified workforce to this effort</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>c) Government Property Control</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>d) Knowledge/expertise demonstrated by contractor personnel</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>e) Utilization of Small Business concerns</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>f) Ability to simultaneously manage multiple projects with multiple disciplines</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>g) Ability to assimilate and incorporate changes in requirements and/or priority, including planning, execution and response to Government changes</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
</tr>
<tr>
<td>h) Effectiveness of overall management (including ability to effectively lead, manage and control the program)</td>
<td>E</td>
<td>VG</td>
<td>S</td>
<td>M</td>
<td>U</td>
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</table>
### 5. COST/FINANCIAL MANAGEMENT

<table>
<thead>
<tr>
<th></th>
<th>E</th>
<th>VG</th>
<th>S</th>
<th>M</th>
<th>U</th>
<th>N</th>
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<tbody>
<tr>
<td>a) Ability to meet the terms and conditions within the contractually agreed price(s)?</td>
<td></td>
<td></td>
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<tr>
<td>b) Contractor proposed innovative alternative methods/processes that reduced cost, improved maintainability or other factors that benefited the client</td>
<td></td>
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<tr>
<td>c) If this is/was a Government cost type contract, please rate the Contractor’s timeliness and accuracy in submitting monthly invoices with appropriate back-up documentation, monthly status reports/budget variance reports, compliance with established budgets and avoidance of significant and/or unexplained variances (under runs or overruns)</td>
<td></td>
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<tr>
<td>d) Is the Contractor’s accounting system adequate for management and tracking of costs? <em>If no, please explain in Remarks section.</em></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>e) If this is/was a Government contract, has/was this contract been partially or completely terminated for default or convenience or are there any pending terminations? <em>Indicate if show cause or cure notices were issued, or any default action in comment section below.</em></td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>f) Have there been any indications that the contractor has had any financial problems? <em>If yes, please explain below.</em></td>
<td>Yes</td>
<td>No</td>
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### 6. SAFETY/SECURITY

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<tr>
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<th>M</th>
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<th>N</th>
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<tbody>
<tr>
<td>a) To what extent was the contractor able to maintain an environment of safety, adhere to its approved safety plan, and respond to safety issues? <em>(Includes: following the users rules, regulations, and requirements regarding housekeeping, safety, correction of noted deficiencies, etc.)</em></td>
<td></td>
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<tr>
<td>b) Contractor complied with all security requirements for the project and personnel security requirements.</td>
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### 7. GENERAL

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<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Ability to successfully respond to emergency and/or surge situations (including notifying COR, PM or Contracting Officer in a timely manner regarding urgent contractual issues).</td>
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<tr>
<td>b) Compliance with contractual terms/provisions <em>(explain if specific issues)</em></td>
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<td></td>
</tr>
<tr>
<td>c) Would you hire or work with this firm again? <em>(If no, please explain below)</em></td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) In summary, provide an overall rating for the work performed by this contractor.</td>
<td></td>
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</tbody>
</table>

Please provide responses to the questions above *(if applicable) and/or additional remarks. Furthermore, please provide a brief narrative addressing specific strengths, weaknesses, deficiencies, or other comments which may assist our office in evaluating performance risk *(please attach additional pages if necessary):*
SECTION 00 22 00 - ATTACHMENT 5
KEY PERSONNEL RESUME

Provide information, listed below, on separate sheets showing qualifications of: prime contractor’s project manager responsible for design and construction, the design manager, the designers of record for architecture, interior design, structural, civil, geotechnical, fire protection, electrical, and mechanical/plumbing. For construction, include the on-site manager and general superintendent (in charge of self-performed work). Use a continuation sheet, if needed. NOTE: Match the positions on this page to the list of key personnel in the narrative submission requirements and evaluation criteria.

(a) Your Name and Title__________________________________________________________

(a) Your Assignment on this Project______________________________________________

(b) Name of Your Firm________________________________________________________

(c) No. of Years: With this Firm________ With other Firms________

(d) Education: Degree(s)/Year/Specialization________________________________________

(e) __________________________________________________________________________

(f) Active Registration, if any: No._______, State(s) ______,

First Year/ Current Year _____/______

(g) Describe Your Specific Experience and Qualifications Relevant to this Project (List Projects):

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________
TO: Contracting Officer
SUBJECT: Letter of Commitment for Proposed Contract for ____________________

Dear Sir or Madam:

I hereby make the unequivocal commitment that, in the event of an award of a contract to (Fill in name of Proposer), that I will fulfill the duty of (Job Title).

Sincerely, (prospective employee signs)

Date: __________
TO: Contracting Officer  
SUBJECT: Letter of Commitment for Proposed Contract for ____________________  

Dear Sir or Madam:  

I hereby make the unequivocal commitment that, in the event of an award of a contract to (Fill in name of Proposer), that (insert name of design firm) will fulfill the duties of (state role on a project) 

Sincerely, (Authorized Official)  

Date: __________
SECTION 00 22 00 - ATTACHMENT 8
PROPOSAL DATA SHEET

(1) Name of Solicitation:

Name of Firm:

Address:

Phone:

Fax:

E-mail:

DUNS # (used for accessing the Construction Contractor Appraisal Support System (CCASS) or A-E Contractor Administration Support System (ACASS) Database)

Also provide any other assigned number that identifies the member firm(s) in the ACASS or CCASS databases. If a separate DUNS has been created for a joint venture (J-V) it must also be submitted. Provide a DUNS number for each company identified in any proposed Contractor-subcontractor association of firms. If the firm is a joint venture or contractor-subcontractor association of firms, list the individual firms and briefly describe the nature of the association. Provide DUNS for each.

Firm 1:

Firm 2:

Firm 3:

Nature of Association:

(2) AUTHORIZED NEGOTIATORS. FAR 52.215-11

The Offeror represents that the following persons are authorized to negotiate on its behalf with the Government in connection with this Request for Proposals (RFP).

[List names, titles, and telephone number of the authorized negotiator.]

Name of Person Authorized to Negotiate:

Negotiator's Address:

Negotiator's Telephone:

Negotiator's E-mail:

End of Section 00 22 00
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DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 00 45 00

REPRESENTATIONS AND CERTIFICATIONS

01/17

PART 1   GENERAL

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1.2   52.204-19  Incorporation By Reference Of Representations And Certifications (Dec 2014)
1.3   52.209-7  Information Regarding Responsibility Matters (Jul 2013)
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1.10   252.209-7999 Representation By Corporations Regarding An Unpaid Delinquent Tax Liability Or A Felony Conviction Under Any Federal Law (Deviation 2012-O0004) (Jan 2012)

PART 2   NOT USED

PART 3   NOT USED

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PART 1   GENERAL

IMPORTANT NOTE:
Online Representations and Certifications Application per FAR 52.204-8
ANNUAL REPRESENTATIONS AND CERTIFICATIONS is required to be completed.

Failure of completing applicable requirements contained herein and online
representations and certifications and/or provisions may result in delay of
contract award. Online Representations and Certifications are available at:
https://www.sam.gov/portal/public/SAM/

Provide the following certifications and representations as a part of the
proposal, check the appropriate boxes, fill in the appropriate information,
and submit with Standard Form 1442 (Section 00 10 00).

1.1 FAR 52.204-8 Annual Representations And Certifications (Jan 2017)

(a)(1) The North American Industry Classification System (NAICS) code for
this acquisition is [insert NAICS code].
(2) The small business size standard is a concern for which the average
annual receipts of the preceding three (3) fiscal years did not exceed
$[36.5][15.0] million.
(3) The small business size standard for a concern which submits an offer
in its own name, other than on a construction or service contract, but
which proposes to furnish a product which it did not itself manufacture, is
500 employees.
(b)(1) If the provision at 52.204-7, System for Award Management, is
included in this solicitation, paragraph (d) of this provision applies.
(2) If the provision at 52.204-7 is not included in this solicitation, and
the offeror is currently registered in System for Award Management (SAM),
and has completed the Representations and Certifications section of SAM
electronically, the offeror may choose to use paragraph (d) of this
provision instead of completing the corresponding individual
representations and certifications in the solicitation. The offeror shall
indicate which option applies by checking one of the following boxes:
[ X ] (i) Paragraph (d) applies.
[ ] (ii) Paragraph (d) does not apply and the offeror has completed the
individual representations and certifications in the solicitation.
(c)(1) The following representations or certifications in SAM are
applicable to this solicitation as indicated:
(i) 52.203-2, Certificate of Independent Price Determination. This
provision applies to solicitations when a firm-fixed-price contract or
fixed-price contract with economic price adjustment is contemplated,
unless-
(A) The acquisition is to be made under the simplified acquisition
procedures in Part 13;
(B) The solicitation is a request for technical proposals under two-step
sealed bidding procedures; or
(C) The solicitation is for utility services for which rates are set by law
or regulation.
(ii) 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions. This provision applies to solicitations expected to exceed $150,000.

(iii) 52.203-18, Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements or Statements-Representation. This provision applies to all solicitations.

(iv) 52.204-3, Taxpayer Identification. This provision applies to solicitations that do not include the provision at 52.204-7, System for Award Management.

(v) 52.204-5, Women-Owned Business (Other Than Small Business). This provision applies to solicitations that-
(A) Are not set aside for small business concerns;
(B) Exceed the simplified acquisition threshold; and
(C) Are for contracts that will be performed in the United States or its outlying areas.

(vi) 52.209-2, Prohibition on Contracting with Inverted Domestic Corporations-Representation.

(vii) 52.209-5, Certification Regarding Responsibility Matters. This provision applies to solicitations where the contract value is expected to exceed the simplified acquisition threshold.

(viii) 52.209-11, Representation by Corporations Regarding Delinquent Tax Liability or a Felony Conviction under any Federal Law. This provision applies to all solicitations.

(ix) 52.214-14, Place of Performance-Sealed Bidding. This provision applies to invitations for bids except those in which the place of performance is specified by the Government.

(x) 52.215-6, Place of Performance. This provision applies to solicitations unless the place of performance is specified by the Government.

(xi) 52.219-1, Small Business Program Representations (Basic & Alternate I). This provision applies to solicitations when the contract will be performed in the United States or its outlying areas.
(A) The basic provision applies when the solicitations are issued by other than DoD, NASA, and the Coast Guard.
(B) The provision with its Alternate I applies to solicitations issued by DoD, NASA, or the Coast Guard.

(xii) 52.219-2, Equal Low Bids. This provision applies to solicitations when contracting by sealed bidding and the contract will be performed in the United States or its outlying areas.

(xl) 52.222-22, Previous Contracts and Compliance Reports. This provision applies to solicitations that include the clause at 52.222-26, Equal Opportunity.

(xiv) 52.222-25, Affirmative Action Compliance. This provision applies to solicitations, other than those for construction, when the solicitation includes the clause at 52.222-26, Equal Opportunity.

(xv) 52.222-38, Compliance with Veterans' Employment Reporting Requirements. This provision applies to solicitations when it is anticipated the contract award will exceed the simplified acquisition threshold and the contract is not for acquisition of commercial items.

(xvi) 52.222-57, Representation Regarding Compliance with Labor Laws (Executive Order 13673). This provision applies to solicitations expected to exceed $50 million which are issued from October 25, 2016 through April 24, 2017, and solicitations expected to exceed $500,000, which are issued after April 24, 2017.

Note to paragraph (c)(1)(xv): By a court order issued on October 24, 2016, 52.222-57 is enjoined indefinitely as of the date of the order. The enjoined paragraph will become effective immediately if the court terminates the injunction. At that time, GSA, DoD and NASA will publish a document in the Federal Register advising the public of the termination of the injunction.
(xvii) 52.223-1, Biobased Product Certification. This provision applies to
solicitations that require the delivery or specify the use of
USDA-designated items; or include the clause at 52.223-2, Affirmative
Procurement of Biobased Products Under Service and Construction Contracts.
(xviii) 52.223-4, Recovered Material Certification. This provision applies
to solicitations that are for, or specify the use of, EPA-designated (xix)
52.223-22, Public Disclosure of Greenhouse Gas Emissions and Reduction
Goals—Representation. This provision applies to solicitation that include
the clause at 52.204-7.items.

(xx) 52.225-2, Buy American Certificate. This provision applies to
solicitations containing the clause at 52.225-1.
(xxi) 52.225-4, Buy American-Free Trade Agreements-Israeli Trade Act
Certificate. (Basic, Alternate I, II and III) This provision applies to
solicitations containing the clause at 52.225-3.
(A) If the acquisition value is less than $25,000, the basic provision
applies.
(B) If the acquisition value is $25,000 or more but is less than $50,000,
the provision with its Alternate I applies.
(C) If the acquisition value is $50,000 or more but is less than $77,533,
the provision with its Alternate II applies.
(D) If the acquisition value is $77,533 or more but is less than $100,000,
the provision with its Alternate III applies.
(xxii) 52.225-6, Trade Agreements Certificate. This provision applies to
solicitations containing the clause at 52.225-5.
(xxiii) 52.225-20, Prohibition on Conducting Restricted Business Operations
in Sudan—Certification. This provision applies to all solicitations.
(xxiv) 52.225-25, Prohibition on Contracting With Entities Engaging in
Certain Activities or Transactions Relating to Iran—Representations and
Certification. This provision applies to all solicitations.
(xxv) 52.226-2, Historically Black College or University and Minority
Institution Representation. This provision applies to solicitations for
research, studies, supplies, or services of the type normally acquired from
higher educational institutions.

(2) The following representations or certifications are applicable as
indicated by the Contracting Officer:
[Contracting Officer check as appropriate.]
__ (i) 52.204-17, Ownership or Control of Offeror.
__ (ii) 52.204-20, Predecessor of Offeror.
__ (iii) 52.222-18, Certification Regarding Knowledge of Child Labor for
Listed End Products.
__ (iv) 52.222-48, Exemption from Application of the Service Contract
Standards to Contracts for Maintenance, Calibration, or Repair of Certain
Equipment Certification.
__ (v) 52.222-52, Exemption from Application of the Service Contract
Standards to Contracts for Certain Services—Certification.
__ (vi) 52.223-9, with its Alternate I, Estimate of Percentage of Recovered
Material Content for EPA-Designated Products (Alternate I only).
__ (vii) 52.227-6, Royalty Information.
__ (A) Basic.
__ (B) Alternate I.
__ (viii) 52.227-15, Representation of Limited Rights Data and Restricted
Computer Software.

d (d) The offeror has completed the annual representations and certifications
electronically via the SAM website accessed through
https://www.acquisition.gov. After reviewing the SAM database information,
the offeror verifies by submission of the offer that the representations
and certifications currently posted electronically that apply to this

solicitation as indicated in paragraph (c) of this provision have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

<table>
<thead>
<tr>
<th>PAR CLAUSE #</th>
<th>TITLE</th>
<th>DATE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on SAM.

(End of provision)

1.2 52.204-19 Incorporation By Reference Of Representations And Certifications (Dec 2014)

The Contractor’s representations and certifications, including those completed electronically via the System for Award Management (SAM), are incorporated by reference into the contract.

(End of clause)

1.3 52.209-7 Information Regarding Responsibility Matters (Jul 2013)

(a) Definitions. As used in this provision-
"Administrative proceeding" means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (e.g., Securities and Exchange Commission Administrative Proceedings, Civilian Board of Contract Appeals Proceedings, and Armed Services Board of Contract Appeals Proceedings). This includes administrative proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does not include agency actions such as contract audits, site visits, corrective plans, or inspection of deliverables.
"Federal contracts and grants with total value greater than $10,000,000" means-
(1) The total value of all current, active contracts and grants, including all priced options; and
(2) The total value of all current, active orders including all priced options under indefinite-delivery, indefinite-quantity, 8(a), or requirements contracts (including task and delivery and multiple-award Schedules).
"Principal" means an officer, director, owner, partner, or a person having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a division or business segment; and similar positions).

(b) The offeror [ ] has [ ] does not have current active Federal contracts and grants with total value greater than $10,000,000.

(c) If the offeror checked "has" in paragraph (b) of this provision, the offeror represents, by submission of this offer, that the information it has entered in the Federal Awardee Performance and Integrity Information System (FAPIIS) is current, accurate, and complete as of the date of
submission of this offer with regard to the following information:

(1) Whether the offeror, and/or any of its principals, has or has not, within the last five years, in connection with the award to or performance by the offeror of a Federal contract or grant, been the subject of a proceeding, at the Federal or State level that resulted in any of the following dispositions:
   (i) In a criminal proceeding, a conviction.
   (ii) In a civil proceeding, a finding of fault and liability that results in the payment of a monetary fine, penalty, reimbursement, restitution, or damages of $5,000 or more.
   (iii) In an administrative proceeding, a finding of fault and liability that results in:
      (A) The payment of a monetary fine or penalty of $5,000 or more; or
      (B) The payment of a reimbursement, restitution, or damages in excess of $100,000.
   (iv) In a criminal, civil, or administrative proceeding, a disposition of the matter by consent or compromise with an acknowledgment of fault by the Contractor if the proceeding could have led to any of the outcomes specified in paragraphs (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this provision.

(2) If the offeror has been involved in the last five years in any of the occurrences listed in (c)(1) of this provision, whether the offeror has provided the requested information with regard to each occurrence.

(d) The offeror shall post the information in paragraphs (c)(1)(i) through (c)(1)(iv) of this provision in FAPIIS as required through maintaining an active registration in the System for Award Management database via https://www.acquisition.gov (see 52.204-7).

(End of provision)

1.4 FAR 52.209-12 Certification Regarding Tax Matters (Feb 2016)

(a) This provision implements section 523 of Division B of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235), and similar provisions, if contained in subsequent appropriations acts.

(b) If the Offeror is proposing a total contract price that will exceed $5,000,000 (including options), the Offeror shall certify that, to the best of its knowledge and belief, it

(1) Has [ ] filed all Federal tax returns required during the three years preceding the certification;

(2) Has not [ ] been convicted of a criminal offense under the Internal Revenue Code of 1986; and

(3) Has not [ ], more than 90 days prior to certification, been notified of any unpaid Federal tax assessment for which the liability remains unsatisfied, unless the assessment is the subject of an installment agreement or offer in compromise that has been approved by the Internal Revenue Service and is not in default, or the assessment is the subject of a non-frivolous administrative or judicial proceeding.

(End of provision)
"Commercial and Government Entity (CAGE) code" means—

(1) An identifier assigned to entities located in the United States or its outlying areas by the Defense Logistics Agency (DLA) Contractor and Government Entity (CAGE) Branch to identify a commercial or government entity, or

(2) An identifier assigned by a member of the North Atlantic Treaty Organization (NATO) or by the NATO Support Agency (NSPA) to entities located outside the United States and its outlying areas that the DLA Contractor and Government Entity (CAGE) Branch records and maintains in the CAGE master file. This type of code is known as an NCAGE code.

"Highest-level owner" means the entity that owns or controls an immediate owner of the offeror, or that owns or controls one or more entities that control an immediate owner of the offeror. No entity owns or exercises control of the highest level owner.

"Immediate owner" means an entity, other than the offeror, that has direct control of the offeror. Indicators of control include, but are not limited to, one or more of the following: ownership or interlocking management, identity of interests among family members, shared facilities and equipment, and the common use of employees.

(b) The Offeror represents that it o has or o does not have an immediate owner. If the Offeror has more than one immediate owner (such as a joint venture), then the Offeror shall respond to paragraph (c) and if applicable, paragraph (d) of this provision for each participant in the joint venture.

(c) If the Offeror indicates "has" in paragraph (b) of this provision, enter the following information:

   Immediate owner CAGE code: ____________________
   Immediate owner legal name: ______________________
   (Do not use a "doing business as" name)

   Is the immediate owner owned or controlled by another entity?: [ ] Yes or [ ] No.

(d) If the Offeror indicates "yes" in paragraph (c) of this provision, indicating that the immediate owner is owned or controlled by another entity, then enter the following information:

   Highest-level owner CAGE code: ____________________
   Highest-level owner legal name: ____________________
   (Do not use a "doing business as" name)

(End of provision)
1.6 52.236-28 Preparation of Proposals-Construction (Oct 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms; and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including-
(1) Lump sum price;
(2) Alternate prices;
(3) Units of construction; or
(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words "no proposal" in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission.

(End of provision)

1.7 DFARS 252.203-7005 Representation Relating To Compensation Of Former DOD Officials (Nov 2011)

(a) Definition. Covered DoD official is defined in the clause at 252.203-7000, Requirements Relating to Compensation of Former DoD Officials.
(b) By submission of this offer, the offeror represents, to the best of its knowledge and belief, that all covered DoD officials employed by or otherwise receiving compensation from the offeror, and who are expected to undertake activities on behalf of the offeror for any resulting contract, are presently in compliance with all post-employment restrictions covered by 18 U.S.C. 207, 41 U.S.C. 2101-2107, and 5 CFR parts 2637 and 2641, including Federal Acquisition Regulation 3.104-2.

(End of provision)

1.8 DFARS 252.204-7007 Alternate A, Annual Representations and Certifications (Jan 2015)

Substitute the following paragraphs (d) and (e) for paragraph (d) of the provision at FAR 52.204-8:

(d)(1) The following representations or certifications in the System for Award Management (SAM) database are applicable to this solicitation as indicated:

(i) 252.209-7003, Reserve Officer Training Corps and Military Recruiting on Campus-Representation. Applies to all solicitations with institutions of higher education.
(ii) 252.216-7008, Economic Price Adjustment-Wage Rates or Material Prices Controlled by a Foreign Government. Applies to solicitations for fixed-price supply and service contracts when the contract is to be performed wholly or in part in a foreign country, and a foreign government controls wage rates or material prices and may during contract performance impose a mandatory change in wages or prices of materials.
(iii) 252.222-7007, Representation Regarding Combating Trafficking in Persons, as prescribed in 222.1771. Applies to solicitations with a
value expected to exceed the simplified acquisition threshold.

(iv) 252.225-7042, Authorization to Perform. Applies to all
     solicitations when performance will be wholly or in part in a foreign
country.

(v) 252.225-7049, Prohibition on Acquisition of Commercial
     Satellite Services from Certain Foreign Entities--Representations. Applies
to solicitations for the acquisition of commercial satellite services.

(vi) 252.225-7050, Disclosure of Ownership or Control by the
     Government of a Country that is a State Sponsor of Terrorism. Applies to
     all solicitations expected to result in contracts of $150,000 or more

(vii) 252.229-7012, Tax Exemptions (Italy)--Representation. Applies
to solicitations and contracts when contract performance will be in Italy.

(viii) 252.229-7013, Tax Exemptions (Spain)--Representation. Applies
to solicitations and contracts when contract performance will be in Spain.

(ix) 252.247-7022, Representation of Extent of Transportation by
     Sea. Applies to all solicitations except those for direct purchase of ocean
     transportation services or those with an anticipated value at or below the
     simplified acquisition threshold.

(2) The following representations or certifications in SAM are
     applicable to this solicitation as indicated by the Contracting Officer:
[Contracting Officer check as appropriate.]

_x_ (i) 252.209-7002, Disclosure of Ownership or Control by a Foreign
     Government.


___ (iii) 252.225-7020, Trade Agreements Certificate.

___ Use with Alternate I.

_x_ (iv) 252.225-7031, Secondary Arab Boycott of Israel.

___ (v) 252.225-7035, Buy American-Free Trade Agreements-Balance of
     Payments Program Certificate.

___ Use with Alternate I.

___ Use with Alternate II.

___ Use with Alternate III.

___ Use with Alternate IV.

___ Use with Alternate V.

(e) The offeror has completed the annual representations and certifications
     electronically via the SAM website at https://www.acquisition.gov/. After
reviewing the SAM database information, the offeror verifies by submission
of the offer that the representations and certifications currently posted
electronically that apply to this solicitation as indicated in FAR
52.204-8(c) and paragraph (d) of this provision have been entered or
updated within the last 12 months, are current, accurate, complete, and
applicable to this solicitation (including the business size standard
applicable to the NAICS code referenced for this solicitation), as of the
date of this offer, and are incorporated in this offer by reference (see
PAR 4.1201); except for the changes identified below [offeror to insert
changes, identifying change by provision number, title, date]. These
amended representation(s) and/or certification(s) are also incorporated in
this offer and are current, accurate, and complete as of the date of this
offer.

FAR/DFARS Provision #   Title   Date   Change

Any changes provided by the offeror are applicable to this solicitation
only, and do not result in an update to the representations and
certifications located in the SAM database.
(End of provision)
1.9 252.209-7998 Representation Regarding Conviction Of A Felony Criminal Violation Under Any Federal Or State Law (Deviation 2012-O0007) (Mar 2012)

(a) In accordance with section 514 of Division H of the Consolidated Appropriations Act, 2012, none of the funds made available by that Act may be used to enter into a contract with any corporation that was convicted of a felony criminal violation under any Federal or State law within the preceding 24 months, where the awarding agency is aware of the conviction, unless the agency has considered suspension or debarment of the corporation and made a determination that this further action is not necessary to protect the interests of the Government.

(b) The Offeror represents that it is [ ] is not [ ] a corporation that was convicted of a felony criminal violation under a Federal or State law within the preceding 24 months.

(End of provision)

1.10 252.209-7999 Representation By Corporations Regarding An Unpaid Delinquent Tax Liability Or A Felony Conviction Under Any Federal Law (Deviation 2012-O0004) (Jan 2012)

(a) In accordance with sections 8124 and 8125 of Division A of the Consolidated Appropriations Act, 2012, (Pub. L. 112-74) none of the funds made available by that Act may be used to enter into a contract with any corporation that-

(1) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless the agency has considered suspension or debarment of the corporation and made a determination that this further action is not necessary to protect the interests of the Government.

(2) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless the agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government.

(b) The Offeror represents that-

(1) It is [ ___ ] is not [ ___ ] a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability,

(2) It is [ ___ ] is not [ ___ ] a corporation that was convicted of a felony criminal violation under a Federal law within the preceding 24 months.

(End of provision)
PART 2 NOT USED

PART 3 NOT USED

-- End of Section --
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DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 00 72 01

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1.2   *FAR 52.203-3   GRATUITIES (APR 1984)
1.3   *FAR 52.203-5   COVENANT AGAINST CONTINGENT FEES (MAY 2014)
1.4   *FAR 52.203-7   ANTI-KICKBACK PROCEDURES (MAY 2014)
1.5   *FAR 52.203-8   CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (MAY 2014)
1.6   *FAR 52.203-10  PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (MAY 2014)
1.7   *FAR 52.203-12  LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (OCT 2010)
1.8   *FAR 52.203-13  CONTRACTOR CODE OF BUSINESS ETHICS AND CONDUCT (OCT 2015)
1.9   RESERVED
1.10  RESERVED
1.11  *FAR 52.203-17  CONTRACTOR EMPLOYEE WHISTLEBLOWER RIGHTS AND REQUIREMENT TO INFORM EMPLOYEES OF WHISTLEBLOWER RIGHTS (APR 2014)
1.12  *FAR 52.203-19  PROHIBITION ON REQUIRING CERTAIN INTERNAL CONFIDENTIALITY AGREEMENTS OR STATEMENTS (JAN 2017)
1.13  *FAR 52.204-4   PRINTED OR COPIED DOUBLE-SIDED ON POSTCONSUMER FIBER CONTENT PAPER (MAY 2011)
1.14  RESERVED
1.15  FAR 52.204-9   PERSONAL IDENTITY VERIFICATION OF CONTRACTOR PERSONNEL (JAN 2011)
1.16  *FAR 52.204-10  REPORTING EXECUTIVE COMPENSATION AND FIRST-TIER SUBCONTRACT AWARDS (OCT 2016)
1.17  RESERVED
1.18  *FAR 52.204-12  UNIQUE ENTITY IDENTIFIER MAINTENANCE (OCT 2016)
1.19  *FAR 52.204-13  SYSTEM FOR AWARD MANAGEMENT MAINTENANCE (OCT 2016)
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1.21  *FAR 52.209-6   PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (OCT 2015)
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PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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1.1 *FAR 52.202-1  DEFINITIONS (NOV 2013)

When a solicitation provision or contract clause uses a word or term that is defined in the Federal Acquisition Regulation (FAR), the word or term has the same meaning as the definition in FAR 2.101 in effect at the time the solicitation was issued, unless-

(a) The solicitation, or amended solicitation, provides a different definition;
(b) The contracting parties agree to a different definition;
(c) The part, subpart, or section of the FAR where the provision or clause is prescribed provides a different meaning; or
(d) The word or term is defined in FAR Part 31, for use in the cost principles and procedures.
(End of clause)

1.2 *FAR 52.203-3  GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative--
   (1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and
   (2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.
(b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.
(c) If this contract is terminated under paragraph (a) above, the Government is entitled--
   (1) To pursue the same remedies as in a breach of the contract; and
   (2) In addition to any other damages provided by law, to exemplary damages of not less than 3 nor more than 10 times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)
(d) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.
(End of clause)

1.3 *FAR 52.203-5  COVENANT AGAINST CONTINGENT FEES (MAY 2014)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Government shall have the right to annul this contract without liability or to deduct from the contract price or consideration, or otherwise recover, the full amount
of the contingent fee.

(b) "Bona fide agency," as used in this clause, means an established commercial or selling agency, maintained by a contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee," as used in this clause, means a person, employed by a contractor and subject to the contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee," as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence," as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

(End of clause)

1.4 *FAR 52.203-7     ANTI-KICKBACK PROCEDURES (MAY 2014)

(a) Definitions.

"Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract. "Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

"Prime contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

"Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

"Prime Contractor employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

"Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

"Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher tier subcontractor.

"Subcontractor employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

(b) 41 U.S.C. chapter 87, Kickbacks, prohibits any person from--

(1) Providing or attempting to provide or offering to provide any kickback;

(2) Soliciting, accepting, or attempting to accept any kickback; or

(3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the
contract price charged by a subcontractor to a prime Contractor or higher tier subcontractor.

(1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Attorney General.

(3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.

(4) The Contracting Officer may
   (i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or
   (ii) direct that the Prime Contractor withhold from sums owed a subcontractor under the prime contract the amount of the kickback. The Contracting Officer may order that monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has already offset those monies under subdivision (c)(4)(i) of this clause. In either case, the Prime Contractor shall notify the Contracting Officer when the monies are withheld.

(5) The Contractor agrees to incorporate the substance of this clause, including subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract which exceed $150,000.

(End of clause)

1.5 FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (MAY 2014)

(a) If the Government receives information that a contractor or a person has violated 41 U.S.C. 2102-2104, Restrictions on Obtaining and Disclosing Certain Information, the Government may--
   (1) Cancel the solicitation, if the contract has not yet been awarded or issued; or
   (2) Rescind the contract with respect to which
      (i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27 (a) or (b) of the Act for the purpose of either
         (A) Exchanging the information covered by such subsections for anything of value; or
         (B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or
      (ii) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct violates 41 U.S.C. 2102 for the purpose of either--

(b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

(c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

(End of Provision)
1.6 *FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (MAY 2014)

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract by the amount of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of 41 U.S.C. 2102 or 2103, as implemented in section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may--

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the statute by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

(End of clause)

1.7 *FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (OCT 2010)

(a) Definitions. As used in this clause-

"Agency" means "executive agency" as defined in Federal Acquisition
Regulation (FAR) 2.101.

"Covered Federal action" means any of the following actions:

4. Entering into any cooperative agreement.
5. Extending, continuing, renewing, amending, or modifying any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization" have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b) and include Alaskan Natives.

"Influencing or attempting to influence" means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government" means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency" includes the following individuals who are employed by an agency:

1. An individual who is appointed to a position in the Government under Title 5, United States Code, including a position under a temporary appointment.
2. A member of the uniformed services, as defined in subsection 101(3), Title 37, United States Code.
3. A special Government employee, as defined in section 202, Title 18, United States Code.
4. An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, Title 5, United States Code, appendix 2.

"Person" means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization eligible to receive Federal contracts, grants, cooperative agreements, or loans from an agency, but only with respect to expenditures by such tribe or organization that are made for purposes specified in paragraph (b) of this clause and are permitted by other Federal law.

"Reasonable compensation" means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment" means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.
"Recipient" includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization eligible to receive Federal contracts, grants, cooperative agreements, or loans from an agency, but only with respect to expenditures by such tribe or organization that are made for purposes specified in paragraph (b) of this clause and are permitted by other Federal law.

"Regularly employed" means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State" means a State of the United States, the District of Columbia, or an outlying area of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibition. 31 U.S.C. 1352 prohibits a recipient of a Federal contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal actions. In accordance with 31 U.S.C. 1352 the Contractor shall not use appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the award of this contract the extension, continuation, renewal, amendment, or modification of this contract.

(1) The term appropriated funds does not include profit or fee from a covered Federal action.

(2) To the extent the Contractor can demonstrate that the Contractor has sufficient monies, other than Federal appropriated funds, the Government will assume that these other monies were spent for any influencing activities that would be unallowable if paid for with Federal appropriated funds.

(c) Exceptions. The prohibition in paragraph (b) of this clause does not apply under the following conditions:

(1) Agency and legislative liaison by Contractor employees. (i) Payment of reasonable compensation made to an officer or employee of the Contractor if the payment is for agency and legislative liaison activities not directly related to this contract. For purposes of this paragraph, providing any information specifically requested by an agency or Congress is permitted at any time.

(ii) Participating with an agency in discussions that are not related to a specific solicitation for any covered Federal action, but that concern-

(A) The qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities; or

(B) The application or adaptation of the person's products or services for an agency's use.
(iii) Providing prior to formal solicitation of any covered Federal action any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(iv) Participating in technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(v) Making capability presentations prior to formal solicitation of any covered Federal action by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(2) Professional and technical services. (i) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(ii) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(iii) As used in paragraph (c)(2) of this clause, "professional and technical services" are limited to advice and analysis directly applying any professional or technical discipline (for examples, see FAR 3.803(a)(2)(iii)).

(iv) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(3) Only those communications and services expressly authorized by paragraphs (c)(1) and (2) of this clause are permitted.

(d) Disclosure. (1) If the Contractor did not submit OMB Standard Form LLL, Disclosure of Lobbying Activities, with its offer, but registrants under the Lobbying Disclosure Act of 1995 have subsequently made a lobbying contact on behalf of the Contractor with respect to this contract, the Contractor shall complete and submit OMB Standard Form LLL to provide the name of the lobbying registrants, including the individuals performing the services.

(2) If the Contractor did submit OMB Standard Form LLL disclosure pursuant to paragraph (d) of the provision at FAR 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions, and a change occurs that affects Block 10 of the OMB Standard Form LLL (name and address of lobbying registrant or individuals performing services), the Contractor shall, at the end of the calendar quarter in which the change occurs, submit to the Contracting Officer within 30 days an updated disclosure using OMB Standard Form LLL.

(e) Penalties. (1) Any person who makes an expenditure prohibited under paragraph (b) of this clause or who fails to file or amend the disclosure to be filed or amended by paragraph (d) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition
of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(2) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(f) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

(g) Subcontracts. (1) The Contractor shall obtain a declaration, including the certification and disclosure in paragraphs (c) and (d) of the provision at FAR 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions, from each person requesting or receiving a subcontract exceeding $150,000 under this contract. The Contractor or subcontractor that awards the subcontract shall retain the declaration.

(2) A copy of each subcontractor disclosure form (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall, at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor, submit to the Contracting Officer within 30 days a copy of all disclosures. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(3) The Contractor shall include the substance of this clause, including this paragraph (g), in any subcontract exceeding $150,000.

(End of clause)

1.8 *FAR 52.203-13 CONTRACTOR CODE OF BUSINESS ETHICS AND CONDUCT (OCT 2015)

(a) Definitions. As used in this clause-

"Agent" means any individual, including a director, an officer, an employee, or an independent Contractor, authorized to act on behalf of the organization.

"Full cooperation" -- (1) Means disclosure to the Government of the information sufficient for law enforcement to identify the nature and extent of the offense and the individuals responsible for the conduct. It includes providing timely and complete response to Government auditors' and investigators' request for documents and access to employees with information;

(2) Does not foreclose any Contractor rights arising in law, the FAR, or the terms of the contract. It does not require-

(i) A Contractor to waive its attorney-client privilege or the protections afforded by the attorney work product doctrine; or

(ii) Any officer, director, owner, or employee of the Contractor, including a sole proprietor, to waive his or her attorney client privilege or Fifth Amendment rights; and

(3) Does not restrict a Contractor from-

(i) Conducting an internal investigation; or

(ii) Defending a proceeding or dispute arising under the contract or related to a potential or disclosed violation.

"Principal" means an officer, director, owner, partner, or a person having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment; and similar positions).

"Subcontract" means any contract entered into by a subcontractor to
furnish supplies or services for performance of a prime contract or a subcontract.

"Subcontractor" means any supplier, distributor, vendor, or firm that furnished supplies or services to or for a prime contractor or another subcontractor.

"United States," means the 50 States, the District of Columbia, and outlying areas.

(b) Code of business ethics and conduct. (1) Within 30 days after contract award, unless the Contracting Officer establishes a longer time period, the Contractor shall-
   (i) Have a written code of business ethics and conduct; and
   (ii) Make a copy of the code available to each employee engaged in performance of the contract.

(2) The Contractor shall-
   (i) Exercise due diligence to prevent and detect criminal conduct; and
   (ii) Otherwise promote an organizational culture that encourages ethical conduct and a commitment to compliance with the law.

(3)(i) The Contractor shall timely disclose, in writing, to the agency Office of the Inspector General (OIG), with a copy to the Contracting Officer, whenever, in connection with the award, performance, or closeout of this contract or any subcontract thereunder, the Contractor has credible evidence that a principal, employee, agent, or subcontractor of the Contractor has committed-
   (A) A violation of Federal criminal law involving fraud, conflict of interest, bribery, or gratuity violations found in Title 18 of the United States Code; or
   (B) A violation of the civil False Claims Act (31 U.S.C. 3729-3733).

(ii) The Government, to the extent permitted by law and regulation, will safeguard and treat information obtained pursuant to the Contractor's disclosure as confidential where the information has been marked "confidential" or "proprietary" by the company. To the extent permitted by law and regulation, such information will not be released by the Government to the public pursuant to a Freedom of Information Act request, 5 U.S.C. Section 552, without prior notification to the Contractor. The Government may transfer documents provided by the Contractor to any department or agency within the Executive Branch if the information relates to matters within the organization's jurisdiction.

(iii) If the violation relates to an order against a Governmentwide acquisition contract, a multi-agency contract, a multiple-award schedule contract such as the Federal Supply Schedule, or any other procurement instrument intended for use by multiple agencies, the Contractor shall notify the OIG of the ordering agency and the IG of the agency responsible for the basic contract.

(c) Business ethics awareness and compliance program and internal control system. This paragraph (c) does not apply if the Contractor has represented itself as a small business concern pursuant to the award of this contract or if this contract is for the acquisition of a commercial item as defined at FAR 2.101. The Contractor shall establish the following within 90 days after contract award, unless the Contracting Officer establishes a longer time period:

(1) An ongoing business ethics awareness and compliance program.
   (i) This program shall include reasonable steps to communicate periodically and in a practical manner the Contractor's standards and procedures and other aspects of the Contractor's business ethics awareness and compliance program and internal control system, by
conducting effective training programs and otherwise disseminating information appropriate to an individual's respective roles and responsibilities.

(ii) The training conducted under this program shall be provided to the Contractor's principals and employees, and as appropriate, the Contractor's agents and subcontractors.

(2) An internal control system.

(i) The Contractor's internal control system shall-

(A) Establish standards and procedures to facilitate timely discovery of improper conduct in connection with Government contracts; and

(B) Ensure corrective measures are promptly instituted and carried out.

(ii) At a minimum, the Contractor's internal control system shall provide for the following:

(A) Assignment of responsibility at a sufficiently high level and adequate resources to ensure effectiveness of the business ethics awareness and compliance program and internal control system.

(B) Reasonable efforts not to include an individual as a principal, whom due diligence would have exposed as having engaged in conduct that is in conflict with the Contractor's code of business ethics and conduct.

(C) Periodic reviews of company business practices, procedures, policies, and internal controls for compliance with the Contractor's code of business ethics and conduct and the special requirements of Government contracting, including-

(1) Monitoring and auditing to detect criminal conduct;

(2) Periodic evaluation of the effectiveness of the business ethics awareness and compliance program and internal control system, especially if criminal conduct has been detected; and

(3) Periodic assessment of the risk of criminal conduct, with appropriate steps to design, implement, or modify the business ethics awareness and compliance program and the internal control system as necessary to reduce the risk of criminal conduct identified through this process.

(D) An internal reporting mechanism, such as a hotline, which allows for anonymity or confidentiality, by which employees may report suspected instances of improper conduct, and instructions that encourage employees to make such reports.

(E) Disciplinary action for improper conduct or for failing to take reasonable steps to prevent or detect improper conduct.

(F) Timely disclosure, in writing, to the agency OIG, with a copy to the Contracting Officer, whenever, in connection with the award, performance, or closeout of any Government contract performed by the Contractor or a subcontract thereunder, the Contractor has credible evidence that a principal, employee, agent, or subcontractor of the Contractor has committed a violation of Federal criminal law involving fraud, conflict of interest, bribery, or gratuity violations found in Title 18 U.S.C. or a violation of the civil False Claims Act (31 U.S.C. 3729-3733).

(1) If a violation relates to more than one Government contract, the Contractor may make the disclosure to the agency OIG and Contracting Officer responsible for the largest dollar value contract impacted by the violation.

(2) If the violation relates to an order against a Governmentwide acquisition contract, a multi-agency contract, a multiple-award schedule contract such as the Federal Supply Schedule, or any other procurement instrument intended for use by multiple agencies, the
contractor shall notify the OIG of the ordering agency and the IG of the agency responsible for the basic contract, and the respective agencies' contracting officers.

(3) The disclosure requirement for an individual contract continues until at least 3 years after final payment on the contract.

(4) The Government will safeguard such disclosures in accordance with paragraph (b)(3)(ii) of this clause.

(G) Full cooperation with any Government agencies responsible for audits, investigations, or corrective actions.

(d) Subcontracts. (1) The Contractor shall include the substance of this clause, including this paragraph (d), in subcontracts that have a value in excess of $5,500,000 and a performance period of more than 120 days.

(2) In altering this clause to identify the appropriate parties, all disclosures of violation of the civil False Claims Act or of Federal criminal law shall be directed to the agency Office of the Inspector General, with a copy to the Contracting Officer.

(End of clause)

1.9 RESERVED

1.10 RESERVED

1.11 *FAR 52.203-17 CONTRACTOR EMPLOYEE WHISTLEBLOWER RIGHTS AND REQUIREMENT TO INFORM EMPLOYEES OF WHISTLEBLOWER RIGHTS (APR 2014)

(a) This contract and employees working on this contract will be subject to the whistleblower rights and remedies in the pilot program on Contractor employee whistleblower protections established at 41 U.S.C. 4712 by section 828 of the National Defense Authorization Act for Fiscal Year 2013 (Pub. L. 112-239) and FAR 3.908.

(b) The Contractor shall inform its employees in writing, in the predominant language of the workforce, of employee whistleblower rights and protections under 41 U.S.C. 4712, as described in section 3.908 of the Federal Acquisition Regulation.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in all subcontracts over the simplified acquisition threshold.

(End of clause)

1.12 *FAR 52.203-19 PROHIBITION ON REQUIRING CERTAIN INTERNAL CONFIDENTIALITY AGREEMENTS OR STATEMENTS (JAN 2017)

(a) Definitions. As used in this clause-

"Internal confidentiality agreement or statement" means a confidentiality agreement or any other written statement that the contractor requires any of its employees or subcontractors to sign regarding nondisclosure of contractor information, except that it does not include confidentiality agreements arising out of civil litigation or confidentiality agreements that contractor employees or subcontractors sign at the behest of a Federal agency.

"Subcontract" means any contract as defined in subpart 2.1 entered into by a subcontractor to furnish supplies or services for performance of a prime contract or a subcontract. It includes but is not limited to purchase
orders, and changes and modifications to purchase orders.

"Subcontractor" means any supplier, distributor, vendor, or firm (including a consultant) that furnishes supplies or services to or for a prime contractor or another subcontractor.

(b) The Contractor shall not require its employees or subcontractors to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting waste, fraud, or abuse related to the performance of a Government contract to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information (e.g., agency Office of the Inspector General).

(c) The Contractor shall notify current employees and subcontractors that prohibitions and restrictions of any preexisting internal confidentiality agreements or statements covered by this clause, to the extent that such prohibitions and restrictions are inconsistent with the prohibitions of this clause, are no longer in effect.

(d) The prohibition in paragraph (b) of this clause does not contravene requirements applicable to Standard Form 312 (Classified Information Nondisclosure Agreement), Form 4414 (Sensitive Compartmented Information Nondisclosure Agreement), or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(e) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015, (Pub. L. 113-235), and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions) use of funds appropriated (or otherwise made available) is prohibited, if the Government determines that the Contractor is not in compliance with the provisions of this clause.

(f) The Contractor shall include the substance of this clause, including this paragraph (f), in subcontracts under such contracts.

(End of clause)

1.13  *FAR 52.204-4  PRINTED OR COPIED DOUBLE-SIDED ON POSTCONSUMER FIBER CONTENT PAPER (MAY 2011)

(a) Definitions. As used in this clause-

"Postconsumer fiber" means-

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

(b) The Contractor is required to submit paper documents, such as offers, letters, or reports that are printed or copied double-sided on paper containing at least 30 percent postconsumer fiber, whenever practicable, when not using electronic commerce methods to submit information or data to the Government.
1.14 RESERVED.

1.15 FAR 52.204-9 PERSONAL IDENTITY VERIFICATION OF CONTRACTOR PERSONNEL (JAN 2011)


(b) The Contractor shall account for all forms of Government-provided identification issued to the Contractor employees in connection with performance under this contract. The Contractor shall return such identification to the issuing agency at the earliest of any of the following, unless otherwise determined by the Government:

(1) When no longer needed for contract performance.
(2) Upon completion of the Contractor employee's employment.
(3) Upon contract completion or termination.

(c) The Contracting Officer may delay final payment under a contract if the Contractor fails to comply with these requirements.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in all subcontracts when the subcontractor's employees are required to have routine physical access to a Federally-controlled facility and/or routine access to a Federally-controlled information system. It shall be the responsibility of the prime Contractor to return such identification to the issuing agency in accordance with the terms set forth in paragraph (b) of this section, unless otherwise approved in writing by the Contracting Officer.

(End of clause)

1.16 *FAR 52.204-10 REPORTING EXECUTIVE COMPENSATION AND FIRST-TIER SUBCONTRACT AWARDS (OCT 2016)

(a) Definitions. As used in this clause:

"Executive" means officers, managing partners, or any other employees in management positions.

"First-tier subcontract" means a subcontract awarded directly by the Contractor for the purpose of acquiring supplies or services (including construction) for performance of a prime contract. It does not include the Contractor's supplier agreements with vendors, such as long-term arrangements for materials or supplies that benefit multiple contracts and/or the costs of which are normally applied to a Contractor's general and administrative expenses or indirect costs.

"Months of award" means the month in which a contract is signed by the Contracting Officer or the month in which a first-tier subcontract is signed by the Contractor.

"Total compensation" means the cash and noncash dollar value earned by the executive during the Contractor's preceding fiscal year and includes the following (for more information see 17 CFR 229.402(c)(2)):

(1) Salary and bonus.
(2) Awards of stock, stock options, and stock appreciation rights. Use the dollar amount recognized for financial statement reporting purposes with respect to the fiscal year in accordance with the Financial
Accounting Standards Board's Accounting Standards Codification (FASB ASC) 718, Compensation- Stock Compensation.

(3) Earnings for services under non-equity incentive plans. This does not include group life, health, hospitalization or medical reimbursement plans that do not discriminate in favor of executives, and are available generally to all salaried employees.

(4) Change in pension value. This is the change in present value of defined benefit and actuarial pension plans.

(5) Above-market earnings on deferred compensation which is not tax-qualified.

(6) Other compensation, if the aggregate value of all such other compensation (e.g., severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the executive exceeds $10,000.

(b) Section 2(d)(2) of the Federal Funding Accountability and Transparency Act of 2006 (Pub. L. 109-282), as amended by section 6202 of the Government Funding Transparency Act of 2008 (Pub. L. 110-252), requires the Contractor to report information on subcontract awards. The law requires all reported information be made public, therefore, the Contractor is responsible for notifying its subcontractors that the required information will be made public.

(c) Nothing in this clause requires the disclosure of classified information.

(d)(1) Executive compensation of the prime contractor. As a part of its annual registration requirement in the System for Award Management (SAM) database (FAR provision 52.204-7), the Contractor shall report the names and total compensation of each of the five most highly compensated executives for its preceding completed fiscal year, if-

(i) In the Contractor's preceding fiscal year, the Contractor received-

(A) 80 percent or more of its annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants), cooperative agreements, and other forms of Federal financial assistance; and

(B) $25,000,000 or more in annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants), cooperative agreements, and other forms of Federal financial assistance; and

(ii) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at http://www.sec.gov/answers/execomp.htm.)

(2) First-Tier subcontract information. Unless otherwise directed by the contracting officer, or as provided in paragraph (h) of this clause, by the end of the month following the month of award of a first-tier subcontract with a value of $30,000 or more, the Contractor shall report the following information at http://www.fsrs.gov for that first-tier subcontract. (The Contractor shall follow the instructions at http://www.fsrs.gov to report the data.)

(i) Unique entity identifier for the subcontractor receiving the award and for the subcontractor's parent company, if the subcontractor has a parent company.

(ii) Name of the subcontractor.

(iii) Amount of the subcontract award.

(iv) Date of the subcontract award.
(v) A description of the products or services (including construction) being provided under the subcontract, including the overall purpose and expected outcomes or results of the subcontract.

(vi) Subcontract number (the subcontract number assigned by the Contractor).

(vii) Subcontractor's physical address including street address, city, state, and country. Also include the nine-digit zip code and congressional district.

(viii) Subcontractor's primary performance location including street address, city, state, and country. Also include the nine-digit zip code and congressional district.

(ix) The prime contract number, and order number if applicable.

(x) Awarding agency name and code.

(xi) Funding agency name and code.

(xii) Government contracting office code.

(xiii) Treasury account symbol (TAS) as reported in FPDS.

(xiv) The applicable North American Industry Classification System code (NAICS).

(3) Executive compensation of the first-tier subcontractor. Unless otherwise directed by the Contracting Officer, by the end of the month following the month of award of a first-tier subcontract with a value of $30,000 or more, and annually thereafter (calculated from the prime contract award date), the Contractor shall report the names and total compensation of each of the five most highly compensated executives for that first-tier subcontractor for the first-tier subcontractor's preceding completed fiscal year at http://www.fsrs.gov, if-

(i) In the subcontractor's preceding fiscal year, the subcontractor received-

(A) 80 percent or more of its annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants), cooperative agreements, and other forms of Federal financial assistance; and

(B) $25,000,000 or more in annual gross revenues from Federal contracts (and subcontracts), loans, grants (and subgrants), cooperative agreements, and other forms of Federal financial assistance; and

(ii) The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at http://www.sec.gov/answers/execomp.htm.)

(e) The Contractor shall not split or break down first-tier subcontract awards to a value less than $30,000 to avoid the reporting requirements in paragraph (d) of this clause.

(f) The Contractor is required to report information on a first-tier subcontract covered by paragraph (d) when the subcontract is awarded. Continued reporting on the same subcontract is not required unless one of the reported data elements changes during the performance of the subcontract. The Contractor is not required to make further reports after the first-tier subcontract expires.

(g)(1) If the Contractor in the previous tax year had gross income, from all sources, under $300,000, the Contractor is exempt from the requirement to report subcontractor awards.

(2) If a subcontractor in the previous tax year had gross income from all sources under $300,000, the Contractor does not need to
report awards for that subcontractor.

(h) The FSRS database at http://www.fsrs.gov will be prepopulated with some information from SAM and FPDS databases. If FPDS information is incorrect, the contractor should notify the contracting officer. If the SAM database information is incorrect, the contractor is responsible for correcting this information.
(End of clause)

1.17  RESERVED

1.18  *FAR 52.204-12  UNIQUE ENTITY IDENTIFIER MAINTENANCE (OCT 2016)

(a) Definition. “Unique entity identifier”, as used in this clause, means a number or other identifier used to identify a specific commercial, nonprofit, or Government entity. See www.sam.gov for the designated entity for establishing unique entity identifiers.

(b) The Contractor shall ensure that the unique entity identifier is maintained with the entity designated at the System for Award Management (SAM) for establishment of the unique entity identifier throughout the life of the contract. The Contractor shall communicate any change to the unique entity identifier to the Contracting Officer within 30 days after the change, so an appropriate modification can be issued to update the data on the contract. A change in the unique entity identifier does not necessarily require a novation be accomplished.-
(End of clause)

1.19  *FAR 52.204-13  SYSTEM FOR AWARD MANAGEMENT MAINTENANCE (OCT 2016)

(a) Definitions. As used in this clause-

"Electronic Funds Transfer (EFT) indicator" means a fourcharacter suffix to the unique entity identifier. The suffix is assigned at the discretion of the commercial, nonprofit, or Government entity to establish additional System for Award Management (SAM) records for identifying alternative EFT accounts (see subpart 32.11) for the same entity.

"Registered in the System for Award Management (SAM) database" means that -

(1) The Contractor has entered all mandatory information, including the unique entity identifier and the EFT indicator (if applicable), the Commercial and Government Entity (CAGE) code, as well as data required by the Federal Funding Accountability and Transparency Act of 2006 (see subpart 4.14), into the SAM database;
(2) The Contractor has completed the Core, Assertions, Representations and Certifications, and Points of Contact sections of the registration in the SAM database;
(3) The Government has validated all mandatory data fields, to include validation of the Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS). The Contractor will be required to provide consent for TIN validation to the Government as a part of the SAM registration process; and
(4) The Government has marked the record "Active".

"System for Award Management (SAM)" means the primary Government repository for prospective Federal awardee and Federal awardee information and the
centralized Government system for certain contracting, grants, and other assistance-related processes. It includes:

(1) Data collected from prospective Federal awardees required for the conduct of business with the Government;
(2) Prospective contractor-submitted annual representations and certifications in accordance with FAR Subpart 4.14; and
(3) Identification of those parties excluded from receiving Federal contracts, certain subcontracts, and certain types of Federal financial and non-financial assistance and benefits.

"Unique entity identifier" means a number or other identifier used to identify a specific commercial, nonprofit, or Government entity. See www.sam.gov for the designated entity for establishing unique entity identifiers.

(b) The Contractor is responsible for the accuracy and completeness of the data within the SAM database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the SAM database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the SAM database to ensure it is current, accurate and complete. Updating information in the SAM does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document.

(c) (1) (i) If a Contractor has legally changed its business name, doing business as name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of-name agreements in subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to-

(A) Change the name in the SAM database;
(B) Comply with the requirements of subpart 42.12 of the FAR; and
(C) Agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor shall provide with the notification sufficient documentation to support the legally changed name.

(ii) If the Contractor fails to comply with the requirements of paragraph (c)(1)(i) of this clause, or fails to perform the agreement at paragraph (c)(1)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of-name agreement, the SAM information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the "Suspension of Payment" paragraph of the electronic funds transfer (EFT) clause of this contract.

(2) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the SAM record to reflect an assignee for the purpose of assignment of claims (see FAR subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the SAM database. Information provided to the Contractor's SAM record that indicates payments, including those made by EFT, to an ultimate recipient other than that Contractor will be considered to be incorrect information within the meaning of the "Suspension of Payment" paragraph of the EFT clause of this contract.

(3) The Contractor shall ensure that the unique entity identifier is maintained with the entity designated at www.sam.gov for establishment of the unique entity identifier throughout the life of the
contract. The Contractor shall communicate any change to the unique entity identifier to the Contracting Officer within 30 days after the change, so an appropriate modification can be issued to update the data on the contract. A change in the unique entity identifier does not necessarily require a novation be accomplished.

(d) Contractors may obtain additional information on registration and annual confirmation requirements at https://www.acquisition.gov.

(End of clause)

1.20 *FAR 52.204-18 COMMERCIAL AND GOVERNMENT ENTITY CODE MAINTENANCE (JUL 2016)

(a) Definition. As used in this clause-

"Commercial and Government Entity (CAGE) code" means—

(1) An identifier assigned to entities located in the United States or its outlying areas by the Defense Logistics Agency (DLA) Commercial and Government Entity (CAGE) Branch to identify a commercial or government entity; or

(2) An identifier assigned by a member of the North Atlantic Treaty Organization (NATO) or by the NATO Support and Procurement Agency (NSPA) to entities located outside the United States and its outlying areas that the DLA Commercial and Government Entity (CAGE) Branch records and maintains in the CAGE master file. This type of code is known as a NATO CAGE (NCAGE) code.

(b) Contractors shall ensure that the CAGE code is maintained throughout the life of the contract. For contractors registered in the System for Award Management (SAM), the DLA Commercial and Government Entity (CAGE) Branch shall only modify data received from SAM in the CAGE master file if the contractor initiates those changes via update of its SAM registration. Contractors undergoing a novation or change-of-name agreement shall notify the contracting officer in accordance with Subpart 42.12. The contractor shall communicate any change to the CAGE code to the contracting officer within 30 days after the change, so that a modification can be issued to update the CAGE code on the contract.

(c) Contractors located in the United States or its outlying areas that are not registered in SAM shall submit written change requests to the DLA Commercial and Government Entity (CAGE) Branch. Requests for changes shall be provided at https://cage.dla.mil. Change requests to the CAGE master file are accepted from the entity identified by the code.

(d) Contractors located outside the United States and its outlying areas that are not registered in SAM shall contact the appropriate National Codification Bureau (points of contact available at http://www.nato.int/structur/AC/135/main/links/contacts.htm) or NSPA at https://eportal.nspa.nato.int/AC135Public/scage/CageList.aspx to request CAGE changes.

(e) Additional guidance for maintaining CAGE codes is available at https://cage.dla.milp.

(End of clause)
1.21 *FAR 52.209-6  PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (OCT 2015)

(a) Definition. "Commercially available off-the-shelf (COTS)" item, as used in this clause-
(1) Means any item of supply (including construction material) that is-
   (i) A commercial item (as defined in paragraph (1) of the definition in FAR 2.101);
   (ii) Sold in substantial quantities in the commercial marketplace; and
   (iii) Offered to the Government, under a contract or subcontract at any tier, without modification, in the same form in which it is sold in the commercial marketplace; and
(2) Does not include bulk cargo, as defined in 46 U.S.C. 40102(4), such as agricultural products and petroleum products.
(b) The Government suspends or debars Contractors to protect the Government's interests. Other than a subcontract for a commercially available off-the-shelf item, the Contractor shall not enter into any subcontract, in excess of $35,000 with a Contractor that is debarred, suspended, or proposed for debarment by any executive agency unless there is a compelling reason to do so.
(c) The Contractor shall require each proposed subcontractor whose subcontract will exceed $35,000, other than a subcontractor providing a commercially available off-the-shelf item, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principals, is or is not debarred, suspended, or proposed for debarment by the Federal Government.
(d) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party (other than a subcontractor providing a commercially available off-the-shelf item) that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the System for Award Management (SAM) Exclusions). The notice must include the following:
   (1) The name of the subcontractor.
   (2) The Contractor's knowledge of the reasons for the subcontractor being listed with an exclusion in SAM.
   (3) The compelling reason(s) for doing business with the subcontractor notwithstanding its being listed with an exclusion in SAM.
   (4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension, or proposed debarment.
(e) Subcontracts. Unless this is a contract for the acquisition of commercial items, the Contractor shall include the requirements of this clause, including this paragraph (e) (appropriately modified for the identification of the parties), in each subcontract that-
(1) Exceeds $35,000 in value; and
(2) Is not a subcontract for commercially available off-the-shelf items.
(End of clause)

1.22 FAR 52.209-9 UPDATES OF PUBLICLY AVAILABLE INFORMATION REGARDING RESPONSIBILITY MATTERS (JUL 2013)

(a) The Contractor shall update the information in the Federal Awardee Performance and Integrity Information System (FAPIIS) on a semi-annual basis, throughout the life of the contract, by posting the
required information in the System for Award Management database at https://www.acquisition.gov.

(b) As required by section 3010 of the Supplemental Appropriations Act, 2010 (Pub. L. 111-212), all information posted in FAPIIS on or after April 15, 2011, except past performance reviews, will be publicly available. FAPIIS consists of two segments-

(1) The non-public segment, into which Government officials and the Contractor post information, which can only be viewed by-

(i) Government personnel and authorized users performing business on behalf of the Government; or

(ii) The Contractor, when viewing data on itself; and

(2) The publicly-available segment, to which all data in the non-public segment of FAPIIS is automatically transferred after a waiting period of 14 calendar days, except for-

(i) Past performance reviews required by subpart 42.15;

(ii) Information that was entered prior to April 15, 2011; or

(iii) Information that is withdrawn during the 14-calendar-day waiting period by the Government official who posted it in accordance with paragraph (c)(1) of this clause.

(c) The Contractor will receive notification when the Government posts new information to the Contractor's record.

(1) If the Contractor asserts in writing within 7 calendar days, to the Government official who posted the information, that some of the information posted to the non-public segment of FAPIIS is covered by a disclosure exemption under the Freedom of Information Act, the Government official who posted the information must within 7 calendar days remove the posting from FAPIIS and resolve the issue in accordance with agency Freedom of Information procedures, prior to reposting the releasable information. The contractor must cite 52.209-9 and request removal within 7 calendar days of the posting to FAPIIS.

(2) The Contractor will also have an opportunity to post comments regarding information that has been posted by the Government. The comments will be retained as long as the associated information is retained, i.e., for a total period of 6 years. Contractor comments will remain a part of the record unless the Contractor revises them.

(3) As required by section 3010 of Pub. L. 111-212, all information posted in FAPIIS on or after April 15, 2011, except past performance reviews, will be publicly available.

(d) Public requests for system information posted prior to April 15, 2011, will be handled under Freedom of Information Act procedures, including, where appropriate, procedures promulgated under E.O. 12600.

(End of clause)

1.23 *FAR  52.209-10    PROHIBITION ON CONTRACTING WITH INVERTED DOMESTIC CORPORATIONS (NOV 2015)

(a) Definitions. As used in this clause-

"Inverted domestic corporation" means a foreign incorporated entity which is treated as an inverted domestic corporation under 6 U.S.C. 395(b), applied in accordance with the rules and definitions of 6 U.S.C. 395(c).

"Subsidiary" means an entity in which more than 50 percent of the entity is owned-

(1) Directly by a parent corporation; or

(2) Through another subsidiary of a parent corporation.

(b) If the contractor reorganizes as an inverted domestic corporation or becomes a subsidiary of an inverted domestic corporation at any time
during the period of performance of this contract, the Government may be prohibited from paying for Contractor activities performed after the date when it becomes an inverted domestic corporation or subsidiary. The Government may seek any available remedies in the event the Contractor fails to perform in accordance with the terms and conditions of the contract as a result of Government action under this clause.  
(c) Exceptions to this prohibition are located at 9.108-2.  
(d) In the event the Contractor becomes either an inverted domestic corporation, or a subsidiary of an inverted domestic corporation during contract performance, the Contractor shall give written notice to the Contracting Officer within five business days from the date of the inversion event.  
(End of clause)

1.24  *FAR 52.210-1 MARKET RESEARCH (APR 2011)  For Contracts exceeding $5,500,000

(a) Definition. As used in this clause-
"Commercial item" and "nondevelopmental item" have the meaning contained in Federal Acquisition Regulation 2.101.

(b) Before awarding subcontracts over the simplified acquisition threshold for items other than commercial items, the Contractor shall conduct market research to-

(1) Determine if commercial items or, to the extent commercial items suitable to meet the agency's needs are not available, nondevelopmental items are available that-

(ii) Could be modified to meet the agency's requirements; or

(iii) Could meet the agency's requirements if those requirements were modified to a reasonable extent; and

(2) Determine the extent to which commercial items or nondevelopmental items could be incorporated at the component level.  
(End of clause)

1.25  FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (APR 2008)

This is a rated order certified for national defense, emergency preparedness, and energy program use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 700).  
(End of clause)

1.26  FAR 52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)

If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to
cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgment of the Contracting Officer, is justified. (End of clause)

1.27 *FAR 52.215-2 AUDIT AND RECORDS--NEGOTIATION (OCT 2010)

(a) As used in this clause, "records" includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Examination of costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price redeterminable contract, or any combination of these, the Contractor shall maintain and the Contracting Officer, or an authorized representative of the Contracting Officer, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this contract. This right of examination shall include inspection at all reasonable times of the Contractor's plants, or parts of them, engaged in performing the contract.

(c) Cost or pricing data. If the Contractor has been required to submit cost or pricing data in connection with any pricing action relating to this contract, the Contracting Officer, or an authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to-

(1) The proposal for the contract, subcontract, or modification;

(2) The discussions conducted on the proposal(s), including those related to negotiating;

(3) Pricing of the contract, subcontract, or modification; or

(4) Performance of the contract, subcontract or modification.

(d) Comptroller General.-

(1) The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the Contractor's directly pertinent records involving transactions related to this contract or a subcontract hereunder and to interview any current employee regarding such transactions.

(2) This paragraph may not be construed to require the Contractor or subcontractor to create or maintain any record that the Contractor or subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) Reports. If the Contractor is required to furnish cost, funding, or performance reports, the Contracting Officer or an authorized representative of the Contracting Officer shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating-

(1) The effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports; and

(2) The data reported.
(f) Availability. The Contractor shall make available at its office at all reasonable times the records, materials, and other evidence described in paragraphs (a), (b), (c), (d), and (e) of this clause, for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in Subpart 4.7, Contractor Records Retention, of the Federal Acquisition Regulation (FAR), or for any longer period required by statute or by other clauses of this contract. In addition-

(1) If this contract is completely or partially terminated, the Contractor shall make available the records relating to the work terminated until 3 years after any resulting final termination settlement; and

(2) The Contractor shall make available records relating to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to this contract until such appeals, litigation, or claims are finally resolved.

(g) The Contractor shall insert a clause containing all the terms of this clause, including this paragraph (g), in all subcontracts under this contract that exceed the simplified acquisition threshold, and-

(1) That are cost-reimbursement, incentive, time-and-materials, labor-hour, or price-redeterminable type or any combination of these;

(2) For which certified cost or pricing data are required; or

(3) That require the subcontractor to furnish reports as discussed in paragraph (e) of this clause.

The clause may be altered only as necessary to identify properly the contracting parties and the Contracting Officer under the Government prime contract.

(End of clause)

1.28 RESERVED

1.29 *FAR 52.215-11 PRICE REDUCTION FOR DEFECTIVE CERTIFIED COST OR PRICING DATA-MODIFICATIONS (AUG 2011)

(a) This clause shall become operative only for any modification to this contract involving a pricing adjustment expected to exceed the threshold for submission of certified cost or pricing data at FAR 15.403-4, except that this clause does not apply to any modification if an exception under FAR 15.403-1 applies.

(b) If any price, including profit or fee, negotiated in connection with any modification under this clause, or any cost reimbursable under this contract, was increased by any significant amount because (1) the Contractor or a subcontractor furnished certified cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data, (2) a subcontractor or prospective subcontractor furnished the Contractor certified cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data, or (3) any of these parties furnished data of any description that were not accurate, the price or cost shall be reduced accordingly and the contract shall be modified to reflect the reduction. This right to a price reduction is limited to that resulting from defects in data relating to modifications for which this clause becomes operative under paragraph (a) of this clause.

(c) Any reduction in the contract price under paragraph (b) of this clause due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which (1) the actual subcontract
or (2) the actual cost to the Contractor, if there was no subcontract, was
less than the prospective subcontract cost estimate submitted by the
Contractor; provided, that the actual subcontract price was not itself
affected by defective certified cost or pricing data.

(d) (1) If the Contracting Officer determines under paragraph (b)
of this clause that a price or cost reduction should be made, the
Contractor agrees not to raise the following matters as a defense:

(i) The Contractor or subcontractor was a sole source
supplier or otherwise was in a superior bargaining position and thus the
price of the contract would not have been modified even if accurate,
complete, and current certified cost or pricing data had been submitted.

(ii) The Contracting Officer should have known that the
certified cost or pricing data in issue were defective even though the
Contractor or subcontractor took no affirmative action to bring the
character of the data to the attention of the Contracting Officer.

(iii) The contract was based on an agreement about the
total cost of the contract and there was no agreement about the cost of
each item procured under the contract.

(iv) The Contractor or subcontractor did not submit a
Certificate of Current Cost or Pricing Data.

(2)(i) Except as prohibited by paragraph (d)(2)(ii) of this
clause, an offset in an amount determined appropriate by the Contracting
Officer based upon the facts shall be allowed against the amount of a
contract price reduction if-

(A) The Contractor certifies to the Contracting
Officer that, to the best of the Contractor's knowledge and belief, the
Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the certified cost
or pricing data were available before the "as of" date specified on its
Certificate of Current Cost or Pricing Data, and that the data were not
submitted before such date.

(ii) An offset shall not be allowed if-

(A) The understated data were known by the
Contractor to be understated before the "as of" date specified on its
Certificate of Current Cost or Pricing Data; or

(B) The Government proves that the facts
demonstrate that the contract price would not have increased in the amount
to be offset even if the available data had been submitted before the "as
of" date specified on its Certificate of Current Cost or Pricing Data.

(e) If any reduction in the contract price under this clause reduces
the price of items for which payment was made prior to the date of the
modification reflecting the price reduction, the Contractor shall be liable
to and shall pay the United States at the time such overpayment is repaid-

(1) Interest compounded daily, as required by 26 U.S.C. 6622,
on the amount of such overpayment to be computed from the date(s) of
overpayment to the Contractor to the date the Government is repaid by the
Contractor at the applicable underpayment rate effective for each quarter
prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

(2) A penalty equal to the amount of the overpayment, if the
Contractor or subcontractor knowingly submitted certified cost or pricing
data that were incomplete, inaccurate, or noncurrent.

(End of clause)
1.31 *FAR 52.215-13 SUBCONTRACTOR CERTIFIED COST OR PRICING DATA-MODIFICATIONS (OCT 2010)

(a) The requirements of paragraphs (b) and (c) of this clause shall-
   (1) Become operative only for any modification to this contract involving a pricing adjustment expected to exceed the threshold for submission of certified cost or pricing data at FAR 15.403-4; and
   (2) Be limited to such modifications.

(b) Before awarding any subcontract expected to exceed the threshold for submission of certified cost or pricing data at FAR 15.403-4, on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving a pricing adjustment expected to exceed the threshold for submission of certified cost or pricing data at FAR 15.403-4, the Contractor shall require the subcontractor to submit certified cost or pricing data (actually or by specific identification in writing), in accordance with FAR 15.408, Table 15-2 (to include any information reasonably required to explain the subcontractor's estimating process such as the judgmental factors applied and the mathematical or other methods used in the estimate, including those used in projecting from known data, and the nature and amount of any contingencies included in the price), unless an exception under FAR 15.403-1 applies.

(c) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (b) of this clause were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that exceeds the threshold for submission of certified cost or pricing data at FAR 15.403-4 on the date of agreement on price or the date of award, whichever is later. (End of clause)

1.32 *FAR 52.215 15 PENSION ADJUSTMENTS AND ASSET REVERSIONS (OCT 2010)

(a) The Contractor shall promptly notify the Contracting Officer in writing when it determines that it will terminate a defined-benefit pension plan or otherwise recapture such pension fund assets.

(b) For segment closings, pension plan terminations, or curtailment of benefits, the amount of the adjustment shall be-
   (1) For contracts and subcontracts that are subject to full coverage under the Cost Accounting Standards (CAS) Board rules and regulations (48 CFR Chapter 99), the amount measured, assigned, and allocated in accordance with 48 CFR 9904.413-50(c)(12); and
   (2) For contracts and subcontracts that are not subject to full coverage under the CAS, the amount measured, assigned, and allocated in accordance with 48 CFR 9904.413-50(c)(12), except the numerator of the fraction at 48 CFR 904.413-50(c)(12)(vi) shall be the sum of the pension plan costs allocated to all non-CAS covered contracts and subcontracts that are subject to Federal Acquisition Regulation (FAR) Subpart 31.2 or for which cost or pricing data were submitted.

(c) For all other situations where assets revert to the Contractor,
or such assets are constructively received by it for any reason, the Contractor shall, at the Government's option, make a refund or give a credit to the Government for its equitable share of the gross amount withdrawn. The Government's equitable share shall reflect the Government's participation in pension costs through those contracts for which cost or pricing data were submitted or that are subject to FAR Subpart 31.2.

(d) The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(g).
(End of clause)

1.33 *FAR 52.215-17 WAIVER OF FACILITIES CAPITAL COST OF MONEY (OCT 1997)

The Contractor did not include facilities capital cost of money as a proposed cost of this contract. Therefore, it is an unallowable cost under this contract.
(End of clause)

1.34 *FAR 52.215-18 REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (JULY 2005)

(a) The Contractor shall promptly notify the Contracting Officer in writing when the Contractor determines that it will terminate or reduce the benefits of a PRB plan.
(b) If PRB fund assets revert or inure to the Contractor, or are constructively received by it under a plan termination or otherwise, the Contractor shall make a refund or give a credit to the Government for its equitable share as required by 31.205-6(o)(5) of the Federal Acquisition Regulation (FAR). When determining or agreeing on the method for recovery of the Government's equitable share, the contracting parties should consider the following methods: cost reduction, amortizing the credit over a number of years (with appropriate interest), cash refund, or some other agreed upon method. Should the parties be unable to agree on the method for recovery of the Government's equitable share, through good faith negotiations, the Contracting Officer shall designate the method of recovery.
(c) The Contractor shall insert the substance of this clause in all subcontracts that meet the applicability requirements of FAR 15.408(j).
(End of clause)

1.35 *FAR 52.215-19 NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

(a) The Contractor shall make the following notifications in writing:
   (1) When the Contractor becomes aware that a change in its ownership has occurred, or is certain to occur, that could result in changes in the valuation of its capitalized assets in the accounting records, the Contractor shall notify the Administrative Contracting Officer (ACO) within 30 days.
   (2) The Contractor shall also notify the ACO within 30 days whenever changes to asset valuations or any other cost changes have occurred or are certain to occur as a result of a change in ownership.
(b) The Contractor shall-
   (1) Maintain current, accurate, and complete inventory records
of assets and their costs;

(2) Provide the ACO or designated representative ready access to the records upon request;

(3) Ensure that all individual and grouped assets, their capitalized values, accumulated depreciation or amortization, and remaining useful lives are identified accurately before and after each of the Contractor's ownership changes; and

(4) Retain and continue to maintain depreciation and amortization schedules based on the asset records maintained before each Contractor ownership change.

(c) The Contractor shall include the substance of this clause in all subcontracts under this contract that meet the applicability requirement of FAR 15.408(k).

(End of clause)

1.36 *(FAR 52.215-21 REQUIREMENTS FOR CERTIFIED COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA-MODIFICATIONS (OCT 2010)

(a) Exceptions from certified cost or pricing data.

(1) In lieu of submitting certified cost or pricing data for modifications under this contract, for price adjustments expected to exceed the threshold set forth at FAR 15.403-4 on the date of the agreement on price or the date of the award, whichever is later, the Contractor may submit a written request for exception by submitting the information described in the following paragraphs. The Contracting Officer may require additional supporting information, but only to the extent necessary to determine whether an exception should be granted, and whether the price is fair and reasonable-

(i) Identification of the law or regulation establishing the price offered. If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.

(ii) Information on modifications of contracts or subcontracts for commercial items.

(A) If-

(1) The original contract or subcontract was granted an exception from certified cost or pricing data requirements because the price agreed upon was based on adequate price competition or prices set by law or regulation, or was a contract or subcontract for the acquisition of a commercial item; and

(2) The modification (to the contract or subcontract) is not exempted based on one of these exceptions, then the Contractor may provide information to establish that the modification would not change the contract or subcontract from a contract or subcontract for the acquisition of a commercial item to a contract or subcontract for the acquisition of an item other than a commercial item.

(B) For a commercial item exception, the Contractor shall provide, at a minimum, information on prices at which the same item or similar items have previously been sold that is adequate for evaluating the reasonableness of the price of the modification. Such information may include-

(1) For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog
price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities.

(2) For market-priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market.

(3) For items included on an active Federal Supply Service Multiple Award Schedule contract, proof that an exception has been granted for the schedule item.

(b) Requirements for certified cost or pricing data. If the Contractor is not granted an exception from the requirement to submit certified cost or pricing data, the following applies:

(1) The Contractor shall submit certified cost or pricing data, data other than certified cost or pricing data, and supporting attachments in accordance with Table 15-2 of FAR 15.408, which is incorporated by reference with the same force and effect as though it were inserted here in full text. The instructions in Table 15-2 are incorporated as a mandatory format to be used in this contract, unless the Contracting Officer and the Contractor agree to a different format and change this clause to use Alternate I.

(2) As soon as practicable after agreement on price, but before award (except for unpriced actions), the Contractor shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

(End of clause)

1.37 RESERVED

1.38 *FAR 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (OCT 2014)

(a) Definition. See 13 CFR 125.6(e) for definitions of terms used in paragraph (d).

(b) Evaluation preference. (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except-

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference; and

(ii) Otherwise successful offers from small business concerns.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) When the two highest rated offerors are a HUBZone small business concern and a large business, and the evaluated offer of the HUBZone small business concern is equal to the evaluated offer of the large business after considering the price evaluation preference, award will be made to the HUBZone small business concern.
(c) Waiver of evaluation preference. A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) and (e) of this clause do not apply if the offeror has waived the evaluation preference.

[ ] Offeror elects to waive the evaluation preference.

(d) Agreement. A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for-

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;

(3) General construction. (i) At least 15 percent of the cost of contract performance to be incurred for personnel will be spent on the prime contractor's employees;

(ii) At least 50 percent of the cost of the contract performance to be incurred for personnel will be spent on the prime contractor's employees or on a combination of the prime contractor's employees and employees of HUBZone small business concern subcontractors;

(iii) No more than 50 percent of the cost of contract performance to be incurred for personnel will be subcontracted to concerns that are not HUBZone small business concerns; or

(4) Construction by special trade contractors. (i) At least 25 percent of the cost of contract performance to be incurred for personnel will be spent on the prime contractor's employees;

(ii) At least 50 percent of the cost of the contract performance to be incurred for personnel will be spent on the prime contractor's employees or on a combination of the prime contractor's employees and employees of HUBZone small business concern subcontractors;

(iii) No more than 50 percent of the cost of contract performance to be incurred for personnel will be subcontracted to concerns that are not HUBZone small business concerns.

(e) A HUBZone joint venture agrees that the aggregate of the HUBZone small business concerns to the joint venture, not each concern separately, will perform the applicable percentage of work requirements.

(f)(1) When the total value of the contract exceeds $25,000, a HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business concern manufacturers.

(2) When the total value of the contract is equal to or less than $25,000, a HUBZone small business concern nonmanufacturer may provide end items manufactured by other than a HUBZone small business concern manufacturer provided the end items are produced or manufactured in the United States.

(3) Paragraphs (f)(1) and (f)(2) of this section do not apply in connection with construction or service contracts.

(g) Notice. The HUBZone small business offeror acknowledges that a prospective HUBZone awardee must be a HUBZone small business concern at the time of award of this contract. The HUBZone offeror shall provide the Contracting Officer a copy of the notice required by 13 CFR 126.501 if material changes occur before contract award that could affect its HUBZone eligibility. If the apparently successful HUBZone offeror is not a HUBZone small business concern at the time of award of this contract, the Contracting Officer will proceed to award to the next otherwise successful
HUBZone small business concern or other offeror.
(End of clause)

Alternate I (Jan 2011). As prescribed in 19.1309(b)(1), substitute the following paragraphs (d)(3) and (d)(4) for paragraphs (d)(3) and (d)(4) of the basic clause:

(3) General construction, at least 15 percent of the cost of the contract performance to be incurred for personnel will be spent on the concern's employees; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance to be incurred for personnel will be spent on the concern's employees.

1.39 *FAR 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (NOV 2016)

(a) Definitions. As used in this contract-

“HUBZone small business concern” means a small business concern, certified by the Small Business Administration, that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

“Service-disabled veteran-owned small business concern " -

(1) Means a small business concern-

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

“Small business concern" means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

“Small disadvantaged business concern", consistent with 13 CFR 124.1002, means a small business concern that represents, as part of its offer that-

(1)Is at least 51 percent unconditionally and directly owned (as defined at 13 CFR 124.105) by-

(i) One or more socially disadvantaged (as defined at 13 CFR 124.103) and economically disadvantaged (as defined at 13 CFR 124.104) individuals who are citizens of the United States; and

(ii) Each individual claiming economic disadvantage has a net worth not exceeding $750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(2) The management and daily business operations of which are controlled (as defined at 13.CFR 124.106) by individuals, who meet the criteria in paragraphs (1)(i) and (ii) of this definition.

“Veteran-owned small business concern" means a small business concern-

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.
"Women-owned small business concern" means a small business concern—
(1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and
(2) Whose management and daily business operations are controlled by one or more women.

(b) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(c) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

(d)(1) The Contractor may accept a subcontractor’s written representations of its size and socioeconomic status as a small business, small disadvantaged business, veteran-owned small business, service-disabled veteran-owned small business, or a women-owned small business if the subcontractor represents that the size and socioeconomic status representations with its offer are current, accurate, and complete as of the date of the offer for the subcontract.

(2) The Contractor may accept a subcontractor’s representations of its size and socioeconomic status as a small business, small disadvantaged business, veteran-owned small business, service-disabled veteran-owned small business, or a women-owned small business in the System for Award Management (SAM) if—
   (i) The subcontractor is registered in SAM; and
   (ii) The subcontractor represents that the size and socioeconomic status representations made in SAM are current, accurate and complete as of the date of the offer for the subcontract.

(3) The Contractor may not require the use of SAM for the purposes of representing size or socioeconomic status in connection with a subcontract.

(4) In accordance with 13 CFR 121.411, 124.1015, 125.29, 126.900, and 127.700, a contractor acting in good faith is not liable for misrepresentations made by its subcontractors regarding the subcontractor’s size or socioeconomic status.

(5) The Contractor shall confirm that a subcontractor representing itself as a HUBZone small business concern is certified by SBA as a HUBZone small business concern by accessing the System for Award Management.
Management database or by contacting the SBA. Options for contacting the SBA include—

   (i) HUBZone small business database search application web page at http://dsbs.sba.gov/dsbs/search/dsp_searchhubzone.cfm; or http://www.sba.gov/hubzone;

   (ii) In writing to the Director/HUB, U.S. Small Business Administration, 409 3rd Street, SW., Washington, DC 20416; or

   (iii) The SBA HUBZone Help Desk at hubzone@sba.gov.

(End of clause)

1.40 *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2017)

(a) This clause does not apply to small business concerns.

(b) Definitions. As used in this clause—

"Alaska Native Corporation (ANC)" means any Regional Corporation, Village Corporation, Urban Corporation, or Group Corporation organized under the laws of the State of Alaska in accordance with the Alaska Native Claims Settlement Act, as amended (43 U.S.C. 1601, et seq.) and which is considered a minority and economically disadvantaged concern under the criteria at 43 U.S.C. 1626(e)(1). This definition also includes ANC direct and indirect subsidiary corporations, joint ventures, and partnerships that meet the requirements of 43 U.S.C. 1626(e)(2).

"Commercial item" means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

"Commercial plan" means a subcontracting plan (including goals) that covers the offeror’s fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (e.g., division, plant, or product line).

"Electronic Subcontracting Reporting System (eSRS)" means the Governmentwide, electronic, web-based system for small business subcontracting program reporting. The eSRS is located at http://www.esrs.gov.

"Indian tribe" means any Indian tribe, band, group, pueblo, or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act (43 U.S.C.A. 1601 et seq.), that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs in accordance with 25 U.S.C. 1452(c). This definition also includes Indian-owned economic enterprises that meet the requirements of 25 U.S.C. 1452(e).

"Individual subcontracting plan" means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror’s planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.
"Master subcontracting plan" means a subcontracting plan that contains all the required elements of an individual subcontracting plan, except goals, and may be incorporated into individual subcontracting plans, provided the master subcontracting plan has been approved.

"Reduced payment" means a payment that is for less than the amount agreed upon in a subcontract in accordance with its terms and conditions, for supplies and services for which the Government has paid the prime contractor.

"Subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

"Total contract dollars" means the final anticipated dollar value, including the dollar value of all options.

"Untimely payment" means a payment to a subcontractor that is more than 90 days past due under the terms and conditions of a subcontract for supplies and services for which the Government has paid the prime contractor.

(c)(1) The Offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns. If the Offeror is submitting an individual subcontracting plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The subcontracting plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the Offeror ineligible for award of a contract.

(2)(i) The Contractor may accept a subcontractor’s written representations of its size and socioeconomic status as a small business, small disadvantaged business, veteran-owned small business, service-disabled veteran-owned small business, or a women-owned small business if the subcontractor represents that the size and socioeconomic status representations with its offer are current, accurate, and complete as of the date of the offer for the subcontract.

(ii) The Contractor may accept a subcontractor’s representations of its size and socioeconomic status as a small business, small disadvantaged business, veteran-owned small business, service-disabled veteran-owned small business, or a women-owned small business in the System for Award Management (SAM) if–

(A) The subcontractor is registered in SAM; and

(B) The subcontractor represents that the size and socioeconomic status representations made in SAM are current, accurate and complete as of the date of the offer for the subcontract.

(iii) The Contractor may not require the use of SAM for the purposes of
(iv) In accordance with 13 CFR 121.411, 124.1015, 125.29, 126.900, and 127.700, a contractor acting in good faith is not liable for misrepresentations made by its subcontractors regarding the subcontractor's size or socioeconomic status.

(d) The Offeror's subcontracting plan shall include the following:

(1) Separate goals, expressed in terms of total dollars subcontracted, and as a percentage of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. For individual subcontracting plans, and if required by the Contracting Officer, goals shall also be expressed in terms of percentage of total contract dollars, in addition to the goals expressed as a percentage of total subcontract dollars. The Offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs. In accordance with 43 U.S.C. 1626-

(i) Subcontracts awarded to an ANC or Indian tribe shall be counted towards the subcontracting goals for small business and small disadvantaged business concerns, regardless of the size or Small Business Administration certification status of the ANC or Indian tribe; and

(ii) Where one or more subcontractors are in the subcontract tier between the prime Contractor and the ANC or Indian tribe, the ANC or Indian tribe shall designate the appropriate Contractor(s) to count the subcontract towards its small business and small disadvantaged business subcontracting goals.

(A) In most cases, the appropriate Contractor is the Contractor that awarded the subcontract to the ANC or Indian tribe.

(B) If the ANC or Indian tribe designates more than one Contractor to count the subcontract toward its goals, the ANC or Indian tribe shall designate only a portion of the total subcontract award to each Contractor. The sum of the amounts designated to various Contractors cannot exceed the total value of the subcontract.

(C) The ANC or Indian tribe shall give a copy of the written designation to the Contracting Officer, the prime Contractor, and the subcontractors in between the prime Contractor and the ANC or Indian tribe within 30 days of the date of the subcontract award.

(D) If the Contracting Officer does not receive a copy of the ANC’s or the Indian tribe’s written designation within 30 days of the subcontract award, the Contractor that awarded the subcontract to the ANC or Indian tribe will be considered the designated Contractor.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual subcontracting plan; or the Offeror’s total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;
(ii) Total dollars planned to be subcontracted to small business concerns (including ANC and Indian tribes);

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns (including ANCs and Indian tribes); and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (e.g., existing company source lists, SAM, veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in SAM as an accurate representation of a concern’s size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of SAM as its source list does not relieve a firm of its responsibilities (e.g., outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the Offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

(i) Small business concerns (including ANC and Indian tribes);

(ii) Veteran-owned small business concerns;
(iii) Service-disabled veteran-owned small business concerns;
(iv) HUBZone small business concerns;
(v) Small disadvantaged business concerns (including ANC and Indian tribes); and
(vi) Women-owned small business concerns.

(7) The name of the individual employed by the Offeror who will administer the Offeror’s subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the Offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the Offeror will include the clause of this contract entitled “Utilization of Small Business Concerns” in all subcontracts that offer further subcontracting opportunities, and that the Offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of $700,000 ($1.5 million for construction of any public facility) with further subcontracting possibilities to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the Offeror will—

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the Offeror with the subcontracting plan;

(iii) After November 30, 2017, include subcontracting data for each order when reporting subcontracting achievements for indefinite-delivery, indefinite-quantity contracts intended for use by multiple agencies;

(iv) Submit the Individual Subcontract Report (ISR) and/or the Summary Subcontract Report (SSR), in accordance with paragraph (l) of this clause using the Electronic Subcontracting Reporting System (eSRS) at http://www.esrs.gov. The reports shall provide information on subcontract awards to small business concerns (including ANCs and Indian tribes that are not small businesses), veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns (including ANCs and Indian tribes that have not been certified by SBA as small disadvantaged businesses), women-owned small business concerns, and for NASA only, Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with this clause, or as provided in agency regulations;

(v) Ensure that its subcontractors with subcontracting plans agree to submit the ISR and/or the SSR using eSRS;

(vi) Provide its prime contract number, its DUNS number, and the e-mail address of the Offeror’s official responsible for acknowledging receipt of or rejecting the ISRs, to all first-tier subcontractors with subcontracting
(vii) Require that each subcontractor with a subcontracting plan provide the prime contract number, its own DUNS number, and the e-mail address of the subcontractor’s official responsible for acknowledging receipt of or rejecting the ISRs, to its subcontractors with subcontracting plans.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror’s efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (e.g., SAM), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than $150,000, indicating—

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not, why not;

(C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;

(D) Whether HUBZone small business concerns were solicited and, if not, why not;

(E) Whether small disadvantaged business concerns were solicited and, if not, why not;

(F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, service-disabled veteran-owned, and women-owned small
business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program’s requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(12) Assurances that the Offeror will make a good faith effort to acquire articles, equipment, supplies, services, or materials, or obtain the performance of construction work from the small business concerns that it used in preparing the bid or proposal, in the same or greater scope, amount, and quality used in preparing and submitting the bid or proposal. Responding to a request for a quote does not constitute use in preparing a bid or proposal. The Offeror used a small business concern in preparing the bid or proposal if—

(i) The Offeror identifies the small business concern as a subcontractor in the bid or proposal or associated small business subcontracting plan, to furnish certain supplies or perform a portion of the subcontract; or

(ii) The Offeror used the small business concern’s pricing or cost information or technical expertise in preparing the bid or proposal, where there is written evidence of an intent or understanding that the small business concern will be awarded a subcontract for the related work if the Offeror is awarded the contract.

(13) Assurances that the Contractor will provide the Contracting Officer with a written explanation if the Contractor fails to acquire articles, equipment, supplies, services or materials or obtain the performance of construction work as described in (d)(12) of this clause. This written explanation must be submitted to the Contracting Officer within 30 days of contract completion.

(14) Assurances that the Contractor will not prohibit a subcontractor from discussing with the Contracting Officer any material matter pertaining to payment to or utilization of a subcontractor.

(15) Assurances that the offeror will pay its small business subcontractors on time and in accordance with the terms and conditions of the underlying subcontract, and notify the contracting officer when the prime contractor makes either a reduced or an untimely payment to a small business subcontractor (see 52.242-5).

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled
veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor’s lists of potential small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all “make-or-buy” decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Confirm that a subcontractor representing itself as a HUBZone small business concern is certified by SBA as a HUBZone small business concern in accordance with 52.219-8(d)(2).

(5) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor’s subcontracting plan.

(6) For all competitive subcontracts over the simplified acquisition threshold in which a small business concern received a small business preference, upon determination of the successful subcontract offeror, prior to award of the subcontract the Contractor must inform each unsuccessful small business subcontract offeror in writing of the name and location of the apparent successful offeror and if the successful subcontract offeror is a small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concern.

(7) Assign each subcontract the NAICS code and corresponding size standard that best describes the principal purpose of the subcontract.

(f) A master subcontracting plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the Offeror by this clause; provided-

(1) The master subcontracting plan has been approved;

(2) The Offeror ensures that the master subcontracting plan is updated as necessary and provides copies of the approved master subcontracting plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master subcontracting plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.
(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror’s planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Once the Contractor’s commercial plan has been approved, the Government will not require another subcontracting plan from the same Contractor while the plan remains in effect, as long as the product or service being provided by the Contractor continues to meet the definition of a commercial item. A Contractor with a commercial plan shall comply with the reporting requirements stated in paragraph (d)(10) of this clause by submitting one SSR in eSRS for all contracts covered by its commercial plan. This report shall be acknowledged or rejected in eSRS by the Contracting Officer who approved the plan. This report shall be submitted within 30 days after the end of the Government’s fiscal year.

(h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.

(i) A contract may have no more than one subcontracting plan. When a contract modification exceeds the subcontracting plan threshold in 19.702(a), or an option is exercised, the goals of the existing subcontracting plan shall be amended to reflect any new subcontracting opportunities. When the goals in a subcontracting plan are amended, these goal changes do not apply retroactively.

(j) Subcontracting plans are not required from subcontractors when the prime contract contains the clause at 52.212-5, Contract Terms and Conditions Required to Implement Statutes or Executive Orders—Commercial Items, or when the subcontractor provides a commercial item subject to the clause at 52.244-6, Subcontracts for Commercial Items, under a prime contract.

(k) The failure of the Contractor or subcontractor to comply in good faith with (1) the clause of this contract entitled “Utilization Of Small Business Concerns,” or (2) an approved plan required by this clause, shall be a material breach of the contract and may be considered in any past performance evaluation of the Contractor.

(l) The Contractor shall submit ISRs and SSRs using the web-based eSRS at http://www.esrs.gov. Purchases from a corporation, company, or subdivision that is an affiliate of the Contractor or subcontractor are not included in these reports. Subcontract awards by affiliates shall be treated as subcontract awards by the Contractor. Subcontract award data reported by the Contractor and subcontractors shall be limited to awards made to their immediate next-tier subcontractors. Credit cannot be taken for awards made to lower tier subcontractors, unless the Contractor or subcontractor has been designated to receive a small business or small disadvantaged business credit from an ANC or Indian tribe. Only subcontracts involving performance in the United States or its outlying areas should be included in these reports with the exception of subcontracts under a contract awarded by the State Department or any other agency that has statutory or regulatory authority to require subcontracting plans for subcontracts performed outside the United States and its outlying areas.

(m) ISR. This report is not required for commercial plans. The report is required for each contract containing an individual subcontracting plan.
(i) The report shall be submitted semi-annually during contract performance for the periods ending March 31 and September 30. A report is also required for each contract within 30 days of contract completion. Reports are due 30 days after the close of each reporting period, unless otherwise directed by the Contracting Officer. Reports are required when due, regardless of whether there has been any subcontracting activity since the inception of the contract or the previous reporting period. When the Contracting Officer rejects an ISR, the Contractor shall submit a corrected report within 30 days of receiving the notice of ISR rejection.

(ii)(A) When a subcontracting plan contains separate goals for the basic contract and each option, as prescribed by FAR 19.704(c), the dollar goal inserted on this report shall be the sum of the base period through the current option; for example, for a report submitted after the second option is exercised, the dollar goal would be the sum of the goals for the basic contract, the first option, and the second option.

(B) If a subcontracting plan has been added to the contract pursuant to 19.702(a)(3) or 19.301-2(e), the Contractor’s achievements must be reported in the ISR on a cumulative basis from the date of incorporation of the subcontracting plan into the contract.

(iii) When a subcontracting plan includes indirect costs in the goals, these costs must be included in this report.

(iv) The authority to acknowledge receipt or reject the ISR resides—

(A) In the case of the prime Contractor, with the Contracting Officer; and

(B) In the case of a subcontract with a subcontracting plan, with the entity that awarded the subcontract.

(2) SSR.

(i) Reports submitted under individual contract plans.

(A) This report encompasses all subcontracting under prime contracts and subcontracts with an executive agency, regardless of the dollar value of the subcontracts. This report also includes indirect costs on a prorated basis when the indirect costs are excluded from the subcontracting goals.

(B) The report may be submitted on a corporate, company or subdivision (e.g. plant or division operating as a separate profit center) basis, unless otherwise directed by the agency.

(C) If the Contractor or a subcontractor is performing work for more than one executive agency, a separate report shall be submitted to each executive agency covering only that agency’s contracts, provided at least one of that agency’s contracts is over $700,000 (over $1.5 million for construction of a public facility) and contains a subcontracting plan. For DoD, a consolidated report shall be submitted for all contracts awarded by military departments/agencies and/or subcontracts awarded by DoD prime contractors.

(D) The report shall be submitted annually by October 30 for the twelve month period ending September 30. When a Contracting Officer rejects an SSR, the Contractor shall submit a revised report within 30 days of receiving the notice of SSR rejection.
(E) Subcontract awards that are related to work for more than one executive agency shall be appropriately allocated.

(F) The authority to acknowledge or reject SSRs in eSRS, including SSRs submitted by subcontractors with subcontracting plans, resides with the Government agency awarding the prime contracts unless stated otherwise in the contract.

(ii) Reports submitted under a commercial plan.

(A) The report shall include all subcontract awards under the commercial plan in effect during the Government's fiscal year and all indirect costs.

(B) The report shall be submitted annually, within thirty days after the end of the Government's fiscal year.

(C) If a Contractor has a commercial plan and is performing work for more than one executive agency, the Contractor shall specify the percentage of dollars attributable to each agency.

(D) The authority to acknowledge or reject SSRs for commercial plans resides with the Contracting Officer who approved the commercial plan.

(End of clause)

1.41 RESERVED

1.42 *FAR 52.219-16 LIQUIDATED DAMAGES-SUBCONTRACTING PLAN (JAN 1999)

(a) Failure to make a good faith effort to comply with the subcontracting plan, as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled "Small Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) Performance shall be measured by applying the percentage goals to the total actual subcontracting dollars or, if a commercial plan is involved, to the pro rata share of actual subcontracting dollars attributable to Government contracts covered by the commercial plan. If, at contract completion, or in the case of a commercial plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled "Small Business Subcontracting Plan," the Contractor shall pay the Government liquidated damages in an amount stated. The amount of probable damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made and to discuss the matter. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that
the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial plans, the Contracting Officer who approved the plan will perform the functions of the Contracting Officer under this clause on behalf of all agencies with contracts covered by a commercial plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled, Disputes, from many final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may have.

(End of clause)

1.43 RESERVED

1.44 RESERVED

1.45 *FAR 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)

If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice, including all relevant information, to the Contracting Officer.

(End of clause)

1.46 *FAR 52.222-3 CONVICT LABOR (JUNE 2003)

(a) Except as provided in paragraph (b) of this clause, the Contractor shall not employ in the performance of this contract any person undergoing a sentence of imprisonment imposed by any court of a State, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, or the U.S. Virgin Islands.

(b) The Contractor is not prohibited from employing persons-(1) On parole or probation to work at paid employment during the term of their sentence;

(2) Who have been pardoned or who have served their terms; or

(3) Confined for violation of the laws of any of the States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, or the U.S. Virgin Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if-(i) The worker is paid or is in an approved work training program on a voluntary basis;

(ii) Representatives of local union central bodies or similar labor union organizations have been consulted;

(iii) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services;
(iv) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and
(v) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.
(End of clause)

**1.47 *FAR 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT-OVERTIME COMPENSATION (MAY 2014)**

(a) Overtime requirements. No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) Violation; liability for unpaid wages; liquidated damages. The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of $10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards statute (found at 40 U.S.C. chapter 37).

(c) Withholding for unpaid wages and liquidated damages. The Contracting Officer will withhold from payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards statute.

(d) Payrolls and basic records. (1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number, labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Construction Wage Rate Requirements statute.

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or Department of Labor to interview employees in the workplace during working hours.

(e) Subcontracts. The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this clause in subcontracts that may require or involve the employment of laborers and mechanics and require subcontractors to include these provisions in any such lower tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.
(End of clause)
1.48 *FAR 52.222-5 CONSTRUCTION WAGE RATE REQUIREMENTS-SECONDARY SITE OF THE WORK (MAY 2014)

(a)(1) The offeror shall notify the Government if the offeror intends to perform work at any secondary site of the work, as defined in paragraph (a)(1)(ii) of the FAR clause at 52.222-6, Construction Wage Rate Requirements, of this solicitation.

(2) If the offeror is unsure if a planned work site satisfies the criteria for a secondary site of the work, the offeror shall request a determination from the Contracting Officer.

(b)(1) If the wage determination provided by the Government for work at the primary site of the work is not applicable to the secondary site of the work, the offeror shall request a wage determination from the Contracting Officer.

(2) The due date for receipt of offers will not be extended as a result of an offeror's request for a wage determination for a secondary site of the work.

(End of provision)

1.49 *FAR 52.222-6 CONSTRUCTION WAGE RATE REQUIREMENTS (MAY 2014)

(a) Definition.-"Site of the work"- (1) Means-

(i) The primary site of the work. The physical place or places where the construction called for in the contract will remain when work on it is completed; and

(ii) The secondary site of the work, if any. Any other site where a significant portion of the building or work is constructed, provided that such site is-

(A) Located in the United States; and

(B) Established specifically for the performance of the contract or project;

(2) Except as provided in paragraph (3) of this definition, includes any fabrication plants, mobile factories, batch plants, borrow pits, job headquarters, tool yards, etc., provided-

(i) They are dedicated exclusively, or nearly so, to performance of the contract or project; and

(ii) They are adjacent or virtually adjacent to the "primary site of the work" as defined in paragraph (a)(1)(i), or the "secondary site of the work" as defined in paragraph (a)(1)(ii) of this definition;

(3) Does not include permanent home offices, branch plant establishments, fabrication plants, or tool yards of a Contractor or subcontractor whose locations and continuance in operation are determined wholly without regard to a particular Federal contract or project. In addition, fabrication plants, batch plants, borrow pits, job headquarters, yards, etc., of a commercial or material supplier which are established by a supplier of materials for the project before opening of bids and not on the Project site, are not included in the "site of the work." Such permanent, previously established facilities are not a part of the "site of the work" even if the operations for a period of time may be dedicated exclusively or nearly so, to the performance of a contract.

(b)(1) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage
(2) Contributions made or costs reasonably anticipated for bona
fide fringe benefits under section 1(b)(2) of the Construction Wage Rate
Requirements statute on behalf of laborers or mechanics are considered
wages paid to such laborers or mechanics, subject to the provisions of
paragraph (e) of this clause; also, regular contributions made or costs
incurred for more than a weekly period (but not less often than quarterly)
under plans, funds, or programs which cover the particular weekly period,
are deemed to be constructively made or incurred during such period.

(3) Such laborers and mechanics shall be paid not less than the
appropriate wage rate and fringe benefits in the wage determination for the
classification of work actually performed, without regard to skill, except
as provided in the clause entitled Apprentices and Trainees. Laborers or
mechanics performing work in more than one classification may be
compensated at the rate specified for each classification for the time
actually worked therein; provided that the employer's payroll records
accurately set forth the time spent in each classification in which work is
performed.

(4) The wage determination (including any additional
classifications and wage rates conformed under paragraph (c) of this
clause) and the Construction Wage Rate Requirements (Davis-Bacon Act)
poster (WH-1321) shall be posted at all times by the Contractor and its
subcontractors at the primary site of the work and the secondary site of
the work, if any, in a prominent and accessible place where it can be
easily seen by the workers.

(c)(1) The Contracting Officer shall require that any class of
laborers or mechanics which is not listed in the wage determination and
which is to be employed under the contract shall be classified in
conformance with the wage determination. The Contracting Officer shall
approve an additional classification and wage rate and fringe benefits
therefor only when all the following criteria have been met:

(i) The work to be performed by the classification
requested is not performed by a classification in the wage determination.

(ii) The classification is utilized in the area by the
construction industry.

(iii) The proposed wage rate, including any bona fide
fringe benefits, bears a reasonable relationship to the wage rates
contained in the wage determination.

(2) If the Contractor and the laborers and mechanics to be
employed in the classification (if known), or their representatives, and
the Contracting Officer agree on the classification and wage rate
(including the amount designated for fringe benefits, where appropriate), a
report of the action taken shall be sent by the Contracting Officer to the
Administrator of the:

Wage and Hour Division
Employment Standards Administration
U.S. Department of Labor
The Administrator or an authorized representative will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.  

3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.  

4) The wage rate (including fringe benefits, where appropriate) determined pursuant to paragraphs (c)(2) and (c)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.  

(d) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.  

(e) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Construction Wage Rate Requirements statute have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.  

(End of clause)

1.50 *FAR 52.222-7 WITHHOLDING OF FUNDS (MAY 2014)

The Contracting Officer shall, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally assisted contract subject to prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.  

(End of clause)
Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of 3 years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 40 U.S.C. 3141(2)(B) (Construction Wage Rate Requirement statute)), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under paragraph (d) of the clause entitled Construction Wage Rate Requirements, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in 40 U.S.C. 3141(2)(B), the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause, except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be obtained from the U.S. Department of Labor Wage and Hour Division website at http://www.dol.gov/whd/forms/wh347.pdf. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Contracting Officer, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a Prime Contractor to require a subcontractor to provide addresses and social security numbers to the Prime Contractor for its own records, without weekly submission to the Contracting Officer.

Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify-

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR Part 3; and
(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (b)(2) of this clause.

(4) The falsification of any of the certifications in this clause may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(c) The Contractor or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by the Contracting Officer or authorized representatives of the Contracting Officer or the Department of Labor. The Contractor or subcontractor shall permit the Contracting Officer or representatives of the Contracting Officer or the Department of Labor to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit required records or to make them available, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(End of clause)

1.52 *FAR 52.222-9 APPRENTICES AND TRAINEES (JULY 2005)

(a) Apprentices. (1) An apprentice will be permitted to work at less than the predetermined rate for the work performed when employed-

(i) Pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer, and Labor Services (OATELS) or with a State Apprenticeship Agency recognized by the OATELS; or

(ii) In the first 90 days of probationary employment as an apprentice in such an apprenticeship program, even though not individually registered in the program, if certified by the OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program.

(3) Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph (a)(1) of this clause, shall be paid not less than the applicable wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress,
expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination.

(5) Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(6) In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees. (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer, and Labor Services (OATELS). The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by OATELS.

(2) Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the OATELS shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed.

(3) In the event OATELS withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

(End of clause)
Small Arms Range Complex - Buckley AFB, CO

1.54  *FAR 52.222-11  SUBCONTRACTS (LABOR STANDARDS) (MAY 2014)

(a) Definition. "Construction, alteration or repair," as used in this clause, means all types of work done by laborers and mechanics employed by the construction Contractor or construction subcontractor on a particular building or work at the site thereof, including without limitation-

(1) Altering, remodeling, installation (if appropriate) on the site of the work of items fabricated off-site;
(2) Painting and decorating;
(3) Manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the building or work;
(4) Transportation of materials and supplies between the site of the work within the meaning of paragraphs (a)(1)(i) and (ii) of the "site of the work" as defined in the FAR clause at 52.222-6, Construction Wage Rate Requirements of this contract, and a facility which is dedicated to the construction of the building or work and is deemed part of the site of the work within the meaning of paragraph (2) of the "site of the work" definition; and

(5) Transportation of portions of the building or work between a secondary site where a significant portion of the building or work is constructed, which is part of the "site of the work" definition in paragraph (a)(1)(ii) of the FAR clause at 52.222-6, Construction Wage Rate Requirements, and the physical place or places where the building or work will remain (paragraph (a)(1)(i) of the FAR clause at 52.222-6, in the "site of the work" definition).

(b) The Contractor shall insert in any subcontracts for construction, alterations and repairs within the United States the clauses entitled-

(1) Construction Wage Rate Requirements;
(2) Contract Work Hours and Safety Standards-Overtime Compensation (if the clause is included in this contract);
(3) Apprentices and Trainees;
(4) Payrolls and Basic Records;
(5) Compliance with Copeland Act Requirements;
(6) Withholding of Funds;
(7) Subcontracts (Labor Standards);
(8) Contract Termination-Debarment;
(9) Disputes Concerning Labor Standards;
(10) Compliance with Construction Wage Rate Requirements and Related Regulations; and

(11) Certification of Eligibility.

c) The prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor performing construction within the United States with all the contract clauses cited in paragraph (b).

d)(1) Within 14 days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Standard Form (SF) 1413, Statement and Acknowledgment, for each subcontract for construction within the United States, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (b) of this clause have been included in the subcontract.

(2) Within 14 days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

(e) The Contractor shall insert the substance of this clause, including this paragraph (e) in all subcontracts for construction within the United States.

(End of clause)
1.55 *FAR 52.222-12 CONTRACT TERMINATION--DEBARMENT (MAY 2014)

A breach of the contract clauses entitled Construction Wage Rate Requirements, Contract Work Hours and Safety Standards--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Subcontracts (Labor Standards), Compliance with Construction Wage Rate Requirements and Related Regulations, or Certification of Eligibility may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 CFR 5.12.

(End of Clause)

1.56 *FAR 52.222-13 COMPLIANCE WITH CONSTRUCTION WAGE RATE REQUIREMENTS AND RELATED REGULATIONS (MAY 2014)

All rulings and interpretations of the Construction Wage Rate Requirements and Related statutes contained in 29 CFR Parts 1, 3, and 5 are hereby incorporated by reference in this contract.

(End of clause)

1.57 *FAR 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency the U.S. Department of Labor, or the employees of their representatives.

(End of clause)

1.58 *FAR 52.222-15 CERTIFICATION OF ELIGIBILITY (MAY 2014)

(a) By entering into this contract, the Contractor certifies that neither it nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b)(2) or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b)(2) or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(End of clause)

1.59 *FAR 52.222-21 PROHIBITION OF SEGREGATED FACILITIES (APR 2015)

(a) Definitions. As used in this clause--
"Gender identity" has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.
"Segregated facilities," means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas

(End of clause)
provided to assure privacy between the sexes.

"Sexual orientation" has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

1.60 FAR 52.222-26 EQUAL OPPORTUNITY (SEPT 2016)

(a) Definition. As used in this clause--

"Compensation" means any payments made to, or on behalf of, an employee or offered to an applicant as remuneration for employment, including but not limited to salary, wages, overtime pay, shift differentials, bonuses, commissions, vacation and holiday pay, allowances, insurance and other benefits, stock options and awards, profit sharing, and retirement.

"Compensation information" means the amount and type of compensation provided to employees or offered to applicants, including, but not limited to, the desire of the Contractor to attract and retain a particular employee for the value the employee is perceived to add to the Contractor's profit or productivity; the availability of employees with like skills in the marketplace; market research about the worth of similar jobs in the relevant marketplace; job analysis, descriptions, and evaluations; salary and pay structures; salary surveys; labor union agreements; and Contractor decisions, statements and policies related to setting or altering employee compensation.

"Essential job functions" means the fundamental job duties of the employment position an individual holds. A job function may be considered essential if-

(1) The access to compensation information is necessary in order to perform that function or another routinely assigned business task; or

(2) The function or duties of the position include protecting and maintaining the privacy of employee personnel records, including compensation information.

"Gender identity" has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

"Sexual orientation" has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

"United States," means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b)(1) If, during any 12-month period (including the 12 months...
preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of $10,000, the Contractor shall comply with this clause, except for work performed outside the United States by employees who were not recruited within the United States. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(2) If the Contractor is a religious corporation, association, educational institution, or society, the requirements of this clause do not apply with respect to the employment of individuals of a particular religion to perform work connected with the carrying on of the Contractor's activities (41 CFR 60-1.5).

(c)(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. This shall include, but not be limited to-

(i) Employment;
(ii) Upgrading;
(iii) Demotion;
(iv) Transfer;
(v) Recruitment or recruitment advertising;
(vi) Layoff or termination;
(vii) Rates of pay or other forms of compensation; and
(viii) Selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(5)(i) The Contractor shall not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This prohibition against discrimination does not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee’s essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor’s legal duty to furnish information.

(ii) The Contractor shall disseminate the prohibition on discrimination in paragraph (c)(5)(i) of this clause, using language prescribed by the Director of the Office of Federal Contract Compliance Programs (OFCCP), to employees and applicants by-
(A) Incorporation into existing employee manuals or handbooks; and

(B) Electronic posting or by posting a copy of the provision in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(7) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(8) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR Part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(9) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(10) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(11) The Contractor shall include the terms and conditions of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(12) The Contractor shall take such action with respect to any subcontract or purchase order as the Director of OFCCP may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance, provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(d) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.

(End of clause)
1.61 FAR 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (APR 2015)

(a) Definitions.
"Covered area," means the geographical area described in the solicitation for this contract.
"Deputy Assistant Secretary," means the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee.
"Employer's identification number," means the Federal Social Security number used on the employer's quarterly Federal tax return, U.S. Treasury Department Form 941.
"Gender identity" has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.
"Minority," as used in this clause, means--
(1) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
(2) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);
(3) Black (all persons having origins in any of the black African racial groups not of Hispanic origin); and
(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).
"Sexual orientation" has the meaning given by the Department of Labor's Office of Federal Contract Compliance Programs, and is found at www.dol.gov/ofccp/LGBT/LGBT_FAQs.html.

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction trade each such subcontract in excess of $10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative action obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good-faith performance by other Contractors or subcontractors toward a goal in an approved plan does not excuse any Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each
(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and implement affirmative action steps at least as extensive as the following:

1. Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at these sites or facilities.

2. Establish and maintain a current list of sources for minority and female recruitment. Provide written notification to minority and female recruitment sources and community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

3. Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

4. Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

5. Develop on-the-job training opportunities and/or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under subparagraph (g)(2) of this clause.

6. Disseminate the Contractor's equal employment policy by--

   (i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;

   (ii) Including the policy in any policy manual and in collective bargaining agreements;
(iii) Publicizing the policy in the company newspaper, annual report, etc.;
(iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and
(v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.

(7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.

(9) Direct recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students, and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

(10) Encourage present minority and female employees to recruit minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

(11) Validate all tests and other selection requirements where required under 41 CFR 60-3.

(12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities. Encourage these employees to seek or to prepare for, through appropriate training, etc., opportunities for promotion.

(13) Ensure that seniority practices job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the Contractor's obligations under this contract are being carried out.

(14) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

(15) Maintain a record of solicitations for subcontracts for minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

(16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.

(h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its
obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--

(1) Actively participates in the group;
(2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;
(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;
(4) Makes a good-faith effort to meet its individual goals and timetables; and
(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women shall be established. The Contractor is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use goals or affirmative action standards to discriminate against any person because of race, color, religion, sex, sexual orientation, gender identity, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts under Executive Order 11246, as amended.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination, and cancellation of existing subcontracts, as may be imposed or ordered under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take action as prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;
(2) Submit reports as may be required by the Government; and
(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, separate records are not required to be maintained.

(o) Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

(End of clause)
1.62 *FAR 52.222-35  EQUAL OPPORTUNITY FOR VETERANS (OCT 2015)

(a) Definitions. As used in this clause—

“Active duty wartime or campaign badge veteran,” “Armed Forces service medal veteran,” “disabled veteran,” “protected veteran,” “qualified disabled veteran,” and “recently separated veteran” have the meanings given at FAR 22.1301.

(b) Equal opportunity clause. The Contractor shall abide by the requirements of the equal opportunity clause at 41 CFR 60-300.5(a), as of March 24, 2014. This clause prohibits discrimination against qualified protected veterans, and requires affirmative action by the Contractor to employ and advance in employment qualified protected veterans.

(c) Subcontracts. The Contractor shall insert the terms of this clause in subcontracts of $150,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as specified by the Director, Office of Federal Contract Compliance Programs, to enforce the terms, including action for noncompliance. Such necessary changes in language may be made as shall be appropriate to identify properly the parties and their undertakings.

(End of clause)

1.63 *FAR 52.222-36  EQUAL OPPORTUNITY FOR WORKERS WITH DISABILITIES (JUL 2014)

(a) Equal opportunity clause. The Contractor shall abide by the requirements of the equal opportunity clause at 41 CFR 60-741.5(a), as of March 24, 2014. This clause prohibits discrimination against qualified individuals on the basis of disability, and requires affirmative action by the Contractor to employ and advance in employment qualified individuals with disabilities.

(b) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of $15,000 unless exempted by rules, regulations, or orders of the Secretary, so that such provisions will be binding upon each subcontractor or vendor. The Contractor shall act as specified by the Director, Office of Federal Contract Compliance Programs of the U.S. Department of Labor, to enforce the terms, including action for noncompliance. Such necessary changes in language may be made as shall be appropriate to identify properly the parties and their undertakings.

(End of clause)

1.64 *FAR 52.222-37  EMPLOYMENT REPORTS ON VETERANS (FEB 2016)

(a) Definitions. As used in this clause, “active duty wartime or campaign badge veteran,” “Armed Forces service medal veteran,” “disabled veteran,” “protected veteran,” and “recently separated veteran,” have the meanings given in FAR 22.1301.

(b) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on—

(1) The total number of employees in the contractor’s workforce, by job
category and hiring location, who are protected veterans (i.e., active duty wartime or campaign badge veterans, Armed Forces service medal veterans, disabled veterans, and recently separated veterans);

(2) The total number of new employees hired during the period covered by the report, and of the total, the number of protected veterans (i.e., active duty wartime or campaign badge veterans, Armed Forces service medal veterans, disabled veterans, and recently separated veterans); and

(3) The maximum number and minimum number of employees of the Contractor or subcontractor at each hiring location during the period covered by the report.


(d) The Contractor shall submit VETS-4212 Reports no later than September 30 of each year.

(e) The employment activity report required by paragraphs (b)(2) and (b)(3) of this clause shall reflect total new hires, and maximum and minimum number of employees, during the most recent 12-month period preceding the ending date selected for the report. Contractors may select an ending date—

(1) As of the end of any pay period between July 1 and August 31 of the year the report is due; or

(2) As of December 31, if the Contractor has prior written approval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(f) The number of veterans reported must be based on data known to the contractor when completing the VETS-4212. The contractor’s knowledge of veterans status may be obtained in a variety of ways, including an invitation to applicants to self-identify (in accordance with 41 CFR 60-300.42), voluntary self-disclosure by employees, or actual knowledge of veteran status by the contractor. This paragraph does not relieve an employer of liability for discrimination under 38 U.S.C. 4212.

(g) The Contractor shall insert the terms of this clause in subcontracts of $150,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor.

(End of clause)

1.65 *FAR 52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (SEP 2010)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (i.e., if it has any contract containing Federal Acquisition Regulation clause 52.222-37, Employment Reports on Veterans), it has submitted the most recent VETS-100 Report required by that clause.

(End of provision)
1.66 FAR 52.222-40 NOTIFICATION OF EMPLOYEE RIGHTS UNDER THE NATIONAL LABOR RELATIONS ACT (DEC 2010)

(a) During the term of this contract, the Contractor shall post an employee notice, of such size and in such form, and containing such content as prescribed by the Secretary of Labor, in conspicuous places in and about its plants and offices where employees covered by the National Labor Relations Act engage in activities relating to the performance of the contract, including all places where notices to employees are customarily posted both physically and electronically, in the languages employees speak, in accordance with 29 CFR 471.2 (d) and (f).

(1) Physical posting of the employee notice shall be in conspicuous places in and about the Contractor's plants and offices so that the notice is prominent and readily seen by employees who are covered by the National Labor Relations Act and engage in activities related to the performance of the contract.

(2) If the Contractor customarily posts notices to employees electronically, then the Contractor shall also post the required notice electronically by displaying prominently, on any website that is maintained by the Contractor and is customarily used for notices to employees about terms and conditions of employment, a link to the Department of Labor's website that contains the full text of the poster. The link to the Department's website, as referenced in (b)(3) of this section, must read, "Important Notice about Employee Rights to Organize and Bargain Collectively with Their Employers."

(b) This required employee notice, printed by the Department of Labor, may be-

(1) Obtained from the Division of Interpretations and Standards, Office of Labor-Management Standards, U.S. Department of Labor, 200 Constitution Avenue, NW., Room N-5609, Washington, DC 20210, (202) 693-0123, or from any field office of the Office of Labor-Management Standards or Office of Federal Contract Compliance Programs;

(2) Provided by the Federal contracting agency if requested;

(3) Downloaded from the Office of Labor-Management Standards Web site at www.dol.gov/olms/regs/compliance/EO13496.htm; or

(4) Reproduced and used as exact duplicate copies of the Department of Labor's official poster.

(c) The required text of the employee notice referred to in this clause is located at Appendix A, Subpart A, 29 CFR Part 471.

(d) The Contractor shall comply with all provisions of the employee notice and related rules, regulations, and orders of the Secretary of Labor.

(e) In the event that the Contractor does not comply with the requirements set forth in paragraphs (a) through (d) of this clause, this contract may be terminated or suspended in whole or in part, and the Contractor may be suspended or debarred in accordance with 29 CFR 471.14 and subpart 9.4. Such other sanctions or remedies may be imposed as are provided by 29 CFR part 471, which implements Executive Order 13496 or as otherwise provided by law.

(f) Subcontracts.

(1) The Contractor shall include the substance of this clause, including this paragraph (f), in every subcontract that exceeds $10,000 and will be performed wholly or partially in the United States, unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to section 3 of Executive Order 13496 of January 30, 2009, so that such provisions will be binding upon each subcontractor.

(2) The Contractor shall not procure supplies or services in a way designed to avoid the applicability of Executive Order 13496 or this clause.
(3) The Contractor shall take such action with respect to any such subcontract as may be directed by the Secretary of Labor as a means of enforcing such provisions, including the imposition of sanctions for noncompliance.

(4) However, if the Contractor becomes involved in litigation with a subcontractor, or is threatened with such involvement, as a result of such direction, the Contractor may request the United States, through the Secretary of Labor, to enter into such litigation to protect the interests of the United States.
(End of clause)

1.67  *FAR 52.222-50   COMBATING TRAFFICKING IN PERSONS (MAR 2015)

(a) Definitions. As used in this clause—

"Agent" means any individual, including a director, an officer, an employee, or an independent contractor, authorized to act on behalf of the organization.

"Coercion" means—

(1) Threats of serious harm to or physical restraint against any person;

(2) Any scheme, plan, or pattern intended to cause a person to believe that failure to perform an act would result in serious harm to or physical restraint against any person; or

(3) The abuse or threatened abuse of the legal process.

"Commercially available off-the-shelf (COTS) item" means—

(1) Any item of supply (including construction material) that is—

(i) A commercial item (as defined in paragraph (1) of the definition at FAR 2.101);

(ii) Sold in substantial quantities in the commercial marketplace; and

(iii) Offered to the Government, under a contract or subcontract at any tier, without modification, in the same form in which it is sold in the commercial marketplace; and

(2) Does not include bulk cargo, as defined in 46 U.S.C. 40102(4), such as agricultural products and petroleum products.

"Commercial sex act" means any sex act on account of which anything of value is given to or received by any person.

"Debt bondage" means the status or condition of a debtor arising from a pledge by the debtor of his or her personal services or of those of a person under his or her control as a security for debt, if the value of those services as reasonably assessed is not applied toward the liquidation of the debt or the length and nature of those services are not respectively limited and defined.

"Employee" means an employee of the Contractor directly engaged in
the performance of work under the contract who has other than a minimal impact or involvement in contract performance.

"Forced Labor" means knowingly providing or obtaining the labor or services of a person—

(1) By threats of serious harm to, or physical restraint against, that person or another person;

(2) By means of any scheme, plan, or pattern intended to cause the person to believe that, if the person did not perform such labor or services, that person or another person would suffer serious harm or physical restraint; or

(3) By means of the abuse or threatened abuse of law or the legal process.

"Involuntary servitude" includes a condition of servitude induced by means of—

(1) Any scheme, plan, or pattern intended to cause a person to believe that, if the person did not enter into or continue in such conditions, that person or another person would suffer serious harm or physical restraint; or

(2) The abuse or threatened abuse of the legal process.

"Severe forms of trafficking in persons" means—

(1) Sex trafficking in which a commercial sex act is induced by force, fraud, or coercion, or in which the person induced to perform such act has not attained 18 years of age; or

(2) The recruitment, harboring, transportation, provision, or obtaining of a person for labor or services, through the use of force, fraud, or coercion for the purpose of subjection to involuntary servitude, peonage, debt bondage, or slavery.

"Sex trafficking" means the recruitment, harboring, transportation, provision, or obtaining of a person for the purpose of a commercial sex act.

"Subcontract" means any contract entered into by a subcontractor to furnish supplies or services for performance of a prime contract or a subcontract.

"Subcontractor" means any supplier, distributor, vendor, or firm that furnishes supplies or services to or for a prime contractor or another subcontractor.

"United States" means the 50 States, the District of Columbia, and outlying areas.

(b) Policy. The United States Government has adopted a policy prohibiting trafficking in persons including the trafficking-related activities of this clause. Contractors, contractor employees, and their agents shall not—

(1) Engage in severe forms of trafficking in persons during the period of performance of the contract;
(2) Procure commercial sex acts during the period of performance of the contract;

(3) Use forced labor in the performance of the contract;

(4) Destroy, conceal, confiscate, or otherwise deny access by an employee to the employee’s identity or immigration documents, such as passports or drivers' licenses, regardless of issuing authority;

(5)(i) Use misleading or fraudulent practices during the recruitment of employees or offering of employment, such as failing to disclose, in a format and language accessible to the worker, basic information or making material misrepresentations during the recruitment of employees regarding the key terms and conditions of employment, including wages and fringe benefits, the location of work, the living conditions, housing and associated costs (if employer or agent provided or arranged), any significant cost to be charged to the employee, and, if applicable, the hazardous nature of the work;

(ii) Use recruiters that do not comply with local labor laws of the country in which the recruiting takes place;

(6) Charge employees recruitment fees;

(7)(i) Fail to provide return transportation or pay for the cost of return transportation upon the end of employment—

(A) For an employee who is not a national of the country in which the work is taking place and who was brought into that country for the purpose of working on a U.S. Government contract or subcontract (for portions of contracts performed outside the United States); or

(B) For an employee who is not a United States national and who was brought into the United States for the purpose of working on a U.S. Government contract or subcontract, if the payment of such costs is required under existing temporary worker programs or pursuant to a written agreement with the employee (for portions of contracts performed inside the United States); except that—

(ii) The requirements of paragraphs (b)(7)(i) of this clause shall not apply to an employee who is—

(A) Legally permitted to remain in the country of employment and who chooses to do so; or

(B) Exempted by an authorized official of the contracting agency from the requirement to provide return transportation or pay for the cost of return transportation;

(iii) The requirements of paragraph (b)(7)(i) of this clause are modified for a victim of trafficking in persons who is seeking victim services or legal redress in the country of employment, or for a witness in an enforcement action related to trafficking in persons. The contractor shall provide the return transportation or pay the cost of return transportation in a way that does not obstruct the victim services, legal redress, or witness activity. For example, the contractor shall not only offer return transportation to a witness at a time when the witness is
still needed to testify. This paragraph does not apply when the exemptions at paragraph (b)(7)(ii) of this clause apply.

(8) Provide or arrange housing that fails to meet the host country housing and safety standards; or

(9) If required by law or contract, fail to provide an employment contract, recruitment agreement, or other required work document in writing. Such written work document shall be in a language the employee understands. If the employee must relocate to perform the work, the work document shall be provided to the employee at least five days prior to the employee relocating. The employee’s work document shall include, but is not limited to, details about work description, wages, prohibition on charging recruitment fees, work location(s), living accommodations and associated costs, time off, roundtrip transportation arrangements, grievance process, and the content of applicable laws and regulations that prohibit trafficking in persons.

(c) Contractor requirements. The Contractor shall—

(1) Notify its employees and agents of—

(i) The United States Government's policy prohibiting trafficking in persons, described in paragraph (b) of this clause; and

(ii) The actions that will be taken against employees or agents for violations of this policy. Such actions for employees may include, but are not limited to, removal from the contract, reduction in benefits, or termination of employment; and

(2) Take appropriate action, up to and including termination, against employees, agents, or subcontractors that violate the policy in paragraph (b) of this clause.

(d) Notification.

(1) The Contractor shall inform the Contracting Officer and the agency Inspector General immediately of—

(i) Any credible information it receives from any source (including host country law enforcement) that alleges a Contractor employee, subcontractor, subcontractor employee, or their agent has engaged in conduct that violates the policy in paragraph (b) of this clause (see also 18 U.S.C. 1351, Fraud in Foreign Labor Contracting, and 52.203-13(b)(3)(i)(A), if that clause is included in the solicitation or contract, which requires disclosure to the agency Office of the Inspector General when the Contractor has credible evidence of fraud); and

(ii) Any actions taken against a Contractor employee, subcontractor, subcontractor employee, or their agent pursuant to this clause.

(2) If the allegation may be associated with more than one contract, the Contractor shall inform the contracting officer for the contract with the highest dollar value.

(e) Remedies. In addition to other remedies available to the Government, the Contractor’s failure to comply with the requirements of paragraphs (c), (d), (g), (h), or (i) of this clause may result in—
(1) Requiring the Contractor to remove a Contractor employee or employees from the performance of the contract;

(2) Requiring the Contractor to terminate a subcontract;

(3) Suspension of contract payments until the Contractor has taken appropriate remedial action;

(4) Loss of award fee, consistent with the award fee plan, for the performance period in which the Government determined Contractor non-compliance;

(5) Declining to exercise available options under the contract;

(6) Termination of the contract for default or cause, in accordance with the termination clause of this contract; or

(7) Suspension or debarment.

(f) Mitigating and aggravating factors. When determining remedies, the Contracting Officer may consider the following:

(1) Mitigating factors. The Contractor had a Trafficking in Persons compliance plan or an awareness program at the time of the violation, was in compliance with the plan, and has taken appropriate remedial actions for the violation, that may include reparation to victims for such violations.

(2) Aggravating factors. The Contractor failed to abate an alleged violation or enforce the requirements of a compliance plan, when directed by the Contracting Officer to do so.

(g) Full cooperation.

(1) The Contractor shall, at a minimum—

(i) Disclose to the agency Inspector General information sufficient to identify the nature and extent of an offense and the individuals responsible for the conduct;

(ii) Provide timely and complete responses to Government auditors' and investigators' requests for documents;

(iii) Cooperate fully in providing reasonable access to its facilities and staff (both inside and outside the U.S.) to allow contracting agencies and other responsible Federal agencies to conduct audits, investigations, or other actions to ascertain compliance with the Trafficking Victims Protection Act of 2000 (22 U.S.C. chapter 78), E.O. 13627, or any other applicable law or regulation establishing restrictions on trafficking in persons, the procurement of commercial sex acts, or the use of forced labor; and

(iv) Protect all employees suspected of being victims of or witnesses to prohibited activities, prior to returning to the country from which the employee was recruited, and shall not prevent or hinder the ability of these employees from cooperating fully with Government authorities.
(2) The requirement for full cooperation does not foreclose any Contractor rights arising in law, the FAR, or the terms of the contract. It does not—

(i) Require the Contractor to waive its attorney-client privilege or the protections afforded by the attorney work product doctrine;

(ii) Require any officer, director, owner, employee, or agent of the Contractor, including a sole proprietor, to waive his or her attorney client privilege or Fifth Amendment rights; or

(iii) Restrict the Contractor from—

(A) Conducting an internal investigation; or

(B) Defending a proceeding or dispute arising under the contract or related to a potential or disclosed violation.

(h) Compliance plan.

(1) This paragraph (h) applies to any portion of the contract that—

(i) Is for supplies, other than commercially available off-the-shelf items, acquired outside the United States, or services to be performed outside the United States; and

(ii) Has an estimated value that exceeds $500,000.

(2) The Contractor shall maintain a compliance plan during the performance of the contract that is appropriate—

(i) To the size and complexity of the contract; and

(ii) To the nature and scope of the activities to be performed for the Government, including the number of non-United States citizens expected to be employed and the risk that the contract or subcontract will involve services or supplies susceptible to trafficking in persons.

(3) Minimum requirements. The compliance plan must include, at a minimum, the following:

(i) An awareness program to inform contractor employees about the Government’s policy prohibiting trafficking-related activities described in paragraph (b) of this clause, the activities prohibited, and the actions that will be taken against the employee for violations. Additional information about Trafficking in Persons and examples of awareness programs can be found at the website for the Department of State’s Office to Monitor and Combat Trafficking in Persons at http://www.state.gov/j/tip/.

(ii) A process for employees to report, without fear of retaliation, activity inconsistent with the policy prohibiting trafficking in persons, including a means to make available to all employees the hotline phone number of the Global Human Trafficking Hotline at 1-844-888-FREE and its email address at help@befree.org.

(iii) A recruitment and wage plan that only permits the
use of recruitment companies with trained employees, prohibits charging recruitment fees to the employee, and ensures that wages meet applicable host-country legal requirements or explains any variance.

(iv) A housing plan, if the Contractor or subcontractor intends to provide or arrange housing, that ensures that the housing meets host-country housing and safety standards.

(v) Procedures to prevent agents and subcontractors at any tier and at any dollar value from engaging in trafficking in persons (including activities in paragraph (b) of this clause) and to monitor, detect, and terminate any agents, subcontracts, or subcontractor employees that have engaged in such activities.

(4) Posting.

(i) The Contractor shall post the relevant contents of the compliance plan, no later than the initiation of contract performance, at the workplace (unless the work is to be performed in the field or not in a fixed location) and on the Contractor's Web site (if one is maintained). If posting at the workplace or on the Web site is impracticable, the Contractor shall provide the relevant contents of the compliance plan to each worker in writing.

(ii) The Contractor shall provide the compliance plan to the Contracting Officer upon request.

(5) Certification. Annually after receiving an award, the Contractor shall submit a certification to the Contracting Officer that—

(i) It has implemented a compliance plan to prevent any prohibited activities identified at paragraph (b) of this clause and to monitor, detect, and terminate any agent, subcontract or subcontractor employee engaging in prohibited activities; and

(ii) After having conducted due diligence, either—

(A) To the best of the Contractor's knowledge and belief, neither it nor any of its agents, subcontractors, or their agents is engaged in any such activities; or

(B) If abuses relating to any of the prohibited activities identified in paragraph (b) of this clause have been found, the Contractor or subcontractor has taken the appropriate remedial and referral actions.

(i) Subcontracts.

(1) The Contractor shall include the substance of this clause, including this paragraph (i), in all subcontracts and in all contracts with agents. The requirements in paragraph (h) of this clause apply only to any portion of the subcontract that—

(A) Is for supplies, other than commercially available off-the-shelf items, acquired outside the United States, or services to be performed outside the United States; and

(B) Has an estimated value that exceeds $500,000.
(2) If any subcontractor is required by this clause to submit a certification, the Contractor shall require submission prior to the award of the subcontract and annually thereafter. The certification shall cover the items in paragraph (h)(5) of this clause.

(End of clause)

1.68 *FAR 52.222-54 EMPLOYMENT ELIGIBILITY VERIFICATION (OCT 2015)

(a) Definitions. As used in this clause-

"Commercially available off-the-shelf (COTS) item"-

(1) Means any item of supply that is-

(i) A commercial item (as defined in paragraph (1) of the definition at 2.101);

(ii) Sold in substantial quantities in the commercial marketplace; and

(iii) Offered to the Government, without modification, in the same form in which it is sold in the commercial marketplace; and

(2) Does not include bulk cargo, as defined in 46 U.S.C. 40102(4), such as agricultural products and petroleum products. Per 46 CFR 525.1 (c)(2), "bulk cargo" means cargo that is loaded and carried in bulk onboard ship without mark or count, in a loose unpackaged form, having homogenous characteristics. Bulk cargo loaded into intermodal equipment, except LASH or Seabee barges, is subject to mark and count and, therefore, ceases to be bulk cargo.

"Employee assigned to the contract" means an employee who was hired after November 6, 1986 (after November 27, 2009 in the Commonwealth of the Northern Mariana Islands), who is directly performing work, in the United States, under a contract that is required to include the clause prescribed at 22.1803. An employee is not considered to be directly performing work under a contract if the employee-

(1) Normally performs support work, such as indirect or overhead functions; and

(2) Does not perform any substantial duties applicable to the contract.

"Subcontract" means any contract, as defined in 2.101, entered into by a subcontractor to furnish supplies or services for performance of a prime contract or a subcontract. It includes but is not limited to purchase orders, and changes and modifications to purchase orders.

"Subcontractor" means any supplier, distributor, vendor, or firm that furnishes supplies or services to or for a prime Contractor or another subcontractor.

"United States", as defined in 8 U.S.C. 1101(a)(38), means the 50 States, the District of Columbia, Puerto Rico, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands.

(b) Enrollment and verification requirements. (1) If the Contractor is not enrolled as a Federal Contractor in E-Verify at time of contract award, the Contractor shall-

(i) Enroll. Enroll as a Federal Contractor in the E-Verify program within 30 calendar days of contract award;

(ii) Verify all new employees. Within 90 calendar days of
enrollment in the E-Verify program, begin to use E-Verify to initiate verification of employment eligibility of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); and

(iii) Verify employees assigned to the contract. For each employee assigned to the contract, initiate verification within 90 calendar days after date of enrollment or within 30 calendar days of the employee's assignment to the contract, whichever date is later (but see paragraph (b)(4) of this section).

(2) If the Contractor is enrolled as a Federal Contractor in E-Verify at time of contract award, the Contractor shall use E-Verify to initiate verification of employment eligibility of-

(i) All new employees. (A) Enrolled 90 calendar days or more. The Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); or

(B) Enrolled less than 90 calendar days. Within 90 calendar days after enrollment as a Federal Contractor in E-Verify, the Contractor shall initiate verification of all new hires of the Contractor, who are working in the United States, whether or not assigned to the contract, within 3 business days after the date of hire (but see paragraph (b)(3) of this section); or

(ii) Employees assigned to the contract. For each employee assigned to the contract, the Contractor shall initiate verification within 90 calendar days after date of contract award or within 30 days after assignment to the contract, whichever date is later (but see paragraph (b)(4) of this section).

(3) If the Contractor is an institution of higher education (as defined at 20 U.S.C. 1001(a)); a State or local government or the government of a Federally recognized Indian tribe; or a surety performing under a takeover agreement entered into with a Federal agency pursuant to a performance bond, the Contractor may choose to verify only employees assigned to the contract, whether existing employees or new hires. The Contractor shall follow the applicable verification requirements at (b)(1) or (b)(2) respectively, except that any requirement for verification of new employees applies only to new employees assigned to the contract.

(4) Option to verify employment eligibility of all employees. The Contractor may elect to verify all existing employees hired after November 6, 1986 (after November 27, 2009, in the Commonwealth of the Northern Mariana Islands), rather than just those employees assigned to the contract. The Contractor shall initiate verification for each existing employee working in the United States who was hired after November 6, 1986 (after November 27, 2009, in the Commonwealth of the Northern Mariana Islands), within 180 calendar days of-

(i) Enrollment in the E-Verify program; or

(ii) Notification to E-Verify Operations of the Contractor's decision to exercise this option, using the contact information provided in the E-Verify program Memorandum of Understanding (MOU).

(5) The Contractor shall comply, for the period of performance of this contract, with the requirements of the E-Verify program MOU.

(i) The Department of Homeland Security (DHS) or the Social Security Administration (SSA) may terminate the Contractor's MOU and deny access to the E-Verify system in accordance with the terms of the MOU. In such case, the Contractor will be referred to a suspension or debarment official.

(ii) During the period between termination of the MOU and
a decision by the suspension or debarment official whether to suspend or debar, the Contractor is excused from its obligations under paragraph (b) of this clause. If the suspension or debarment official determines not to suspend or debar the Contractor, then the Contractor must reenroll in E-Verify.

(c) **Web site.** Information on registration for and use of the E-Verify program can be obtained via the Internet at the Department of Homeland Security Web site: http://www.dhs.gov/E-Verify.

(d) **Individuals previously verified.** The Contractor is not required by this clause to perform additional employment verification using E-Verify for any employee-

(1) Whose employment eligibility was previously verified by the Contractor through the E-Verify program;

(2) Who has been granted and holds an active U.S. Government security clearance for access to confidential, secret, or top secret information in accordance with the National Industrial Security Program Operating Manual; or

(3) Who has undergone a completed background investigation and been issued credentials pursuant to Homeland Security Presidential Directive (HSPD)-12, Policy for a Common Identification Standard for Federal Employees and Contractors.

(e) **Subcontracts.** The Contractor shall include the requirements of this clause, including this paragraph (e) (appropriately modified for identification of the parties), in each subcontract that-

(1) Is for—

(i) Commercial or noncommercial services (except for commercial services that are part of the purchase of a COTS item (or an item that would be a COTS item, but for minor modifications), performed by the COTS provider, and are normally provided for that COTS item); or

(ii) Construction;

(2) Has a value of more than $3,500; and

(3) Includes work performed in the United States.

(End of clause)

1.69 52.222-55 MINIMUM WAGES UNDER EXECUTIVE ORDER 13658 (DEC 2015)

(a) **Definitions.** As used in this clause—

"United States" means the 50 states and the District of Columbia.

"Worker"—

(1) Means any person engaged in performing work on, or in connection with, a contract covered by Executive Order 13658, and --

(i) Whose wages under such contract are governed by the Fair Labor Standards Act (29 U.S.C. chapter 8), the Service Contract Labor Standards statute (41 U.S.C. chapter 67), or the Wage Rate Requirements (Construction) statute (40 U.S.C. chapter 31, subchapter IV);

(ii) Other than individuals employed in a bona fide executive, administrative, or professional capacity, as those terms are defined in 29 CFR part 541; and

(iii) Regardless of the contractual relationship alleged to exist between the individual and the employer.

(2) Includes workers performing on, or in connection with, the contract whose wages are calculated pursuant to special certificates issued
under 29 U.S.C. 214(c).

(3) Also includes any person working on, or in connection with, the contract and individually registered in a bona fide apprenticeship or training program registered with the Department of Labor’s Employment and Training Administration, Office of Apprenticeship, or with a State Apprenticeship Agency recognized by the Office of Apprenticeship.

(b) Executive Order Minimum wage rate.

(1) The Contractor shall pay to workers, while performing in the United States, and performing on, or in connection with, this contract, a minimum hourly wage rate of $10.10 per hour beginning January 1, 2015.

(2) The Contractor shall adjust the minimum wage paid, if necessary, beginning January 1, 2016, and annually thereafter, to meet the applicable annual E.O. minimum wage. The Administrator of the Department of Labor’s Wage and Hour Division (the Administrator) will publish annual determinations in the Federal Register no later than 90 days before the effective date of the new E.O. minimum wage rate. The Administrator will also publish the applicable E.O. minimum wage on www.wdol.gov (or any successor website), and a general notice on all wage determinations issued under the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute, that will provide information on the E.O. minimum wage and how to obtain annual updates. The applicable published E.O. minimum wage is incorporated by reference into this contract.

(3)(i) The Contractor may request a price adjustment only after the effective date of the new annual E.O. minimum wage determination. Prices will be adjusted only for increased labor costs (including subcontractor labor costs) as a result of an increase in the annual E.O. minimum wage, and for associated labor costs (including those for subcontractors). Associated labor costs shall include increases or decreases that result from changes in social security and unemployment taxes and workers’ compensation insurance, but will not otherwise include any amount for general and administrative costs, overhead, or profit.

(ii) Subcontractors may be entitled to adjustments due to the new minimum wage, pursuant to paragraph (b)(2). Contractors shall consider any subcontractor requests for such price adjustment.

(iii) The Contracting Officer will not adjust the contract price under this clause for any costs other than those identified in paragraph (b)(3)(i) of this clause, and will not provide duplicate price adjustments with any price adjustment under clauses implementing the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute.

(4) The Contractor warrants that the prices in this contract do not include allowance for any contingency to cover increased costs for which adjustment is provided under this clause.

(5) A pay period under this clause may not be longer than semi-monthly, but may be shorter to comply with any applicable law or other requirement under this contract establishing a shorter pay period. Workers shall be paid no later than one pay period following the end of the regular pay period in which such wages were earned or accrued.

(6) The Contractor shall pay, unconditionally to each worker,
all wages due free and clear without subsequent rebate or kickback. The Contractor may make deductions that reduce a worker’s wages below the E.O. minimum wage rate only if done in accordance with 29 CFR 10.23, Deductions.

(7) The Contractor shall not discharge any part of its minimum wage obligation under this clause by furnishing fringe benefits or, with respect to workers whose wages are governed by the Service Contract Labor Standards statute, the cash equivalent thereof.

(8) Nothing in this clause shall excuse the Contractor from compliance with any applicable Federal or State prevailing wage law or any applicable law or municipal ordinance establishing a minimum wage higher than the E.O. minimum wage. However, wage increases under such other laws or municipal ordinances are not subject to price adjustment under this subpart.

(9) The Contractor shall pay the E.O. minimum wage rate whenever it is higher than any applicable collective bargaining agreement(s) wage rate.

(10) The Contractor shall follow the policies and procedures in 29 CFR 10.24(b) and 10.28 for treatment of workers engaged in an occupation in which they customarily and regularly receive more than $30 a month in tips.

(c)(1) This clause applies to workers as defined in paragraph (a). As provided in that definition-

(i) Workers are covered regardless of the contractual relationship alleged to exist between the contractor or subcontractor and the worker;

(ii) Workers with disabilities whose wages are calculated pursuant to special certificates issued under 29 U.S.C. 214(c) are covered; and

(iii) Workers who are registered in a bona fide apprenticeship program or training program registered with the Department of Labor’s Employment and Training Administration, Office of Apprenticeship, or with a State Apprenticeship Agency recognized by the Office of Apprenticeship, are covered.

(2) This clause does not apply to-

(i) Fair Labor Standards Act (FLSA)-covered individuals performing in connection with contracts covered by the E.O., i.e. those individuals who perform duties necessary to the performance of the contract, but who are not directly engaged in performing the specific work called for by the contract, and who spend less than 20 percent of their hours worked in a particular workweek performing in connection with such contracts;

(ii) Individuals exempted from the minimum wage requirements of the FLSA under 29 U.S.C. 213(a) and 214(a) and (b), unless otherwise covered by the Service Contract Labor Standards statute, or the Wage Rate Requirements (Construction) statute. These individuals include but are not limited to-

(A) Learners, apprentices, or messengers whose
wages are calculated pursuant to special certificates issued under 29 U.S.C. 214(a).

(B) Students whose wages are calculated pursuant to special certificates issued under 29 U.S.C. 214(b).

(C) Those employed in a bona fide executive, administrative, or professional capacity (29 U.S.C. 213(a)(1) and 29 CFR part 541).

(d) Notice. The Contractor shall notify all workers performing work on, or in connection with, this contract of the applicable E.O. minimum wage rate under this clause. With respect to workers covered by the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute, the Contractor may meet this requirement by posting, in a prominent and accessible place at the worksite, the applicable wage determination under those statutes. With respect to workers whose wages are governed by the FLSA, the Contractor shall post notice, utilizing the poster provided by the Administrator, which can be obtained at www.dol.gov/whd/govcontracts, in a prominent and accessible place at the worksite. Contractors that customarily post notices to workers electronically may post the notice electronically provided the electronic posting is displayed prominently on any Web site that is maintained by the contractor, whether external or internal, and customarily used for notices to workers about terms and conditions of employment.

(e) Payroll Records.

(1) The Contractor shall make and maintain records, for three years after completion of the work, containing the following information for each worker:

   (i) Name, address, and social security number;

   (ii) The worker’s occupation(s) or classification(s);

   (iii) The rate or rates of wages paid;

   (iv) The number of daily and weekly hours worked by each worker;

   (v) Any deductions made; and

   (vi) Total wages paid.

(2) The Contractor shall make records pursuant to paragraph (e)(1) of this clause available for inspection and transcription by authorized representatives of the Administrator. The Contractor shall also make such records available upon request of the Contracting Officer.

(3) The Contractor shall make a copy of the contract available, as applicable, for inspection or transcription by authorized representatives of the Administrator.

(4) Failure to comply with this paragraph (e) shall be a violation of 29 CFR 10.26 and this contract. Upon direction of the Administrator or upon the Contracting Officer's own action, payment shall be withheld until such time as the noncompliance is corrected.
(5) Nothing in this clause limits or otherwise modifies the Contractor’s payroll and recordkeeping obligations, if any, under the Service Contract Labor Standards statute, the Wage Rate Requirements (Construction) statute, the Fair Labor Standards Act, or any other applicable law.

(f) Access. The Contractor shall permit authorized representatives of the Administrator to conduct investigations, including interviewing workers at the worksite during normal working hours.

(g) Withholding. The Contracting Officer, upon his or her own action or upon written request of the Administrator, will withhold funds or cause funds to be withheld, from the Contractor under this or any other Federal contract with the same Contractor, sufficient to pay workers the full amount of wages required by this clause.

(h) Disputes. Department of Labor has set forth in 29 CFR 10.51, Disputes concerning contractor compliance, the procedures for resolving disputes concerning a contractor’s compliance with Department of Labor regulations at 29 CFR part 10. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. These disputes include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the Department of Labor, or the workers or their representatives.

(i) Antiretaliation. The Contractor shall not discharge or in any other manner discriminate against any worker because such worker has filed any complaint or instituted or caused to be instituted any proceeding under or related to compliance with the E.O. or this clause, or has testified or is about to testify in any such proceeding.

(j) Subcontractor compliance. The Contractor is responsible for subcontractor compliance with the requirements of this clause and may be held liable for unpaid wages due subcontractor workers.

(k) Subcontracts. The Contractor shall include the substance of this clause, including this paragraph (k) in all subcontracts, regardless of dollar value, that are subject to the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute, and are to be performed in whole or in part in the United States.

(End of clause)

1.70 *FAR 52.222-62 PAID SICK LEAVE UNDER EXECUTIVE ORDER 13706 (JAN 2017)

(a) Definitions. As used in this clause (in accordance with 29 CFR 13.2)-

"Child", "domestic partner", and "domestic violence" have the meaning given in 29 CFR 13.2.

"Employee"-

(1)(i) Means any person engaged in performing work on or in connection with a contract covered by Executive Order (E.O.) 13706, and

(A) Whose wages under such contract are governed by the Service Contract Labor Standards statute (41 U.S.C. chapter 67), the Wage Rate Requirements (Construction) statute (40 U.S.C. chapter 31, subchapter IV), or the Fair Labor Standards Act (29 U.S.C. chapter 8),
(B) Including employees who qualify for an exemption from the Fair Labor Standards Act's minimum wage and overtime provisions,

(C) Regardless of the contractual relationship alleged to exist between the individual and the employer; and

(ii) Includes any person performing work on or in connection with the contract and individually registered in a bona fide apprenticeship or training program registered with the Department of Labor’s Employment and Training Administration, Office of Apprenticeship, or with a State Apprenticeship Agency recognized by the Office of Apprenticeship.

(2)(i) An employee performs “on” a contract if the employee directly performs the specific services called for by the contract; and

(ii) An employee performs “in connection with” a contract if the employee’s work activities are necessary to the performance of a contract but are not the specific services called for by the contract.

“Individual related by blood or affinity whose close association with the employee is the equivalent of a family relationship” has the meaning given in 29 CFR 13.2.

“Multiemployer” plan means a plan to which more than one employer is required to contribute and which is maintained pursuant to one or more collective bargaining agreements between one or more employee organizations and more than one employer.

“Paid sick leave” means compensated absence from employment that is required by E.O. 13706 and 29 CFR part 13.

“Parent”, “sexual assault”, “spouse”, and “stalking” have the meaning given in 29 CFR 13.2.

“United States” means the 50 States and the District of Columbia.

(b) Executive Order 13706.

(1) This contract is subject to E.O. 13706 and the regulations issued by the Secretary of Labor in 29 CFR part 13 pursuant to the E.O.

(2) If this contract is not performed wholly within the United States, this clause only applies with respect to that part of the contract that is performed within the United States.

(c) Paid sick leave. The Contractor shall–

(1) Permit each employee engaged in performing work on or in connection with this contract to earn not less than 1 hour of paid sick leave for every 30 hours worked;

(2) Allow accrual and use of paid sick leave as required by E.O. 13706 and 29 CFR part 13;

(3) Comply with the accrual, use, and other requirements set forth in 29 CFR 13.5 and 13.6, which are incorporated by reference in this contract;

(4) Provide paid sick leave to all employees when due free and clear and
without subsequent deduction (except as otherwise provided by 29 CFR 13.24), rebate, or kickback on any account;

(5) Provide pay and benefits for paid sick leave used no later than one pay period following the end of the regular pay period in which the paid sick leave was taken; and

(6) Be responsible for the compliance by any subcontractor with the requirements of E.O. 13706, 29 CFR part 13, and this clause.

(d) Contractors may fulfill their obligations under E.O. 13706 and 29 CFR part 13 jointly with other contractors through a multiemployer plan, or may fulfill their obligations through an individual fund, plan, or program (see 29 CFR 13.8).

(e) Withholding. The Contracting Officer will, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this or any other Federal contract with the same Contractor, so much of the accrued payments or advances as may be considered necessary to pay employees the full amount owed to compensate for any violation of the requirements of E.O. 13706, 29 CFR part 13, or this clause, including—

(1) Any pay and/or benefits denied or lost by reason of the violation;

(2) Other actual monetary losses sustained as a direct result of the violation; and

(3) Liquidated damages.

(f) Payment suspension/contract termination/contractor debarment.

(1) In the event of a failure to comply with E.O. 13706, 29 CFR part 13, or this clause, the contracting agency may, on its own action or after authorization or by direction of the Department of Labor and written notification to the Contractor take action to cause suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(2) Any failure to comply with the requirements of this clause may be grounds for termination for default or cause.

(3) A breach of the contract clause may be grounds for debarment as a contractor and subcontractor as provided in 29 CFR 13.52.

(g) The paid sick leave required by E.O. 13706, 29 CFR part 13, and this clause is in addition to the Contractor’s obligations under the Service Contract Labor Standards statute and Wage Rate Requirements (Construction) statute, and the Contractor may not receive credit toward its prevailing wage or fringe benefit obligations under those Acts for any paid sick leave provided in satisfaction of the requirements of E.O. 13706 and 29 CFR part 13.

(h) Nothing in E.O. 13706 or 29 CFR part 13 shall excuse noncompliance with or supersede any applicable Federal or State law, any applicable law or municipal ordinance, or a collective bargaining agreement requiring greater paid sick leave or leave rights than those established under E.O. 13706 and 29 CFR part 13.
(i) Recordkeeping

(1) The Contractor shall make and maintain, for no less than three (3) years from the completion of the work on the contract, records containing the following information for each employee, which the Contractor shall make available upon request for inspection, copying, and transcription by authorized representatives of the Administrator of the Wage and Hour Division of the Department of Labor:

(i) Name, address, and social security number of each employee.

(ii) The employee’s occupation(s) or classification(s).

(iii) The rate or rates of wages paid (including all pay and benefits provided).

(iv) The number of daily and weekly hours worked.

(v) Any deductions made.

(vi) The total wages paid (including all pay and benefits provided) each pay period.

(vii) A copy of notifications to employees of the amount of paid sick leave the employee has accrued, as required under 29 CFR 13.5(a)(2).

(viii) A copy of employees’ requests to use paid sick leave, if in writing, or, if not in writing, any other records reflecting such employee requests.

(ix) Dates and amounts of paid sick leave taken by employees (unless the Contractor’s paid time off policy satisfies the requirements of E.O. 13706 and 29 CFR part 13 as described in 29 CFR 13.5(f)(5), leave shall be designated in records as paid sick leave pursuant to E.O. 13706).

(x) A copy of any written responses to employees’ requests to use paid sick leave, including explanations for any denials of such requests, as required under 29 CFR 13.5(d)(3).

(xi) Any records reflecting the certification and documentation the Contractor may require an employee to provide under 29 CFR 13.5(e), including copies of any certification or documentation provided by an employee.

(xii) Any other records showing any tracking of or calculations related to an employee’s accrual or use of paid sick leave.

(xiii) The relevant contract.

(xiv) The regular pay and benefits provided to an employee for each use of paid sick leave.

(xv) Any financial payment made for unused paid sick leave upon a separation from employment intended, pursuant to 29 CFR 13.5(b)(5), to relieve the Contractor from the obligation to reinstate such paid sick leave as otherwise required by 29 CFR 13.5(b)(4).

(2)(i) If the Contractor wishes to distinguish between an employee’s covered and noncovered work, the Contractor shall keep records or other proof reflecting such distinctions. Only if the Contractor adequately
segregates the employee’s time will time spent on noncovered work be
excluded from hours worked counted toward the accrual of paid sick leave.
Similarly, only if the Contractor adequately segregates the employee’s time
may the Contractor properly refuse an employee’s request to use paid sick
leave on the ground that the employee was scheduled to perform noncovered
work during the time he or she asked to use paid sick leave.

(ii) If the Contractor estimates covered hours worked by an employee who
performs work in connection with contracts covered by the E.O. pursuant to
29 CFR 13.5(a)(i) or (iii), the Contractor shall keep records or other
proof of the verifiable information on which such estimates are reasonably
based. Only if the Contractor relies on an estimate that is reasonable and
based on verifiable information will an employee’s time spent in connection
with noncovered work be excluded from hours worked counted toward the
accrual of paid sick leave. If the Contractor estimates the amount of time
an employee spends performing in connection with contracts covered by the
E.O., the Contractor shall permit the employee to use his or her paid sick
leave during any work time for the Contractor.

(3) In the event the Contractor is not obligated by the Service Contract
Labor Standards statute, the Wage Rate Requirements (Construction) statute,
or the Fair Labor Standards Act to keep records of an employee’s hours
worked, such as because the employee is exempt from the Fair Labor
Standards Act’s minimum wage and overtime requirements, and the Contractor
chooses to use the assumption permitted by 29 CFR 13.5(a)(1)(iii), the
Contractor is excused from the requirement in paragraph (i)(1)(iv) of this
clause and 29 CFR 13.25(a)(4) to keep records of the employee’s number of
daily and weekly hours worked.

(4)(i) Records relating to medical histories or domestic violence, sexual
assault, or stalking, created for purposes of E.O. 13706, whether of an
employee or an employee’s child, parent, spouse, domestic partner, or other
individual related by blood or affinity whose close association with the
employee is the equivalent of a family relationship, shall be maintained as
confidential records in separate files/records from the usual personnel
files.

(ii) If the confidentiality requirements of the Genetic Information
Nondiscrimination Act of 2008 (GINA), section 503 of the Rehabilitation Act
of 1973, and/or the Americans with Disabilities Act (ADA) apply to records
or documents created to comply with the recordkeeping requirements in this
contract clause, the records and documents shall also be maintained in
compliance with the confidentiality requirements of the GINA, section 503
of the Rehabilitation Act of 1973, and/or ADA as described in 29 CFR
1635.9, 41 CFR 60-741.23(d), and 29 CFR 1630.14(c)(1), respectively.

(iii) The Contractor shall not disclose any documentation used to verify
the need to use 3 or more consecutive days of paid sick leave for the
purposes listed in 29 CFR 13.5(c)(1)(iv) (as described in 29 CFR
13.5(e)(1)(ii)) and shall maintain confidentiality about any domestic
abuse, sexual assault, or stalking, unless the employee consents or when
disclosure is required by law.

(5) The Contractor shall permit authorized representatives of the Wage and
Hour Division to conduct interviews with employees at the worksite during
normal working hours.

(6) Nothing in this contract clause limits or otherwise modifies the
Contractor’s recordkeeping obligations, if any, under the Service Contract
Labor Standards statute, the Wage Rate Requirements (Construction) statute, the Fair Labor Standards Act, the Family and Medical Leave Act, E.O. 13658, their respective implementing regulations, or any other applicable law.

(j) Interference/discrimination.

(1) The Contractor shall not in any manner interfere with an employee’s accrual or use of paid sick leave as required by E.O. 13706 or 29 CFR part 13. Interference includes, but is not limited to-

   (i) Miscalculating the amount of paid sick leave an employee has accrued;
   
   (ii) Denying or unreasonably delaying a response to a proper request to use paid sick leave;
   
   (iii) Discouraging an employee from using paid sick leave;
   
   (iv) Reducing an employee’s accrued paid sick leave by more than the amount of such leave used;
   
   (v) Transferring an employee to work on contracts not covered by the E.O. to prevent the accrual or use of paid sick leave;
   
   (vi) Disclosing confidential information contained in certification or other documentation provided to verify the need to use paid sick leave; or
   
   (vii) Making the use of paid sick leave contingent on the employee’s finding a replacement worker or the fulfillment of the Contractor’s operational needs.

(2) The Contractor shall not discharge or in any other manner discriminate against any employee for-

   (i) Using, or attempting to use, paid sick leave as provided for under E.O. 13706 and 29 CFR part 13;
   
   (ii) Filing any complaint, initiating any proceeding, or otherwise asserting any right or claim under E.O. 13706 and 29 CFR part 13;
   
   (iii) Cooperating in any investigation or testifying in any proceeding under E.O. 13706 and 29 CFR part 13; or
   
   (iv) Informing any other person about his or her rights under E.O. 13706 and 29 CFR part 13.

(k) Notice. The Contractor shall notify all employees performing work on or in connection with a contract covered by the E.O. of the paid sick leave requirements of E.O. 13706, 29 CFR part 13, and this clause by posting a notice provided by the Department of Labor in a prominent and accessible place at the worksite so it may be readily seen by employees. Contractors that customarily post notices to employees electronically may post the notice electronically, provided such electronic posting is displayed prominently on any website that is maintained by the Contractor, whether external or internal, and customarily used for notices to employees about terms and conditions of employment.

(l) Disputes concerning labor standards. Disputes related to the application of E.O. 13706 to this contract shall not be subject to the general disputes clause of the contract. Such disputes shall be resolved in
accordance with the procedures of the Department of Labor set forth in 29 CFR part 13. Disputes within the meaning of this contract clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the Department of Labor, or the employees or their representatives.

(m) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (m), in all subcontracts, regardless of dollar value, that are subject to the Service Contract Labor Standards statute or the Wage Rate Requirements (Construction) statute, and are to be performed in whole or in part in the United States.

1.71 *FAR 52.222-60 PAYCHECK TRANSPARENCY (EXECUTIVE ORDER 13673) (OCT 2016)

(a) Wage statement. In each pay period, the Contractor shall provide a wage statement document (e.g. a pay stub) to all individuals performing work under the contract subject to the wage records requirements of any of the following statutes:


(2) 40 U.S.C. chapter 31, subchapter IV, Wage Rate Requirements (Construction) (formerly known as the Davis Bacon Act).


(b) Content of wage statement.

(1) The wage statement shall be issued every pay period and contain-

(i) The total number of hours worked in the pay period;

(ii) The number of those hours that were overtime hours;

(iii) The rate of pay (e.g., hourly rate, piece rate);

(iv) The gross pay; and

(v) Any additions made to or deductions taken from gross pay. These shall be itemized. The itemization shall identify and list each one separately, as well as the specific amount added or deducted for each.

(2) If the wage statement is not provided weekly and is instead provided bi-weekly or semi-monthly (because the pay period is bi-weekly or semi-monthly), the hours worked and overtime hours contained in the wage statement shall be broken down to correspond to the period (which will almost always be weekly) for which overtime is calculated and paid.

(3) The wage statement provided to an individual exempt from the overtime compensation requirements of the Fair Labor Standards Act (FLSA) need not include a record of hours worked, if the Contractor informs the individual in writing of his or her overtime exempt status. The notice may not indicate or suggest that DOL or the courts agree with the Contractor’s determination that the individual is exempt. The notice must be given either before the individual begins work on the contract, or in the first
wage statement under the contract. Notice given before the work begins can be a stand-alone document, or can be in an offer letter, employment contract, or position description. If during performance of the contract, the Contractor determines that the individual’s status has changed from non-exempt to exempt from overtime, it must provide the notice to the individual before providing a wage statement without hours worked information or in the first wage statement after the change.

(c) Substantially similar laws. A Contractor satisfies this wage statement requirement by complying with the wage statement requirement of any State or locality (in which the Contractor has employees) that has been determined by the United States Secretary of Labor to be substantially similar to the wage statement requirement in this clause. The determination of substantially similar wage payment states may be found at www.dol.gov/fairpayandsafeworkplaces.

(d) Independent contractor.

(1) If the Contractor is treating an individual performing work under the contract as an independent contractor (e.g., an individual who is in business for him or herself or is self-employed) and not as an employee, the Contractor shall provide a written document to the individual informing the individual of this status. The document may not indicate or suggest that the enforcement agencies or the courts agree with the Contractor’s determination that the worker is an independent contractor. The Contractor shall provide the document to the individual either at the time an independent contractor relationship is established with the individual or prior to the time the individual begins to perform work on the contract. The document must be provided for this contract, even if the worker was notified of independent contractor status on other contracts. The document must be separate from any independent contractor agreement between the Contractor and the individual. If the Contractor determines that a worker’s status while performing work on the contract changes from employee to independent contractor, then the Contractor shall provide the worker with notice of independent contractor status before the worker performs any work under the contract as an independent contractor.

(2) The fact that the Contractor does not make social security, Medicare, or income tax withholding deductions from the individual’s pay and that an individual receives at year end an IRS Form 1099-Misc is not evidence that the Contractor has correctly classified the individual as an independent contractor under the labor laws.

(e) Notices.

(1) Language. Where a significant portion of the workforce is not fluent in English, the Contractor shall provide the wage statement required in paragraph (a) of this clause, the overtime exempt status notice described in paragraph (b)(3) of this clause, and the independent contractor notification required in paragraph (d) of this clause in English and the language(s) with which the significant portion(s) of the workforce is fluent.

(2) Electronic notice. If the Contractor regularly provides documents to its workers by electronic means, the Contractor may provide to workers electronically the written documents and notices required by this clause. Workers must be able to access the document through a computer, device, system or network provided or made available by the Contractor.
(f) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (f), in all subcontracts that exceed $500,000, at all tiers, for other than commercially available off-the-shelf items.

(End of clause)

1.72 *FAR 52.222-61 ARBITRATION OF CONTRACTOR EMPLOYEE CLAIMS (EXECUTIVE ORDER 13673) (DEC 2016)

(a) The Contractor hereby agrees that the decision to arbitrate claims arising under title VII of the Civil Rights Act of 1964, or any tort related to or arising out of sexual assault or harassment, shall only be made with the voluntary consent of employees or independent contractors after such disputes arise.

(b) This does not apply to-

(1) Employees covered by a collective bargaining agreement negotiated between the Contractor and a labor organization representing the employees; or

(2) Employees or independent contractors who entered into a valid contract to arbitrate prior to the Contractor bidding on a contract containing this clause, implementing Executive Order 13673. This exception does not apply:

(i) If the contractor is permitted to change the terms of the contract with the employee or independent contractor; or

(ii) When the contract with the employee or independent contractor is renegotiated or replaced.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts that exceed $1,000,000. This paragraph does not apply to subcontracts for commercial items.

Note to 52.222-61: By a court order issued on October 24, 2016, 52.222-61 is enjoined indefinitely as of the date of the order. The enjoined section will become effective immediately if the court terminates the injunction. At that time, GSA, DoD and NASA will publish a document in the Federal Register advising the public of the termination of the injunction.

(End of clause)

1.73 *FAR 52.223-2 AFFIRMATIVE PROCUREMENT OF BIOBASED PRODUCTS UNDER SERVICE AND CONSTRUCTION CONTRACTS (SEPT 2013)

(a) In the performance of this contract, the contractor shall make maximum use of biobased products that are United States Department of Agriculture (USDA)-designated items unless-

(1) The product cannot be acquired—

(i) Competitively within a time frame providing for compliance with the contract performance schedule;

(ii) Meeting contract performance requirements; or

(iii) At a reasonable price.
(2) The product is to be used in an application covered by a USDA categorical exemption (see 7 CFR 3201.3(e)). For example, all USDA-designated items are exempt from the preferred procurement requirement for the following:

(i) Spacecraft system and launch support equipment.

(ii) Military equipment, i.e., a product or system designed or procured for combat or combat-related missions.

(b) Information about this requirement and these products is available at http://www.biopreferred.gov.

(c) In the performance of this contract, the Contractor shall—

(1) Report to http://www.sam.gov, with a copy to the Contracting Officer, on the product types and dollar value of any USDA-designated biobased products purchased by the Contractor during the previous Government fiscal year, between October 1 and September 30; and

(2) Submit this report no later than—

(i) October 31 of each year during contract performance; and

(ii) At the end of contract performance.

(End of clause)

1.74 *FAR 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

(a) "Hazardous material," as used in this clause, includes any material defined as hazardous under the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract).

(b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

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<th>Material</th>
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(c) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313, for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with Federal Standard No. 313, whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsible and ineligible for award.
(e) If, after award, there is a change in the composition of the item(s) or a revision to Federal Standard No. 313, which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:
   (1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to
      (i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;
      (ii) Obtain medical treatment for those affected by the material; and
      (iii) Have others use, duplicate, and disclose the data for the Government for these purposes.
   (2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.
   (3) The Government is not precluded from using similar or identical data acquired from other sources.

(End of clause)

1.75 *FAR 52.223-5  POLLUTION PREVENTION AND RIGHT TO KNOW INFORMATION
(MAY 2011)

(a) Definitions. As used in this clause-
   "Toxic chemical" means a chemical or chemical category listed in 40 CFR 372.65.

(b) Federal facilities are required to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001-11050), and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101-13109).

(c) The Contractor shall provide all information needed by the Federal facility to comply with the following:
   (1) The emergency planning reporting requirements of Section 302 of EPCRA.
   (2) The emergency notice requirements of Section 304 of EPCRA.
   (3) The list of Material Safety Data Sheets, required by Section 311 of EPCRA.
   (4) The emergency and hazardous chemical inventory forms of Section 312 of EPCRA.
   (5) The toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA.
   (6) The toxic chemical and hazardous substance release and use reduction goals of section 2(e) of Executive Order 13423 and of Executive
1.76 *FAR 52.223-6  DRUG-FREE WORKPLACE (MAY 2001)

(a) Definitions. As used in this clause--
"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.
"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.
"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.
"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract where employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.
"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.
"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) The Contractor, if other than an individual, shall--within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration--

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about--
   (i) The dangers of drug abuse in the workplace;
   (ii) The Contractor's policy of maintaining a drug-free workplace;
   (iii) Any available drug counseling, rehabilitation, and employee assistance programs; and
   (iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will--
   (i) Abide by the terms of the statement; and
   (ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an
employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.560, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

(End of clause)

1.77 FAR 52.223-9 ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS (MAY 2008)

(a) Definitions. As used in this clause-

"Postconsumer material" means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of "recovered material."

"Recovered material" means waste materials and by-products recovered or diverted from solid waste, but the term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

(b) The Contractor, on completion of this contract, shall-

(1) Estimate the percentage of the total recovered material content for EPA-designated item(s) delivered and/or used in contract performance, including, if applicable, the percentage of post-consumer material content; and

(2) Submit this estimate to the Contracting Officer.

(End of clause)

1.78 FAR 52.223-17 AFFIRMATIVE PROCUREMENT OF EPA-DESIGNATED ITEMS IN SERVICE AND CONSTRUCTION CONTRACTS (MAY 2008)

(a) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired-

(1) Competitively within a timeframe providing for compliance
with the contract performance schedule;
(2) Meeting contract performance requirements; or
(3) At a reasonable price.

(b) Information about this requirement is available at EPA's Comprehensive Procurement Guidelines web site, http://www.epa.gov/cpg/. The list of EPA-designated items is available at http://www.epa.gov/cpg/products.htm.

(End of clause)

1.79 FAR 52.223-18 ENCOURAGING CONTRACTOR POLICIES TO BAN TEXT MESSAGING WHILE DRIVING (AUG 2011)

(a) Definitions. As used in this clause--

"Driving"-
(1) Means operating a motor vehicle on an active roadway with the motor running, including while temporarily stationary because of traffic, a traffic light, stop sign, or otherwise.
(2) Does not include operating a motor vehicle with or without the motor running when one has pulled over to the side of, or off, an active roadway and has halted in a location where one can safely remain stationary.

"Text messaging" means reading from or entering data into any handheld or other electronic device, including for the purpose of short message service texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any other form of electronic data retrieval or electronic data communication. The term does not include glancing at or listening to a navigational device that is secured in a commercially designed holder affixed to the vehicle, provided that the destination and route are programmed into the device either before driving or while stopped in a location off the roadway where it is safe and legal to park.

(b) This clause implements Executive Order 13513, Federal Leadership on Reducing Text Messaging while Driving, dated October 1, 2009.

(c) The Contractor is encouraged to--
(1) Adopt and enforce policies that ban text messaging while driving--
(i) Company-owned or -rented vehicles or Government-owned vehicles; or
(ii) Privately-owned vehicles when on official Government business or when performing any work for or on behalf of the Government.
(2) Conduct initiatives in a manner commensurate with the size of the business, such as--
(i) Establishment of new rules and programs or re-evaluation of existing programs to prohibit text messaging while driving; and
(ii) Education, awareness, and other outreach to employees about the safety risks associated with texting while driving.
(d) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (d), in all subcontracts that exceed the micro-purchase threshold.

(End of clause)
1.80 RESERVED

1.81 *FAR 52.225-11 BUY AMERICAN-CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (OCT 2016)

(a) Definitions. As used in this clause-
"Commercially available off-the-shelf (COTS) item"—
(1) Means any item of supply (including construction material) that is—
   (i) A commercial item (as defined in paragraph (1) of the definition at FAR 2.101);
   (ii) Sold in substantial quantities in the commercial marketplace; and
   (iii) Offered to the Government, under a contract or subcontract at any tier, without modification, in the same form in which it is sold in the commercial marketplace; and
(2) Does not include bulk cargo, as defined in 46 U.S.C. 40102(4), such as agricultural products and petroleum products.
"Caribbean Basin country construction material" means a construction material that—
(1) Is wholly the growth, product, or manufacture of a Caribbean Basin country; or
(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a Caribbean Basin country into a new and different construction material distinct from the materials from which it was transformed.
"Component" means an article, material, or supply incorporated directly into a construction material.
"Construction material" means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.
"Cost of components" means—
(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or
(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.
"Designated country" means any of the following countries:
(1) A World Trade Organization Government Procurement Agreement
(WTO GPA) country (Armenia, Aruba, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea (Republic of), Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Montenegro, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan, Ukraine, or United Kingdom); 

(2) A Free Trade Agreement (FTA) country (Australia, Bahrain, Canada, Chile, Columbia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Korea (Republic of), Mexico, Morocco, Nicaragua, Oman, Panama, Peru, or Singapore); 

(3) A least developed country (Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Laos, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nepal, Niger, Rwanda, Samoa, Sao Tome and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, South Sudan, Tanzania, Timor-Leste, Togo, Tuvalu, Uganda, Vanuatu, Yemen, or Zambia); or 

(4) A Caribbean Basin country (Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saba, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Sint Bustinus, Sint Maarten, or Trinidad and Tobago).

"Designated country construction material" means a construction material that is a WTO GPA country construction material, an FTA country construction material, a least developed country construction material, or a Caribbean Basin country construction material.

"Domestic construction material" means-

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if-

(i) The cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic; or

(ii) The construction material is a COTS item.

"Foreign construction material" means a construction material other than a domestic construction material.

"Free Trade Agreement country construction material" means a construction material that-

(1) Is wholly the growth, product, or manufacture of a Free Trade Agreement (FTA) country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a FTA country into a new and different construction material distinct from the materials from which it was transformed.

"Least developed country construction material" means a construction material that-

(1) Is wholly the growth, product, or manufacture of a least developed country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a least developed country into a new and different construction material distinct from the materials from which it was transformed.
"United States" means the 50 States and the District of Columbia, and outlying areas.  
"WTO GPA country construction material" means a construction material that-

(1) Is wholly the growth, product, or manufacture of a WTO GPA country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a WTO GPA country into a new and different construction material distinct from the materials from which it was transformed.

(b) Construction materials.

(1) This clause implements 41 U.S.C. chapter 83, Buy American, by providing a preference for domestic construction material. In accordance with 41 U.S.C. 1907, the component test of the Buy American statute is waived for construction material that is a COTS item. (See FAR 12.505(a)(2)). In addition, the Contracting Officer has determined that the WTO GPA and Free Trade Agreements (FTAs) apply to this acquisition. Therefore, the Buy American restrictions are waived for designated country construction materials.

(2) The Contractor shall use only domestic or designated country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

(3) The requirement in paragraph (b)(2) of this clause does not apply to information technology that is a commercial item or to the construction materials or components listed by the Government as follows:

[Contracting Officer to list applicable excepted materials or indicate "none"]

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that-

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American statute is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American statute to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) Request for determination of inapplicability of the Buy American statute. (1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including-

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a
reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American statute applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American statute applies, use of foreign construction material is noncompliant with the Buy American statute.

(d) Data. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

<table>
<thead>
<tr>
<th>FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Material Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Item 1:</td>
</tr>
<tr>
<td>Foreign construction material</td>
</tr>
<tr>
<td>Domestic construction material</td>
</tr>
<tr>
<td>Item 2:</td>
</tr>
<tr>
<td>Foreign construction material</td>
</tr>
<tr>
<td>Domestic construction material</td>
</tr>
</tbody>
</table>

[List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]
[Include other applicable supporting information.]
[* Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]
(End of clause)
any proclamation, Executive order, or statute administered by OFAC, or if OFAC’s implementing regulations at 31 CFR chapter V, would prohibit such a transaction by a person subject to the jurisdiction of the United States.

(b) Except as authorized by OFAC, most transactions involving Cuba, Iran, and Sudan are prohibited, as are most imports from Burma or North Korea, into the United States or its outlying areas. Lists of entities and individuals subject to economic sanctions are included in OFAC’s List of Specially Designated Nationals and Blocked Persons at http://www.treas.gov/offices/enforcement/ofac/sdn. More information about these restrictions, as well as updates, is available in the OFAC’s regulations at 31 CFR chapter V and/or on OFAC’s website at http://www.treas.gov/offices/enforcement/ofac.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

(End of clause)

1.83  RESERVED

1.84  RESERVED

1.85  RESERVED

1.86  RESERVED

1.87  *FAR 52.227-1  AUTHORIZATION AND CONSENT (DEC 2007)

(a) The Government authorizes and consents to all use and manufacture, in performing this contract or any subcontract at any tier, of any invention described in and covered by a United States patent-

(1) Embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract; or

(2) Used in machinery, tools, or methods whose use necessarily results from compliance by the Contractor or a subcontractor with (i) specifications or written provisions forming a part of this contract or (ii) specific written instructions given by the Contracting Officer directing the manner of performance. the entire liability to the Government for infringement of a United States patent shall be determined solely by the provisions of the indemnity clause, if any, included in this contract or any subcontract hereunder (including any lower-tier subcontract), and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted.

(b) The Contractor shall include the substance of this clause, including this paragraph (b), in all subcontracts that are expected to exceed the simplified acquisition threshold. However, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.

(End of clause)

1.88  *FAR 52.227-2  NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (DEC 2007)

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copy-right infringement based on the performance of this contract of which the Contractor has knowledge.
(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed under this contract, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in the Contractor's possession pertaining to such claim or suit. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(c) The Contractor shall include the substance of this clause, including this paragraph (c), in all subcontracts that are expected to exceed the simplified acquisition threshold.

(End of clause)

1.89  *FAR 52.227-4  PATENT INDEMNITY--CONSTRUCTION CONTRACTS (DEC 2007)

Except as otherwise provided, the Contractor shall indemnify the Government and its officers, agents, and employees against liability, including costs and expenses, for infringement of any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under (35 U.S.C. 181) arising out of performing this contract or out of the use or disposal by or for the account of the Government of supplies furnished or work performed under this contract.

(End of clause)

1.90  *FAR 52.228-2  ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government;

(b) Any surety fails to furnish reports on its financial condition as required by the Government;

(c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or

(d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting Officer has the right to immediately draw on the ILC.

(End of clause)

1.91  *FAR 52.228-5  INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997)

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance of this contract, at least the kinds and minimum amounts of insurance required in the Schedule or elsewhere in the contract.

(b) Before commencing work under this contract, the Contractor shall notify the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective for such period as the laws of the State in which this
1.92 *FAR 52.228-11      PLEDGES OF ASSETS (JAN 2012)

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond--
   (1) Pledge of assets; and
   (2) Standard Form 28, Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of--
   (1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government securities held in book entry form); and/or
   (2) A recorded lien on real estate. The offeror will be required to provide--

       (i) A mortgagee title insurance policy, in an insurance amount equal to the amount of the lien, or other evidence of title that is consistent with the requirements of Section 2 of the United States Department of Justice Title Standards at http://www.justice.gov/enrd/ENRD_Assets/Title_Standards_2001.pdf. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);
       (ii) Evidence of the amount due under any encumbrance shown in the evidence of title;
       (iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

(End of clause)

1.93 *FAR 52.228-12      PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (MAY 2014)

In accordance with section 806(a)(3) of Pub. L. 102-190, as amended by sections 2091 and 8105 of Pub. L. 103-355 (10 U.S.C. 2302 note), upon the request of a prospective subcontractor or supplier offering to furnish labor or material for the performance of this contract for which a payment bond has been furnished to the Government pursuant to 40 U.S.C. chapter 31, subchapter III, Bonds, the Contractor shall promptly provide a copy of such payment bond to the requester.

(End of clause).
1.94 FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (NOV 2014)

(a) "Irrevocable letter of credit" (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and

1. If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;
2. If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC to cover the entire period of performance or may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an an initial expiration that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal of least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

1. For contracts subject to the 40 U.S.C. chapter 31, subchapter III, Bonds, the later of
   A. One year following the expected date of final payment;
   B. For performance bonds only, until completion of any warranty period; or
   C. For payment bonds only, until resolution of all claims filed against the payment bond during the one year period following final payment.
2. For contracts not subject to the 40 U.S.C. chapter 31, subchapter III, Bonds, the later of
   A. 90 days following final payment; or
   B. For performance bonds only, until completion of any warranty period.

(d)(1) Only federally insured financial institutions rated investment grade by a commercial rating service shall issue or confirm the ILC.

2. Unless the financial institution issuing the ILC had letter of credit business of at least $25 million in the past year, ILCs over $5 million must be confirmed by another acceptable financial institution that had letter of credit business of at least $25 million in the past year.

3. The Offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institutions have the required credit rating as of the date of issuance of the ILC.

4. The current rating for a financial institution is available through any of the following rating services registered with the U.S. Securities and Exchange Commission (SEC) as a Nationally Recognized
Statistical Rating Organization (NRSRO). NRSRO’s can be located at the website http://www.sec.gov/answers/nrsro.htm maintained by the SEC.

e) The following format shall be used by the issuing financial institution to create an ILC:

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date

Irrevocable Letter of Credit No.
Account party's name
Account party's address
For Solicitation No.
(For reference only)

TO: [U.S. Government agency]
[U.S. Government agency's address]
1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States $__________. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on ________, or any automatically extended expiration date.

2. We hereby undertake to honor your or transferee's sight draft(s) drawn on issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. ____________(Insert version in effect at the time of ILC issuance, e.g., "Publication 600, 2006 edition"), and to the extent not inconsistent therewith, to the laws of ____________ [State of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.
Sincerely,

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

[Confirming Financial Institution's Letterhead or Name and Address]

(Date)________________________

Our Letter of Credit
Advice Number
Beneficiary:
[U.S. Government agency]
Issuing Financial Institution:
Issuing Financial Institution's LC No.:

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by __________ [name of issuing financial institution] for drawings of up to United States dollars ________/U.S. $________ and expiring with our close of business on __________ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at ____________.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

   (a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

   (b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. __________ (Insert version in effect at the time of ILC issuance, e.g., "Publication 600, 2006 edition"), and to the extent not inconsistent therewith, to the laws of __________ [State of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:
SIGHT DRAFT

[City, State]

(Date)_____________________

[Name and address of financial institution]
Pay to the order of
[Beneficiary Agency] __________

the sum of United States $ __________

This draft is drawn under
Irrevocable Letter of Credit No.

[Beneficiary Agency]
By: ____________________

(End of clause)

1.95  *FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS - CONSTRUCTION (OCT 2010)

(a) Definitions. As used in this clause-

"Original contract price" means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) Amount of required bonds. Unless the resulting contract price is $150,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) Performance bonds (Standard Form 25). The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) Payment Bonds (Standard Form 25-A). The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) Additional bond protection. (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) Furnishing executed bonds. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) Surety or other security for bonds. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the:
(e) Notice of subcontractor waiver of protection (40 U.S.C. 3133(c)). Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.

(End of clause)

1.96 FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (FEB 2013)

(a) As used in this clause--

"All applicable Federal, State, and local taxes and duties," means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract.

"After-imposed Federal tax," means any new or increased Federal excise tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, on the transactions or property covered by this contract that the Contractor is required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date. It does not include social security tax or other employment taxes.

"After-relieved Federal tax," means any amount of Federal excise tax or duty, except social security or other employment taxes, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund or drawback, as the result of legislative, judicial, or administrative action taking effect after the contract date.

"Contract date," means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"Local taxes" includes taxes imposed by a possession or territory of the United States, Puerto Rico, or the Northern Mariana Islands, if the contract is performed wholly or partly in any of those areas.

(b)(1) The contract price includes all applicable Federal, State, and local taxes and duties, except as provided in subparagraph (b)(2)(i) of this clause.

(2) Taxes imposed under 26 U.S.C. 5000C may not be--

(i) Included in the contract price; nor

(ii) Reimbursed.

(c) The contract price shall be increased by the amount of any after-imposed Federal tax, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price, as a contingency reserve or otherwise.

(d) The contract price shall be decreased by the amount of any after-relieved Federal tax.

(e) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment
taxes, that the Contractor is required to pay or bear, or does not obtain a
refund of, through the Contractor's fault, negligence, or failure to follow
instructions of the Contracting Officer.

(f) No adjustment shall be made in the contract price under this
clause unless the amount of the adjustment exceeds $250.

(g) The Contractor shall promptly notify the Contracting Officer of
all matters relating to any Federal excise tax or duty that reasonably may
be expected to result in either an increase or decrease in the contract
price and shall take appropriate action as the Contracting Officer directs.

(h) The Government shall, without liability, furnish evidence
appropriate to establish exemption from any Federal, State, or local tax
when the Contractor requests such evidence and a reasonable basis exists to
sustain the exemption.

(End of clause)

1.97 *FAR 52.232-5  PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY
2014)

(a) Payment of Price. The Government shall pay the Contractor the
contract price as provided in this contract.

(b) Progress Payments. The Government shall make progress payments
monthly as the work proceeds, or at more frequent intervals as determined
by the Contracting Officer, on estimates of work accomplished which meets
the standards of quality established under the contract, as approved by the
Contracting Officer.

(1) The Contractor's request for progress payments shall
include the following substantiation:

(i) An itemization of the amounts requested, related to
the various elements of work required by the contract covered by the
payment requested.

(ii) A listing of the amount included for work performed
by each subcontractor under the contract.

(iii) A listing of the total amount of each subcontract
under the contract.

(iv) A listing of the amounts previously paid to each
such subcontractor under the contract.

(v) Additional supporting data in a form and detail
required by the Contracting Officer.

(2) In the preparation of estimates, the Contracting Officer
may authorize material delivered on the site and preparatory work done to
be taken into consideration. Material delivered to the Contractor at
locations other than the site also may be taken into consideration if

(i) Consideration is specifically authorized by this
contract; and

(ii) The Contractor furnishes satisfactory evidence that
it has acquired title to such material and that the material will be used
to perform this contract.

(c) Contractor Certification. Along with each request for progress
payments, the Contractor shall furnish the following certification, or
payment shall not be made: (However, if the Contractor elects to delete
paragraph (c)(4) from the certification, the certification is still
acceptable.) I hereby certify, to the best of my knowledge and belief, that

(1) The amounts requested are only for performance in
accordance with the specifications, terms, and conditions of the contract;

(2) All payments due to subcontractors and suppliers from
previous payments received under the contract have been made, and timely
payments will be made from the proceeds of the payment covered by this
certification, in accordance with subcontract agreements and the
requirements of chapter 39 of Title 31, United States Code;
(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and
(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

______________________________________________
(Name)

______________________________________________
(Title)

______________________________________________
(Date)

(d) Refund of Unearned Amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

(1) Notify the Contracting Officer of such performance deficiency; and
(2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until
   (i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or
   (ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, Liability, and Reservation of Rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or
(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for Bond Premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for
the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final Payment. The Government shall pay the amount due the Contractor under this contract after--

(1) Completion and acceptance of all work;
(2) Presentation of a properly executed voucher; and
(3) Presentation of release of all claims against the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 6305).

(i) Limitation Because of Undefinitized Work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on undefinitized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest Computation on Unearned Amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be

(1) Computed at the rate of average bond equivalent rates of 91 day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and
(2) Deducted from the next available payment to the Contractor.

(End of clause)

1.98 *FAR 52.232-17 INTEREST (MAY 2014)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Certified Cost or Pricing Data clause or a Cost Accounting Standards clause, all amounts that become payable by the Contractor to the Government under this contract shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in 41 U.S.C. 7109, which is applicable to the period in which the amount becomes due, as provided in paragraph (e) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid.

(b) The Government may issue a demand for payment to the Contractor upon finding a debt is due under the contract.

(c) Final Decisions. The Contracting Officer will issue a final decision as required by 33.211 if-

(1) The Contracting Officer and the Contractor are unable to reach agreement on the existence or amount of a debt in a timely manner;
(2) The Contractor fails to liquidate a debt previously demanded by the Contracting Officer within the timeline specified in the demand for payment unless the amounts were not repaid because the Contractor has requested an installment payment agreement; or
(3) The Contractor requests a deferment of collection on a debt
previously demanded by the Contracting Officer (see 32.607-2).

(d) If a demand for payment was previously issued for the debt, the demand for payment included in the final decision shall identify the same due date as the original demand for payment.

(e) Amounts shall be due at the earliest of the following dates:
   (1) The date fixed under this contract.
   (2) The date of the first written demand for payment, including any demand for payment resulting from a default termination.

(f) The interest charge shall be computed for the actual number of calendar days involved beginning on the due date and ending on:
   (1) The date on which the designated office receives payment from the Contractor;
   (2) The date of issuance of a Government check to the Contractor from which an amount otherwise payable has been withheld as a credit against the contract debt; or
   (3) The date on which an amount withheld and applied to the contract debt would otherwise have become payable to the Contractor.

(g) The interest charge made under this clause may be reduced under the procedures prescribed in 32.608-2 of the Federal Acquisition Regulation in effect on the date of this contract.

(End of clause)

1.99 *FAR 52.232-23 ASSIGNMENT OF CLAIMS (MAY 2014)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 6305 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

(End of clause)

1.100 *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (JAN 2017)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments under the terms and conditions specified in this clause. The Government considers payment as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101, 32.001, and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see paragraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments-(1) Types of invoice payments. For purposes of this clause, there are several types of invoice payments that may occur
under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project.

(A) The due date for making such payments is 14 days after the designated billing office receives a proper payment request. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date is the 14th day after the date of the Contractor’s payment request, provided the designated billing office receives a proper payment request and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, is as specified in the contract or, if not specified, 30 days after approval by the Contracting Officer for release to the Contractor.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (e.g., each separate building, public work, or other division of the contract for which the price is stated separately in the contract).

(A) The due date for making such payments is the later of the following two events:

(1) The 30th day after the designated billing office receives a proper invoice from the Contractor.

(2) The 30th day after Government acceptance of the work or services completed by the Contractor. For a final invoice when the payment amount is subject to contract settlement actions (e.g., release of claims), acceptance is deemed to occur on the effective date of the contract settlement.

(B) If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date is the 30th day after the date of the Contractor’s invoice, provided the designated billing office receives a proper invoice and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(2) Contractor’s invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(2)(i) through (a)(2)(xi) of this clause. If the invoice does not comply with these requirements, the designated billing office must return it within 7 days after receipt, with the reasons why it is not a proper invoice. When computing any interest penalty owed the Contractor, the Government will take into account if the Government notifies the Contractor of an improper invoice in an untimely manner.

(i) Name and address of the Contractor.

(ii) Invoice date and invoice number. (The Contractor should date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (e.g., discount for prompt payment terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a
proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to notify in the event of a defective invoice.

(viii) For payments described in paragraph (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts.

(ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(x) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision (e.g., 52.232-38, Submission of Electronic Funds Transfer Information with Offer), contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer-System for Award Management, or 52.232-34, Payment by Electronic Funds Transfer-Other Than System for Award Management), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(xi) Any other information or documentation required by the contract.

(3) Interest penalty. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday, the designated payment office may make payment on the following working day without incurring a late payment interest penalty.

(i) The designated billing office received a proper invoice.

(ii) The Government processed a receiving report or other Government documentation authorizing payment and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) Computing penalty amount. The Government will compute the interest penalty in accordance with the Office of Management and Budget prompt payment regulations at 5 CFR part 1315.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in paragraph (a)(1)(ii) of this clause, Government acceptance or approval is deemed to occur constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract. If actual acceptance or approval occurs within the constructive acceptance or approval period, the Government will base the determination of an interest penalty on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.
The prompt payment regulations at 5 CFR 1315.10(c) do not require the Government to pay interest penalties if payment delays are due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. The Government and the Contractor shall resolve claims involving disputes, and any interest that may be payable in accordance with the clause at FAR 52.233-1, Disputes.

(5) Discounts for prompt payment. The designated payment office will pay an interest penalty automatically, without request from the Contractor, if the Government takes a discount for prompt payment improperly. The Government will calculate the interest penalty in accordance with the prompt payment regulations at 5 CFR part 1315.

(6) Additional interest penalty. (i) The designated payment office will pay a penalty amount, calculated in accordance with the prompt payment regulations at 5 CFR part 1315 in addition to the interest penalty amount only if-

(A) The Government owes an interest penalty of $1 or more;

(B) The designated payment office does not pay the interest penalty within 10 days after the date the invoice amount is paid; and

(C) The Contractor makes a written demand to the designated payment office for additional penalty payment, in accordance with paragraph (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) The Contractor shall support written demands for additional penalty payments with the following data. The Government will not request any additional data. The Contractor shall-

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) If there is no postmark or the postmark is illegible-

(1) The designated payment office that receives the demand will annotate it with the date of receipt provided the demand is received on or before the 40th day after payment was made; or

(2) If the designated payment office fails to make the required annotation, the Government will determine the demand's validity based on the date the Contractor has placed on the demand, provided such date is no later than the 40th day after payment was made.

(b) Contract financing payments. If this contract provides for contract financing, the Government will make contract financing payments in accordance with the applicable contract financing clause.

(c) Subcontract clause requirements. The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) Prompt payment for subcontractors. A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) Interest for subcontractors. An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest...
penalty for each payment not made in accordance with the payment clause-
   (i) For the period beginning on the day after the
   required payment date and ending on the date on which payment of the amount
due is made; and
   (ii) Computed at the rate of interest established by the
   Secretary of the Treasury, and published in the Federal Register, for
   interest payments under 41 U.S.C. 7109 in effect at the time the Contractor
accrues the obligation to pay an interest penalty.

(3) Subcontractor clause flowdown. A clause requiring each
subcontractor to
   (i) Include a payment clause and an interest penalty
clause conforming to the standards set forth in paragraphs (c)(1) and
(c)(2) of this clause in each of its subcontracts; and
   (ii) Require each of its subcontractors to include such
clauses in their subcontracts with each lower-tier subcontractor or
supplier.

(d) Subcontract clause interpretation. The clauses required by
paragraph (c) of this clause shall not be construed to impair the right of
the Contractor or a subcontractor at any tier to negotiate, and to include
in their subcontract, provisions that-
   (1) Retainage permitted. Permit the Contractor or a
subcontractor to retain (without cause) a specified percentage of each
progress payment otherwise due to a subcontractor for satisfactory
performance under the subcontract without incurring any obligation to pay a
late payment interest penalty, in accordance with terms and conditions
agreed to by the parties to the subcontract, giving such recognition as the
parties deem appropriate to the ability of a subcontractor to furnish a
performance bond and a payment bond;
   (2) Withholding permitted. Permit the Contractor or
subcontractor to make a determination that part or all of the
subcontractor's request for payment may be withheld in accordance with the
subcontract agreement; and
   (3) Withholding requirements. Permit such withholding without
incurring any obligation to pay a late payment penalty if-
      (i) A notice conforming to the standards of paragraph (g)
of this clause previously has been furnished to the subcontractor; and
      (ii) The Contractor furnishes to the Contracting Officer
a copy of any notice issued by a Contractor pursuant to paragraph (d)(3)(i)
of this clause.

(e) Subcontractor withholding procedures. If a Contractor, after
making a request for payment to the Government but before making a payment
to a subcontractor for the subcontractor's performance covered by the
payment request, discovers that all or a portion of the payment otherwise
due such subcontractor is subject to withholding from the subcontractor in
accordance with the subcontract agreement, then the Contractor shall-
   (1) Subcontractor notice. Furnish to the subcontractor a notice
conforming to the standards of paragraph (g) of this clause as soon as
practicable upon ascertaining the cause giving rise to a withholding, but
prior to the due date for subcontractor payment;
   (2) Contracting Officer notice. Furnish to the Contracting
Officer, as soon as practicable, a copy of the notice furnished to the
subcontractor pursuant to paragraph (e)(1) of this clause;
   (3) Subcontractor progress payment reduction. Reduce the
subcontractor's progress payment by an amount not to exceed the amount
specified in the notice of withholding furnished under paragraph (e)(1) of
this clause;
   (4) Subsequent subcontractor payment. Pay the subcontractor as
soon as practicable after the correction of the identified subcontract
performance deficiency, and-
(i) Make such payment within-
  (A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under paragraph (e)(5)(i) of this clause; or
  (B) Seven days after the Contractor recovers such funds from the Government; or
(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under 41 U.S.C. 7109 in effect at the time the Contractor accrues the obligation to pay an interest penalty;
(5) Notice to Contracting Officer. Notify the Contracting Officer upon-
  (i) Reduction of the amount of any subsequent certified application for payment; or
  (ii) Payment to the subcontractor of any withheld amounts of a progress payment, specifying-
     (A) The amounts withheld under paragraph (e)(1) of this clause; and
     (B) The dates that such withholding began and ended; and
(6) Interest to Government. Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until-
  (i) The day the identified subcontractor performance deficiency is corrected; or
  (ii) The date that any subsequent payment is reduced under paragraph (e)(5)(i) of this clause.
(f) Third-party deficiency reports-(1) Withholding from subcontractor. If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a 'second-tier subcontractor') a written notice in accordance with the 40 U.S.C. 3133), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under paragraph (e)(6) of this clause-
  (i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and
  (ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (f)(1)(i) of this clause.
(2) Subsequent payment or interest charge. As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall-
  (i) Pay the amount withheld under paragraph (f)(1)(ii) of this clause to such first-tier subcontractor; or
  (ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under 41 U.S.C. 7109 in effect at the time the Contractor accrues the obligation to pay an interest penalty.
(g) Written notice of subcontractor withholding. The Contractor shall issue a written notice of any withholding to a subcontractor (with a copy furnished to the Contracting Officer), specifying-
   (1) The amount to be withheld;
   (2) The specific causes for the withholding under the terms of the subcontract; and
   (3) The remedial actions to be taken by the subcontractor in order to receive payment of the amounts withheld.

(h) Subcontractor payment entitlement. The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the payment of such amount.

(i) Prime-subcontractor disputes. A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the Government is a party. The Government may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

(j) Preservation of prime-subcontractor rights. Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.

(k) Non-recourse for prime contractor interest penalty. The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the Government for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

(l) Overpayments. If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall-
   (1) Remit the overpayment amount to the payment office cited in the contract along with a description of the overpayment including the-
      (i) Circumstances of the overpayment (e.g., duplicate payment, erroneous payment, liquidation errors, date(s) of overpayment);
      (ii) Affected contract number and delivery order number if applicable;
      (iii) Affected line item or subline item, if applicable; and
      (iv) Contractor point of contact.
   (2) Provide a copy of the remittance and supporting documentation to the Contracting Officer.

(End of clause)
agreeable method of payment; or
(ii) Request the Government to extend the payment due
date until such time as the Government can make payment by EFT (but see
paragraph (d) of this clause).

(b) Contractor's EFT information. The Government shall make payment
to the Contractor using the EFT information contained in the System for
Award Management (SAM) database. In the event that the EFT information
changes, the Contractor shall be responsible for providing the updated
information to the SAM database.

(c) Mechanisms for EFT payment. The Government may make payment by
EFT through either the Automated Clearing House (ACH) network, subject to
the rules of the National Automated Clearing House Association, or the
Fedwire Transfer System. The rules governing Federal payments through the
ACH are contained in 31 CFR part 210.

(d) Suspension of payment. If the Contractor's EFT information in the
SAM database is incorrect, then the Government need not make payment to the
Contractor under this contract until correct EFT information is entered
into the SAM database; and any invoice or contract financing request shall
be deemed not to be a proper invoice for the purpose of prompt payment
under this contract. The prompt payment terms of the contract regarding
notice of an improper invoice and delays in accrual of interest penalties
apply.

(e) Liability for uncompleted or erroneous transfers. (1) If an
uncompleted or erroneous transfer occurs because the Government used the
Contractor's EFT information incorrectly, the Government remains
responsible for-
(i) Making a correct payment;
(ii) Paying any prompt payment penalty due; and
(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the
Contractor's EFT information was incorrect, or was revised within 30 days
of Government release of the EFT payment transaction instruction to the
Federal Reserve System, and-

(i) If the funds are no longer under the control of the
payment office, the Government is deemed to have made payment and the
Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment
office, the Government shall not make payment, and the provisions of
paragraph (d) of this clause shall apply.

(f) EFT and prompt payment. A payment shall be deemed to have been
made in a timely manner in accordance with the prompt payment terms of this
contract if, in the EFT payment transaction instruction released to the
Federal Reserve System, the date specified for settlement of the payment is
on or before the prompt payment due date, provided the specified payment
date is a valid date under the rules of the Federal Reserve System.

(g) EFT and assignment of claims. If the Contractor assigns the
proceeds of this contract as provided for in the assignment of claims terms
of this contract, the Contractor shall require as a condition of any such
assignment, that the assignee shall register separately in the SAM database
and shall be paid by EFT in accordance with the terms of this clause.
Notwithstanding any other requirement of this contract, payment to an
ultimate recipient other than the Contractor, or a financial institution
properly recognized under an assignment of claims pursuant to Subpart 32.8,
is not permitted. In all respects, the requirements of this clause shall
apply to the assignee as if it were the Contractor. EFT information that
shows the ultimate recipient of the transfer to be other than the
Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(h) Liability for change of EFT information by financial agent. The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(i) Payment information. The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the SAM database.

(End of clause)

1.102 FAR 52.232-39 UNENFORCEABILITY OF UNAUTHORIZED OBLIGATIONS (JUN 2013)

(a) Except as stated in paragraph (b) of this clause, when any supply or service acquired under this contract is subject to any End User License Agreement (EULA), Terms of Service (TOS), or similar legal instrument or agreement, that includes any clause requiring the Government to indemnify the Contractor or any person or entity for damages, costs, fees, or any other loss or liability that would create an Anti-Deficiency Act violation (31 U.S.C. 1341), the following shall govern:

(1) Any such clause is unenforceable against the Government.
(2) Neither the Government nor any Government authorized end user shall be deemed to have agreed to such clause by virtue of it appearing in the EULA, TOS, or similar legal instrument or agreement. If the EULA, TOS, or similar legal instrument or agreement is invoked through an "I agree" click box or other comparable mechanism (e.g., "click-wrap" or "browse-wrap" agreements), execution does not bind the Government or any Government authorized end user to such clause.
(3) Any such clause is deemed to be stricken from the EULA, TOS, or similar legal instrument or agreement.

(b) Paragraph (a) of this clause does not apply to indemnification by the Government that is expressly authorized by statute and specifically authorized under applicable agency regulations and procedures.

(End of clause)

1.103 FAR 52.232-40 PROVIDING ACCELERATED PAYMENT TO SMALL BUSINESS SUBCONTRACTORS (DEC 2013)

(a) Upon receipt of accelerated payments from the Government, the Contractor shall make accelerated payments to its small business subcontractors under this contract, to the maximum extent practicable and prior to when such payment is otherwise required under the applicable contract or subcontract, after receipt of a proper invoice and all other required documentation from the small business subcontractor.

(b) The acceleration of payments under this clause does not provide any new rights under the Prompt Payment Act.
(c) Include the substance of this clause, including this paragraph (c), in all subcontracts with small business concerns, including subcontracts with small business concerns for the acquisition of commercial items.  
(End of clause)

1.104  *FAR 52.233-1   DISPUTES (MAY 2014)

(a) This contract is subject to 41 U.S.C. chapter 71, Contract Disputes.
(b) Except as provided in the 41 U.S.C. chapter 71, all disputes arising under or relating to this contract shall be resolved under this clause.
(c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding $100,000 is not a claim under 41 U.S.C. chapter 71 until certified. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under 41 U.S.C. chapter 71. The submission may be converted to a claim under 41 U.S.C. chapter 71, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2) (i) Contractors shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding $100,000.

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows:

'I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am authorized to certify the claim on behalf of the Contractor.'

(3) The certification may be executed by any person authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of $100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor certified claims over $100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in 41 U.S.C. chapter 71.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific
reasons for rejecting the offer.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified if required), or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6 month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer.

(End of clause)

1.105 *FAR 52.233-3      PROTEST AFTER AWARD (AUG 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to
this contract is sustained, and the Government pays costs, as provided in
FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor
to reimburse the Government the amount of such costs. In addition to any
other remedy available, and pursuant to the requirements of Subpart 32.6,
the Government may collect this debt by offsetting the amount against any
payment due the Contractor under any contract between the Contractor and
the Government.
(End of clause)

1.106 FAR 52.233-4 APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM (OCT 2004)
United States law will apply to resolve any claim of breach of this
contract.
(End of clause)

1.107 FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

   (a) The Contractor shall promptly, and before the conditions are
disturbed, give a written notice to the Contracting Officer of
   (1) subsurface or latent physical conditions at the site
which differ materially from those indicated in this contract, or
   (2) unknown physical conditions at the site, of an unusual
nature, which differ materially from those ordinarily encountered and
generally recognized as inhering in work of the character provided for in
the contract.

   (b) The Contracting Officer shall investigate the site conditions
promptly after receiving the notice. If the conditions do materially so
differ and cause an increase or decrease in the Contractor's cost of, or
the time required for, performing any part of the work under this contract,
whether or not changed as a result of the conditions, an equitable
adjustment shall be made under this clause and the contract modified in
writing accordingly.

   (c) No request by the Contractor for an equitable adjustment to the
contract under this clause shall be allowed, unless the Contractor has
given the written notice required, provided, that the time prescribed in
(a) above for giving written notice may be extended by the Contracting
Officer.

   (d) No request by the Contractor for an equitable adjustment to the
contract for differing site conditions shall be allowed if made after final
payment under this contract.
(End of clause)

1.108 *FAR 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE
WORK (APR 1984)

   (a) The Contractor acknowledges that it has taken steps reasonably
necessary to ascertain the nature and location of the work, and that it has
investigated and satisfied itself as to the general and local conditions
which can affect the work or its cost, including but not limited to
   (1) conditions bearing upon transportation, disposal,
handling, and storage of materials;
   (2) the availability of labor, water, electric power, and
roads;
   (3) uncertainties of weather, river stages, tides, or similar
physical conditions at the site;
   (4) the conformation and conditions of the ground; and
   (5) the character of equipment and facilities needed
preliminary to and during work performance. The Contractor also
acknowledges that it has satisfied itself as to the character, quality, and
quantity of surface and subsurface materials or obstacles to be encountered
insofar as this information is reasonably ascertainable from an inspection
of the site, including all exploratory work done by the Government, as well
as from the drawings and specifications made a part of this contract. Any
failure of the Contractor to take the actions described and acknowledged in
this paragraph will not relieve the Contractor from responsibility for
estimating properly the difficulty and cost of successfully performing the
work, or for proceeding to successfully perform the work without additional
expense to the Government.

(b) The Government assumes no responsibility for any conclusions or
interpretations made by the Contractor based on the information made
available by the Government. Nor does the Government assume responsibility
for any understanding reached or representation made concerning conditions
which can affect the work by any of its officers or agents before the
execution of this contract, unless that understanding or representation is
expressly stated in this contract.

(End of clause)

1.109 *FAR 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)

(a) All equipment, material, and articles incorporated into the
work covered by this contract shall be new and of the most suitable grade
for the purpose intended, unless otherwise specifically provided in this
contract. References in the specifications to equipment, material,
articles, or patented processes by trade name, make, or catalog number,
shall be regarded as establishing a standard of quality and shall not be
construed as limiting competition. The Contractor may, at its option, use
any equipment, material, article, or process that, in the judgment of the
Contracting Officer, is equal to that named in the specifications, unless
otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval
of the machinery and mechanical and other equipment to be incorporated into
the work. When requesting approval, the Contractor shall furnish to the
Contracting Officer the name of the manufacturer, the model number, and
other information concerning the performance, capacity, nature, and rating
of the machinery and mechanical and other equipment. When required by this
contract or by the Contracting Officer, the Contractor shall also obtain
the Contracting Officer's approval of the material or articles which the
Contractor contemplates incorporating into the work. When requesting
approval, the Contractor shall provide full information concerning the
material or articles. When directed to do so, the Contractor shall submit
samples for approval at the Contractor's expense, with all shipping charges
prepaid. Machinery, equipment, material, and articles that do not have the
required approval shall be installed or used at the risk of subsequent
rejection.

(c) All work under this contract shall be performed in a skillful
and workmanlike manner. The Contracting Officer may require, in writing,
that the Contractor remove from the work any employee the Contracting
Officer deems incompetent, careless, or otherwise objectionable.

(End of clause)

1.110 *FAR 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work
is completed and accepted, the Contractor shall directly superintend the
work or assign and have on the work site a competent superintendent who is
satisfactory to the Contracting Officer and has authority to act for the
Contractor.

(End of clause)
1.111 FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

   The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.  

   (End of clause)

1.112 *FAR 52.236-8 OTHER CONTRACTS (APR 1984)

   The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.  

   (End of clause)

1.113 *FAR 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

   (a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.  

   (b) The Contractor shall protect from damage all existing improvements and utilities

            (1) at or near the work site, and
            (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refused to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

   (End of clause)

1.114 FAR 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

   (a) The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
(b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

(End of clause)

1.115 *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

(End of clause)

1.116 *FAR 52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

(End of clause)

1.117 *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.
(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall--

1. Provide appropriate safety barricades, signs, and signal lights;
2. Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and
3. Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontractors.

(f) Before commencing the work, the Contractor shall--

1. Submit a written proposed plan for implementing this clause. The plan shall include an analysis of the significant hazards to life, limb, and property inherent in contract work performance and a plan for controlling these hazards; and
2. Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

(End of clause)

1.118 *FAR 52.236-14  AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

(End of clause)
1.119 FAR 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

(End of clause)

1.120 FAR 52.236-17 LAYOUT OF WORK (APR 1984)

The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

(End of clause)

1.121 FAR 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997) ALTERNATE I (APR 1984)

(a) The Contractor shall keep on the work site a copy of the
drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription," of the Contracting Officer is intended and similarly the words "approved," "acceptable," "satisfactory," or words of like import shall mean "approved by," or "acceptable to," or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed."

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail
   (1) the proposed fabrication and assembly of structural elements, and
   (2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for
approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor. Upon completing the work under this contract, the Contractor shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the equipment is completed and accepted.

(End of clause)

1.122 *FAR 52.236-25 REQUIREMENTS FOR REGISTRATION OF DESIGNERS (JUNE 2003)

Architects or engineers registered to practice in the particular professional field involved in a State, the District of Columbia, or an outlying area of the United States shall prepare or review and approve the design of architectural, structural, mechanical, electrical, civil, or other engineering features of the work.

(End of clause)

1.123 *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

(End of clause)

1.124 *FAR 52.242-5 PAYMENTS TO SMALL BUSINESS SUBCONTRACTORS (JAN 2017)

(a) Definitions. As used in this clause—
Reduced payment means a payment that is for less than the amount agreed upon in a subcontract in accordance with its terms and conditions, for supplies and services for which the Government has paid the prime contractor.
Untimely payment means a payment that is more than 90 days past due under the terms and conditions of a subcontract, for supplies and services for which the Government has paid the prime contractor.

(b) Notice. The Contractor shall notify the Contracting Officer, in writing, not later than 14 days after—
(1) A small business subcontractor was entitled to payment under the terms and conditions of the subcontract; and
(2) The Contractor—
   (i) Made a reduced or untimely payment to the small business subcontractor; or
   (ii) Failed to make a payment, which is now untimely.

(c) Content of notice. The Contractor shall include the reason(s) for making the reduced or untimely payment in any notice required under paragraph (b) of this clause.

(End of clause)

1.125 *FAR 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract,
written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

(End of clause)

1.126 *FAR 52.242-14   SUSPENSION OF WORK (APR 1984)

(a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the unreasonable suspension, delay, or interruption, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract.

(c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

(End of clause)

1.127 FAR 52.243-4   CHANGES (JUNE 2007)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

(1) in the specifications (including drawings and designs);
(2) in the method or manner of performance of the work;
(3) in the Government-furnished property or services; or
(4) directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating

(1) the date, circumstances, and source of the order and
(2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement, or
conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after

(1) receipt of a written change order under paragraph (a) of this clause or

(2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

(End of clause)

1.128 *FAR 52.244-2     SUBCONTRACTS (OCT 2010)

(a) Definitions. As used in this clause--

"Approved purchasing system" means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquisition Regulation (FAR).

"Consent of subcontract" means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

"Subcontract," means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or services for performance of the the prime contract or a subcontract. It includes, but is not limited to purchase orders, and changes and modifications to purchase orders.

(b) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modification or unpriced delivery orders), and only if required in accordance with paragraph (c) or (d) of this clause.

(c) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified threshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other than the Coast Guard and the National Aeronautics and Space Administration,
either the the simplified threshold or 5 percent of the total estimated cost of the contract.

(d) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

(e)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (b), (c), or (d) of this clause, including the following information:
   (i) A description of the supplies or services to be subcontracted.
   (ii) Identification of the type of subcontract to be used.
   (iii) Identification of the proposed subcontractor.
   (iv) The proposed subcontract price.
   (v) The subcontractor's current, complete, and accurate certified cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.
   (vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.
   (vii) A negotiation memorandum reflecting--
   (A) The principal elements of the subcontract price negotiations;
   (B) The most significant considerations controlling establishment of initial or revised prices;
   (C) The reason certified cost or pricing data were or were not required;
   (D) The extent, if any, to which the Contractor did not rely on the subcontractor's certified cost or pricing data in determining the price objective and in negotiating the final price;
   (E) The extent to which it was recognized in the negotiation that the subcontractor's certified cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and subcontractor; and the effect of any such defective data on the total price negotiated;
   (F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and
   (G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered.

(2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (b), (c), or (d) of this clause.

(f) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination--
   (1) Of the acceptability of any subcontract terms or conditions;
   (2) Of the acceptability of any cost under this contract; or
   (3) To relieve the Contractor of any responsibility for
performing this contract.

(g) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).

(h) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement by the Government.

(i) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(j) Paragraphs (c) and (e) of this clause do not apply to the following subcontracts, which are evaluated during negotiations:

______________________________________________________
______________________________________________________
______________________________________________________

(End of clause)

1.129 *FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (JAN 2017)

(a) Definitions. As used in this clause-

"Commercial item" and "commercially available off-the-shelf item" have the meanings contained in Federal Acquisition Regulation 2.101, Definitions.

"Subcontract" includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c)(1) The Contractor shall insert the following clauses in subcontracts for commercial items:

(i) 52.203-13, Contractor Code of Business Ethics and Conduct (OCT 2015) (41 U.S.C. 3509), if the subcontract exceeds $5.5 million and has a performance period of more than 120 days. In altering this clause to identify the appropriate parties, all disclosures of violation of the civil False Claims Act or of Federal criminal law shall be directed to the agency Office of the Inspector General, with a copy to the Contracting Officer.


(iii) 52.203-19, Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements (JAN 2017).

(iv) 52.204-21, Basic Safeguarding of Covered Contractor Information Systems (JUN 2016), other than subcontracts for commercially available off-the-shelf items, if flow down is required in accordance with paragraph (c) of FAR clause 52.204-21.

(v) 52.219-8, Utilization of Small Business Concerns (NOV 2016) (15 U.S.C. 637(d)(2) and (3)), if the subcontract offers further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds $700,000 ($1.5 million for construction of any public facility), the subcontractor must include 52.219-8 in lower tier
subcontracts that offer subcontracting opportunities.

(vi) 52.222-21, Prohibition of Segregated Facilities (Apr 2015).

(vii) 52.222-26, Equal Opportunity (SEPT 2016) (E.O. 11246).

(viii) 52.222-35, Equal Opportunity for Veterans (OCT 2015) (38 U.S.C. 4212(a));


(x) 52.222-37, Employment Reports on Veterans (FEB 2016) (38 U.S.C. 4212).

(xi) 52.222-40, Notification of Employee Rights Under the National Labor Relations Act (Dec 2010) (E.O. 13496), if flow down is required in accordance with paragraph (f) of FAR clause 52.222-40.


(B) Alternate I (MAR 2015) of 52.222-50 (22 U.S.C. chapter 78 and E.O. 13627).

(xiii) 52.222-55, Establishing a Minimum Wage for Contractors (E.O. 13658) (DEC 2015), if flowdown is required in accordance with paragraph (k) of FAR clause 52.222-55.

(xiv) 52.222-59, Compliance with Labor Laws (Executive Order 13673) (OCT 2016), if the estimated subcontract value exceeds $500,000, and is for other than commercially available off-the-shelf items.

**Note to paragraph 52.244-6(c)(1)(xiii):** By a court order issued on October 24, 2016, 52.222-59 is enjoined indefinitely as of the date of the order. The enjoined paragraph will become effective immediately if the court terminates the injunction. At that time, GSA, DoD and NASA will publish a document in the Federal Register advising the public of the termination of the injunction.

(xv) 52.222-60, Paycheck Transparency (Executive Order 13673) (OCT 2016), if the estimated subcontract value exceeds $500,000, and is for other than commercially available off-the-shelf items.

(xvi) 52.222-62, Paid Sick Leave Under Executive Order 13706 (JAN 2017) (E.O. 13706), if flowdown is required in accordance with paragraph (m) of FAR clause 52.222-62.

(xvii) (A) 52.224-3, Privacy Training (JAN 2017) (5 U.S.C. 552a) if flow down is required in accordance with 52.224-3(f).

(B) Alternate I (JAN 2017) of 52.224-3, if flow down is required in accordance with 52.224-3(f) and the agency specifies that only its agency-provided training is acceptable).


(xix) 52.232-40, Providing Accelerated Payments to Small Business Subcontractors (DEC 2013), if flow down is required in accordance with paragraph (c) of FAR clause 52.232-40.

(xx) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Feb 2006) (46 U.S.C. App. 1241 and 10 U.S.C. 2631), if flow down is required in accordance with paragraph (d) of FAR clause 52.247-64).

(2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

(End of clause)
1.130  *FAR 52.246-12  INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--
   (1) Relieve the Contractor of responsibility for providing adequate quality control measures;
   (2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;
   (3) Constitute or imply acceptance; or
   (4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) below.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may
   (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or
   (2) Terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection,
all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

(End of clause)

1.131 *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government owned or controlled real or personal property, when that damage is the result of

1. The Contractor's failure to conform to contract requirements; or
2. Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall

1. Obtain all warranties that would be given in normal commercial practice;
2. Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and
3. Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government furnished material or design.
(j) This warranty shall not limit the Government’s rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

(End of clause)

1.132 *FAR 52.248-3 VALUE ENGINEERING--CONSTRUCTION (OCT 2015)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP’s) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP’s, in accordance with paragraph (f) of this clause.

(b) Definitions. “Collateral costs,” as used in this clause, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

“Collateral savings,” as used in this clause, means those measurable net reductions resulting from a VECP in the agency’s overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

“Contractor’s development and implementation costs,” as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

“Government costs,” as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

“Instant contract savings,” as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor’s development and implementation costs, including subcontractors’ development and implementation costs (see paragraph (h) of this clause).

“Value engineering change proposal (VECP)” means a proposal that—

(1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change—

(i) In deliverable end item quantities only; or

(ii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in paragraphs (c)(1) through (7) of this clause. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:
(1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item’s function or characteristics are being altered, and the effect of the change on the end item’s performance.

(2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

(3) A separate, detailed cost estimate for (i) the affected portions of the existing contract requirement and (ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor’s allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (h) of this clause.

(4) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(5) A prediction of any effects the proposed change would have on collateral costs to the agency.

(6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submission. The Contractor shall submit VECP’s to the Resident Engineer at the worksite, with a copy to the Contracting Officer.

(e) Government action.

(1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP’s expeditiously; however, it will not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(3) Any VECP may be accepted, in whole or in part, by the Contracting Officer’s award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applies a VECP to this contract, the
Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing—

(1) Rates. The Government’s share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by—

(i) 45 percent for fixed-price contracts; or

(ii) 75 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to—

(i) Accept the VECP;

(ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and

(iii) Provide the Contractor’s share of savings by adding the amount calculated to the contract price or fee.

(g) Collateral savings. If a VECP is accepted, the Contracting Officer will increase the instant contract amount by 20 percent of any projected collateral savings determined to be realized in a typical year of use after subtracting any Government costs not previously offset. However, the Contractor’s share of collateral savings will not exceed the contract’s firm-fixed-price or estimated cost, at the time the VECP is accepted, or $100,000, whichever is greater. The Contracting Officer is the sole determiner of the amount of collateral savings.

(h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of $70,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract’s price under paragraph (f) of this clause, the Contractor’s allowable development and implementation costs shall include any subcontractor’s allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government’s share of the savings resulting from the VECP.

(i) Data. The Contractor may restrict the Government’s right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

These data, furnished under the Value Engineering—Construction clause of contract __________, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government’s right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations.
If a VECP is accepted, the Contractor hereby grants the Government
unlimited rights in the VECP and supporting data, except that, with respect
to data qualifying and submitted as limited rights technical data, the
Government shall have the rights specified in the contract modification
implementing the VECP and shall appropriately mark the data. (The terms
“unlimited rights” and “limited rights” are defined in Part 27 of the
Federal Acquisition Regulation.)

(End of clause)

1.133 *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT
(FIXED-PRICE) (APR 2012) ALTERNATE I (SEP 1996)

(a) The Government may terminate performance of work under this
contract in whole or, from time to time, in part if the Contracting Officer
determines that a termination is in the Government's interest. The
Contracting Officer shall terminate by delivering to the Contractor a
Notice of Termination specifying the extent of termination and the
effective date.

(b) After receipt of a Notice of Termination, and except as
directed by the Contracting Officer, the Contractor shall immediately
proceed with the following obligations, regardless of any delay in
determining or adjusting any amounts due under this clause:

1. Stop work as specified in the notice.
2. Place no further subcontracts or orders (referred to as
subcontracts in this clause) for materials, services, or facilities, except
as necessary to complete the continued portion of the contract.
3. Terminate all subcontracts to the extent they relate to
the work terminated.
4. Assign to the Government, as directed by the Contracting
Officer, all right, title, and interest of the Contractor under the
subcontracts terminated, in which case the Government shall have the right
to settle or to pay any termination settlement proposal arising out of
those terminations.
5. With approval or ratification to the extent required by
the Contracting Officer, settle all outstanding liabilities and termination
settlement proposals arising from the termination of subcontracts; the
approval or ratification will be final for purposes of this clause.
6. As directed by the Contracting Officer, transfer title
and deliver to the Government
(i) the fabricated or unfabricated parts, work in process, completed
work, supplies, and other material produced or acquired for the work
terminated, and
(ii) the completed or partially completed plans, drawings, information,
and other property that, if the contract had been completed, would be
required to be furnished to the Government.
7. Complete performance of the work not terminated.
8. Take any action that may be necessary, or that the
Contracting Officer may direct, for the protection and preservation of the
property related to this contract that is in the possession of the
Contractor and in which the Government has or may acquire an interest.
9. Use its best efforts to sell, as directed or authorized
by the Contracting Officer, any property of the types referred to in
subparagraph (b) (6) of this clause; provided, however, that the Contractor
(i) is not required to extend credit to any purchaser
and
(ii) may acquire the property under the conditions
prescribed by, and at prices approved by, the Contracting Officer. The
proceeds of any transfer or disposition will be applied to reduce any
payments to be made by the Government under this contract, credited to the
price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120 day period.

(d) After expiration of the plant clearance period as defined in Subpart 49.001 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1 year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (f) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended, and the Contractor paid the agreed amount. Paragraph (f) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and the Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of the termination, the total (without duplication of any items) of--
   (i) The cost of this work;
   (ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and
   (iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.
The reasonable costs of settlement of the work terminated, including--

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of this clause, the fair value, as determined by the Contracting Officer, for the loss of the Government property.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m) (1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the
terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

(End of clause)

1.134 *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if-

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

   (i) acts of God or of the public enemy,
   (ii) acts of the Government in either its sovereign or contractual capacity,
   (iii) acts of another Contractor in the performance of a contract with the Government,
   (iv) fires,
   (v) floods,
   (vi) epidemics,
   (vii) quarantine restrictions,
   (viii) strikes,
   (ix) freight embargoes,
   (x) unusually severe weather, or
   (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Government.

(d) The rights and remedies of the Government in this clause are in
addition to any other rights and remedies provided by law or under this contract.
(End of clause)

1.135  UAI 5152.249-9000  BASIS FOR SETTLEMENT OF PROPOSALS (MAR 2009)

Actual costs will be used to determine equipment cost for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a termination settlement proposal using the total cost basis, the following principles will be applied to determine allowable equipment costs:

(a) Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting records to determine total actual equipment costs.

(b) If equipment costs have been allocated to a contract using predetermined rates, those charges will be adjusted to actual costs.

(c) Recorded job costs adjusted for unallowable and unallocable expenses will be used to determine equipment operating expenses.

(d) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(e) License, taxes, storage and insurance costs are normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recovered through the indirect expense rate.
(End of clause)

1.136  FAR 52.252-1  SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://acquisition.gov/comp/far/index.html
http://www.acq.osd.mil/dpap/
(End of provision)

1.137  FAR 52.252-2  CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://acquisition.gov/comp/far/index.html
http://www.acq.osd.mil/dpap/
(End of clause)
1.138 FAR 52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any DFARS (48 CFR Chapter 2) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

1.139 DFARS 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) Definition.
"Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

1.140 DFARS 252.203-7000 REQUIREMENTS RELATING TO COMPENSATION OF FORMER DOD OFFICIALS (SEP 2011)

(a) Definition. "Covered DoD official," as used in this clause, means an individual that-

(1) Leaves or left DoD service on or after January 28, 2008; and
(2)(i) Participated personally and substantially in an acquisition as defined in 41 U.S.C. 131 with a value in excess of $10 million, and serves or served-

(A) In an Executive Schedule position under subchapter II of chapter 53 of Title 5, United States Code;
(B) In a position in the Senior Executive Service under subchapter VIII of chapter 53 of Title 5, United States Code; or
(C) In a general or flag officer position compensated at a rate of pay for grade O-7 or above under section 201 of Title 37, United States Code; or

(ii) Serves or served in DoD in one of the following positions: program manager, deputy program manager, procuring contracting officer, administrative contracting officer, source selection authority, member of the source selection evaluation board, or chief of a financial or technical evaluation team for a contract in an amount in excess of $10 million.

(b) The Contractor shall not knowingly provide compensation to a covered DoD official within 2 years after the official leaves DoD service, without first determining that the official has sought and received, or has not received after 30 days of seeking, a written opinion from the appropriate DoD ethics counselor regarding the applicability of post-employment restrictions to the activities that the official is expected to undertake on behalf of the Contractor.

(c) Failure by the Contractor to comply with paragraph (b) of this clause may subject the Contractor to rescission of this contract, suspension, or debarment in accordance with 41 U.S.C. 2105(c).
1.141 DFARS 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE-CONTRACT-RELATED FELONIES (DEC 2008)

(a) Definitions.

As used in this clause--

(1) "Arising out of a contract with the "DoD" means any act in connection with--

   (i) Attempting to obtain;

   (ii) Obtaining; or

   (iii) Performing a contract or first-tier subcontract of any agency, department, or component of the Department of Defense (DoD).

(2) "Conviction of fraud or any other felony," means any conviction for fraud or a felony in violation of state or Federal criminal statutes, whether entered on a verdict or plea, including a plea of nolo contendere, for which sentence has been imposed.

(3) "Date of conviction," means the date judgment was entered against the individual.

(b) Any individual who is convicted after September 29, 1988 of fraud or any other felony arising out of a contract with the DoD is prohibited from serving--

   (1) In a management or supervisory capacity on this contract;

   (2) On the board of directors of the Contractor;

   (3) As a consultant, agent, or representative for the Contractor; or

   (4) In any other capacity with the authority to influence, advise, or control the decisions of the Contractor with regard to this contract.

(c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than 5 years from the date of conviction.

(d) 10 U.S.C. 2408 provides that the Contractor shall be subject to a criminal penalty of not more than $500,000 if convicted of knowingly--

   (1) Employing a person under a prohibition specified in paragraph (b) of this clause; or

   (2) Allowing such a person to serve on the board of directors of Contractor or first-tier subcontractor.

(e) In addition to the criminal penalties contained in 10 U.S.C. 2408, the Government may consider other available remedies, such as--

   (1) Suspension or debarment;

   (2) Cancellation of the contract at no cost to the Government; or

   (3) Termination of the contract for default.

(f) The Contractor may submit written requests for waiver of the prohibition in paragraph (b) of this clause to the Contracting Officer. Requests shall clearly identify--

   (1) The person involved;

   (2) The nature of the conviction and resultant sentence or punishment imposed;

   (3) The reasons for the requested waiver; and

   (4) An explanation of why a waiver is in the interest of national security.

(g) The Contractor agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all first-tier subcontracts exceeding the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation, except those for commercial items or components.
(h) Pursuant to 10 U.S.C. 2408(c), defense contractors and subcontractors may obtain information as to whether a particular person has been convicted of fraud or any other felony arising out of a contract with the DoD by contacting The Office of Justice Programs, The Denial of Federal Benefits Office, U.S. Department of Justice, telephone (301) 937-1542; www.ojp.usdoj.gov/BJA/grant/DPFC.html.

(End of clause)

1.142 DFARS 252.203-7002 REQUIREMENT TO INFORM EMPLOYEES OF WHISTLEBLOWER RIGHTS (SEP 2013)

(a) The Contractor shall inform its employees in writing, in the predominant native language of the workforce, of contractor employee whistleblower rights and protections under 10 U.S.C. 2409, as described in subpart 203.9 of the Defense Federal Acquisition Regulation Supplement.

(b) The Contractor shall include the substance of this clause, including this paragraph (b), in all subcontracts.

(End of clause)

1.143 DFARS 252.203-7003 AGENCY OFFICE OF THE INSPECTOR GENERAL (DEC 2012) -

The agency office of the Inspector General referenced in paragraphs (c) and (d) of FAR clause 52.203-13, Contractor Code of Business Ethics and Conduct, is the DoD Office of the Inspector General at the following address:


(End of clause)

1.144 DFARS 252.203-7004 DISPLAY OF FRAUD HOTLINE POSTER(S) (OCT 2016)

(a) Definition. "United States," as used in this clause, means the 50 States, the District of Columbia, and outlying areas.

(b) Display of fraud hotline poster(s).

(i) The Contractor shall display prominently the DoD fraud, waste, and abuse hotline poster prepared by the DoD Office of the Inspector General, in effect at time of contract award, in common work areas within business segments performing work under Department of Defense (DoD) contracts.

(ii) For contracts performed outside the United States, when security concerns can be appropriately demonstrated, the contracting officer may provide the contractor the option to publicize the program to contractor personnel in a manner other than public display of the poster, such as private employee written instructions and briefings.

(2) If the contract is funded, in whole or in part, by Department of Homeland Security (DHS) disaster relief funds and the work is to be performed in the United States, the DHS fraud hotline poster shall be displayed in addition to the DoD hotline poster. If a display of a DHS fraud hotline poster is required, the Contractor may obtain such poster from--
(i) DHS Office of Inspector General/MAIL STOP 0305, Attn: Office of Investigations--Hotline, 245 Murray Lane SW., Washington, DC 20528-0305; or

(ii) Via the Internet at https://www.oig.dhs.gov/assets/Hotline/DHS_OIG_Hotline-optimized.jpg.

(c)(1) The DoD hotline poster may be obtained from: Defense Hotline, The Pentagon, Washington, DC 20301-1900, or is also available via the internet at http://www.dodig.mil/hotline/hotline_posters.htm.

(2) If a significant portion of the employee workforce does not speak English, then the poster is to be displayed in the foreign languages that a significant portion of the employees speak.

(3) Additionally, if the Contractor maintains a company Web site as a method of providing information to employees, the Contractor shall display an electronic version of the the required poster at the website.

(d) Subcontracts. The Contractor shall include the substance of this clause, including this paragraph (d), in all subcontracts that exceed $5.5 million except when the subcontract is for the acquisition of a commercial item.

(End of clause)

1.145 DFARS 252.204-7000 DISCLOSURE OF INFORMATION (OCT 2016)

(a) The Contractor shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract, unless-

(1) The Contracting Officer has given prior written approval;

(2) The information is otherwise in the public domain before the date of release; or

(3) The information results from or arises during the performance of a project that involves no covered defense information (as defined in the clause at DFARS 252.204-7012, Safeguarding Covered Defense Information and Cyber Incident Reporting) and has been scoped and negotiated by the contracting activity with the contractor and research performer and determined in writing by the contracting officer to be fundamental research (which by definition cannot involve any covered defense information), in accordance with National Security Decision Directive 189, National Policy on the Transfer of Scientific, Technical and Engineering Information, in effect on the date of contract award and the Under Secretary of Defense (Acquisition, Technology, and Logistics) memoranda on Fundamental Research, dated May 24, 2010, and on Contracted Fundamental Research, dated June 26, 2008 (available at DFARS PGI 204.4).

(b) Requests for approval under paragraph (a) (1) shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 10 business days before the proposed date for release.
(c) The Contractor agrees to include a similar requirement, including this paragraph (c), in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

(End of clause)

1.146 DFARS 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT
(APR 1992)

The Contractor's procedures for protecting against unauthorized disclosure of information shall not require Department of Defense employees or members of the Armed Forces to relinquish control of their work products, whether classified or not, to the Contractor.

(End of clause)

1.147 DFARS 252.204-7004 ALTERNATE A, SYSTEM FOR AWARD MANAGMENT (FEB 2014)

As prescribed in 204.1105, substitute the following paragraph (a) for paragraph (a) of the provision at FAR 52.204-7:

(a) Definitions. As used in this provision--

"System for Award Management (SAM) database" means the primary Government repository for contractor information required for the conduct of business with the Government.

"Commercial and Government Entity (CAGE) code" means-

(1) A code assigned by the Defense Logistics Information Service (DLIS) to identify a commercial or Government entity; or

(2) A code assigned by a member of the North Atlantic Treaty Organization that DLIS records and maintains in the CAGE master file. This type of code is known as an "NCAGE code."

"Data Universal Numbering System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet, Inc. (D&B) to identify unique business entities.

"Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by D&B plus a 4-character suffix that may be assigned by a business concern. (D&B has no affiliation with this 4-character suffix.) This 4-character suffix may be assigned at the discretion of the business concern to establish additional SAM records for identifying alternative Electronic Funds Transfer (EFT) accounts (see Subpart 32.11 of the Federal Acquisition Regulation) for the same parent concern.

"Registered in the System for Award Management (SAM) database" means that-

(1) The contractor has entered all mandatory information, including the DUNS number or the DUNS+4 number, and Contractor and Government Entity (CAGE) code into the SAM database;

(2) The contractor has completed the Core Data, Assertions, Representations and Certifications, and Points of Contact sections of the registration in the SAM database;

(3) The Government has validated all mandatory data fields, to include validation of the Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS). The Contractor will be required to provide consent for TIN validation to the Government as part of the SAM registration process; and

(4) The Government has marked the records "Active."

(End of clause)
1.148 DFARS 252.204-7012 SAFEGUARDING COVERED DEFENSE INFORMATION AND CYBER INCIDENT REPORTING (OCT 2016)

(a) Definitions. As used in this clause—

"Adequate security" means protective measures that are commensurate with the consequences and probability of loss, misuse, or unauthorized access to, or modification of information.

"Compromise" means disclosure of information to unauthorized persons, or a violation of the security policy of a system, in which unauthorized intentional or unintentional disclosure, modification, destruction, or loss of an object, or the copying of information to unauthorized media may have occurred.

"Contractor attributional/proprietary information" means information that identifies the contractor(s), whether directly or indirectly, by the grouping of information that can be traced back to the contractor(s) (e.g., program description, facility locations), personally identifiable information, as well as trade secrets, commercial or financial information, or other commercially sensitive information that is not customarily shared outside of the company.

"Controlled technical information" means technical information with military or space application that is subject to controls on the access, use, reproduction, modification, performance, display, release, disclosure, or dissemination. Controlled technical information would meet the criteria, if disseminated, for distribution statements B through F using the criteria set forth in DoD Instruction 5230.24, Distribution Statements on Technical Documents. The term does not include information that is lawfully publicly available without restrictions.

"Covered contractor information system" means an unclassified information system that is owned, or operated by or for, a contractor and that processes, stores, or transmits covered defense information.

"Covered defense information" means unclassified controlled technical information or other information, as described in the Controlled Unclassified Information (CUI) Registry at http://www.archives.gov/cui/registry/category-list.html, that requires safeguarding or dissemination controls pursuant to and consistent with law, regulations, and Governmentwide policies, and is--

(1) Marked or otherwise identified in the contract, task order, or delivery order and provided to the contractor by or on behalf of DoD in support of the performance of the contract; or

(2) Collected, developed, received, transmitted, used, or stored by or on behalf of the contractor in support of the performance of the contract.

"Cyber incident" means actions taken through the use of computer networks that result in a compromise or an actual or potentially adverse effect on an information system and/or the information residing therein.

"Forensic analysis" means the practice of gathering, retaining, and analyzing computer-related data for investigative purposes in a manner that maintains the integrity of the data.
"Information system" means a discrete set of information resources organized for the collection, processing, maintenance, use, sharing, dissemination, or disposition of information.

"Malicious software" means computer software or firmware intended to perform an unauthorized process that will have adverse impact on the confidentiality, integrity, or availability of an information system. This definition includes a virus, worm, Trojan horse, or other code-based entity that infects a host, as well as spyware and some forms of adware.

"Media" means physical devices or writing surfaces including, but is not limited to, magnetic tapes, optical disks, magnetic disks, large-scale integration memory chips, and printouts onto which covered defense information is recorded, stored, or printed within within a covered contractor information system.

"Operationally critical support" means supplies or services designated by the Government as critical for airlift, sealift, intermodal transportation services, or logistical support that is essential to the mobilization, deployment, or sustainment of the Armed Forces in a contingency operation.

"Rapidly report" means within 72 hours of discovery of any cyber incident.

"Technical information" means technical data or computer software, as those terms are defined in the clause at DFARS 252.227-7013, Rights in Technical Data-Noncommercial Items, regardless of whether or not the clause is incorporated in this solicitation or contract. Examples of technical information include research and engineering data, engineering drawings, and associated lists, specifications, standards, process sheets, manuals, technical reports, technical orders, catalog-item identifications, data sets, studies and analyses and related information, and computer software executable code and source code.

(b) Adequate security. The Contractor shall provide adequate security on all covered contractor information systems. To provide adequate security, the Contractor shall implement, at a minimum, the following information security protections:

(1) For covered contractor information systems that are part of an information technology (IT) service or system operated on behalf of the Government, the following security requirements apply:

(i) Cloud computing services shall be subject to the security requirements specified in the clause 252.239-7010, Cloud Computing Services, of this contract.

(ii) Any other such IT service or system (i.e., other than cloud computing) shall be subject to the security requirements specified elsewhere in this contract.

(2) For covered contractor information systems that are not part of an IT service or system operated on behalf of the Government and therefore are not subject to the security requirement specified at paragraph (b)(1) of this clause, the following security requirements apply:

(i) Except as provided in paragraph (b)(2)(ii) of this clause, the covered contractor information system shall be subject to the security requirements in National Institute of Standards and Technology (NIST) Special Publication (SP) 800-171, ✔Protecting Controlled Unclassified Information
in Nonfederal Information Systems and Organizations'' (available via the internet at http://dx.doi.org/10.6028/NIST.SP.800-171) in effect at the time the solicitation is issued or as authorized by the Contracting Officer.

(ii)(A) The Contractor shall implement NIST SP 800-171, as soon as practical, but not later than December 31, 2017. For all contracts awarded prior to October 1, 2017, the Contractor shall notify the DoD Chief Information Officer (CIO), via email at osd.dibcsia@mail.mil, within 30 days of contract award, of any security requirements specified by NIST SP 800-171 not implemented at the time of contract award.

(B) The Contractor shall submit requests to vary from NIST SP 800-171 in writing to the Contracting Officer, for consideration by the DoD CIO. The Contractor need not implement any security requirement adjudicated by an authorized representative of the DoD CIO to be nonapplicable or to have an alternative, but equally effective, security measure that may be implemented in its place.

(C) If the DoD CIO has previously adjudicated the contractor's requests indicating that a requirement is not applicable or that an alternative security measure is equally effective, a copy of that approval shall be provided to the Contracting Officer when requesting its recognition under this contract.

(D) If the Contractor intends to use an external cloud service provider to store, process, or transmit any covered defense information in performance of this contract, the Contractor shall require and ensure that the cloud service provider meets security requirements equivalent to those established by the Government for the Federal Risk and Authorization Management Program (FedRAMP) Moderate baseline (https://www.fedramp.gov/resources/documents/) and that the cloud service provider complies with requirements in paragraphs (c) through (g) of this clause for cyber incident reporting, malicious software, media preservation and protection, access to additional information and equipment necessary for forensic analysis, and cyber incident damage assessment.

(3) Apply other information systems security measures when the Contractor reasonably determines that information systems security measures, in addition to those identified in paragraphs (b)(1) and (2) of this clause, may be required to provide adequate security in a dynamic environment or to accommodate special circumstances (e.g., medical devices) and any individual, isolated, or temporary deficiencies based on an assessed risk or vulnerability. These measures may be addressed in a system security plan.

(c) Cyber incident reporting requirement.

(1) When the Contractor discovers a cyber incident that affects a covered contractor information system or the covered defense information residing therein, or that affects the contractor’s ability to perform the requirements of the contract that are designated as operationally critical support and identified in the contract, the Contractor shall—

(i) Conduct a review for evidence of compromise of covered defense information, including, but not limited to, identifying compromised computers, servers, specific data, and user accounts. This review shall also include analyzing covered contractor information system(s) that were part of the cyber incident, as well as other information systems on the Contractor’s network(s), that may have been accessed as a result of the
incident in order to identify compromised covered defense information, or that affect the Contractor’s ability to provide operationally critical support; and

(ii) Rapidly report cyber incidents to DoD at http://dibnet.dod.mil.

(2) Cyber incident report. The cyber incident report shall be treated as information created by or for DoD and shall include, at a minimum, the required elements at http://dibnet.dod.mil.

(3) Medium assurance certificate requirement. In order to report cyber incidents in accordance with this clause, the Contractor or subcontractor shall have or acquire a DoD-approved medium assurance certificate to report cyber incidents. For information on obtaining a DoD-approved medium assurance certificate, see http://iase.disa.mil/pki/eca/Pages/index.aspx.

(d) Malicious software. When the Contractor or subcontractors discover and isolate malicious software in connection with a reported cyber incident, submit the malicious software to DoD Cyber Crime Center (DC3) in accordance with instructions provided by DC3 or the Contracting Officer. Do not send the malicious software to the Contracting Officer.

(e) Media preservation and protection. When a Contractor discovers a cyber incident has occurred, the Contractor shall preserve and protect images of all known affected information systems identified in paragraph (c)(1)(i) of this clause and all relevant monitoring/packet capture data for at least 90 days from the submission of the cyber incident report to allow DoD to request the media or decline interest.

(f) Access to additional information or equipment necessary for forensic analysis. Upon request by DoD, the Contractor shall provide DoD with access to additional information or equipment that is necessary to conduct a forensic analysis.

(g) Cyber incident damage assessment activities. If DoD elects to conduct a damage assessment, the Contracting Officer will request that the Contractor provide all of the damage assessment information gathered in accordance with paragraph (e) of this clause.

(h) DoD safeguarding and use of contractor attributional/proprietary information. The Government shall protect against the unauthorized use or release of information obtained from the contractor (or derived from information obtained from the contractor) under this clause that includes contractor attributional/proprietary information, including such information submitted in accordance with paragraph (c). To the maximum extent practicable, the Contractor shall identify and mark attributional/proprietary information. In making an authorized release of such information, the Government will implement appropriate procedures to minimize the contractor attributional/proprietary information that is included in such authorized release, seeking to include only that information that is necessary for the authorized purpose(s) for which the information is being released.

(i) Use and release of contractor attributional/proprietary information not created by or for DoD. Information that is obtained from the contractor (or derived from information obtained from the contractor) under this clause that is not created by or for DoD is authorized to be released outside of DoD—
(1) To entities with missions that may be affected by such information;

(2) To entities that may be called upon to assist in the diagnosis, detection, or mitigation of cyber incidents;

(3) To Government entities that conduct counterintelligence or law enforcement investigations;

(4) For national security purposes, including cyber situational awareness and defense purposes (including with Defense Industrial Base (DIB) participants in the program at 32 CFR part 236); or

(5) To a support services contractor ("recipient") that is directly supporting Government activities under a contract that includes the clause at 252.204-7009, Limitations on the Use or Disclosure of Third-Party Contractor Reported Cyber Incident Information.

(j) Use and release of contractor attributional/proprietary information created by or for DoD. Information that is obtained from the contractor (or derived from information obtained from the contractor) under this clause that is created by or for DoD (including the information submitted pursuant to paragraph (c) of this clause) is authorized to be used and released outside of DoD for purposes and activities authorized by paragraph (i) of this clause, and for any other lawful Government purpose or activity, subject to all applicable statutory, regulatory, and policy based restrictions on the Government’s use and release of such information.

(k) The Contractor shall conduct activities under this clause in accordance with applicable laws and regulations on the interception, monitoring, access, use, and disclosure of electronic communications and data.

(l) Other safeguarding or reporting requirements. The safeguarding and cyber incident reporting required by this clause in no way abrogates the Contractor’s responsibility for other safeguarding or cyber incident reporting pertaining to its unclassified information systems as required by other applicable clauses of this contract, or as a result of other applicable U.S. Government statutory or regulatory requirements.

(m) Subcontracts. The Contractor shall--

(1) Include this clause, including this paragraph (m), in subcontracts, or similar contractual instruments, for operationally critical support, or for which subcontract performance will involve covered defense information, including subcontracts for commercial items, without alteration, except to identify the parties. The Contractor shall determine if the information required for subcontractor performance retains its identity as covered defense information and will require protection under this clause, and, if necessary, consult with the Contracting Officer; and

(2) Require subcontractors to--

(i) Notify the prime Contractor (or next higher-tier subcontractor) when submitting a request to vary from a NIST SP 800-171 security requirement to the Contracting Officer, in accordance with paragraph (b)(2)(ii)(B) of this clause; and
(ii) Provide the incident report number, automatically assigned by DoD, to the prime Contractor (or next higher-tier subcontractor) as soon as practicable, when reporting a cyber incident to DoD as required in paragraph (c) of this clause.

(End of clause)

1.149 DFARS 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A COUNTRY THAT IS A STATE SPONSOR OF TERRORISM (DEC 2014)

(a) Unless the Government determines that there is a compelling reason to do so, the Contractor shall not enter into any subcontract in excess of $30,000 with a firm, or a subsidiary of a firm, that is identified in the Exclusions section of the System for Award Management (SAM Exclusions) as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a country that is a state sponsor of terrorism.

(b) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is identified, in SAM Exclusions, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a country that is a state sponsor of terrorism. The notice must include the name of the proposed subcontractor and the compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion in SAM Exclusions.

(End of Clause)

1.150 DFARS 252.215-7000 PRICING ADJUSTMENTS (DEC 2012)

The term "pricing adjustment," as used in paragraph (a) of the clauses entitled "Price Reduction for Defective Cost or Certified Pricing Data--Modifications," "Subcontractor Certified Cost or Pricing Data," and "Subcontractor Certified Cost or Pricing Data--Modifications," means the aggregate increases and/or decreases in cost plus applicable profits.

(End of clause)

1.151 RESERVED

1.152 DFARS 252.219-7003 SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) - BASIC (DEVIATION 2016-00009) (AUG 2016)

This clause supplements the Federal Acquisition Regulation 52.219-9, Small Business Subcontracting Plan, clause of this contract.

(a) Definitions. Summary Subcontract Report (SSR) Coordinator," as used in this clause, means the individual at the department or agency level who is registered in the Electronic Subcontracting Reporting System (eSRS) at the Department of Defense (9700) and is responsible for acknowledging receipt or rejecting SSRs in eSRS for the Department of Defense.

(b) Subcontracts awarded to workshops approved by the Committee for Purchase from People Who are Blind or Severely Disabled (41 U.S.C. 8502-8504), may be counted toward the Contractor's small business subcontracting goal.

(c) A mentor firm, under the Pilot Mentor-Protege Program established under Section 831 of Public Law 101-510, as amended, may count toward its small disadvantaged business goal, subcontracts awarded to-
(1) Protege firms which are qualified organizations employing the severely disabled; and
(2) Former protege firms that meet the criteria in Section 831(g)(4) of Public Law 101-510.

(d) The master plan approval is approved by the Contractor's cognizant contract administration activity.

(e) In those subcontracting plans which specifically identify small businesses, the Contractor shall notify the Administrative Contracting Officer of any substitutions of firms that are not small business firms, for the small business firms specifically identified in the subcontracting plan. Notifications shall be in writing and shall occur within a reasonable period of time after award of the subcontract. Contractor-specified formats shall be acceptable.

(f) (1) For DoD, the Contractor shall submit reports in esRS as follows:
   (i) The Individual Subcontract Report (ISR) shall be submitted to the contracting officer at the procuring contracting office, even when contract administration has been delegated to the Defense Contract Management Agency.
   (ii) To submit the consolidated SSR for an individual subcontracting plan in esRS, the contractor shall identify the Government agency in Block 7 ("Agency to which the report is being submitted") by selecting "Department of Defense (DoD) (9700)" from the top of the second dropdown menu. The contractor shall not select anything lower.
(2) For DoD, the authority to acknowledge receipt or reject reports in esRS is as follows:
   (i) The authority to acknowledge receipt or reject the ISR resides with the contracting officer who receives it, as described in paragraph (f)(1)(i) of this clause.
   (ii) The authority to acknowledge receipt or reject SSRs resides with the SSR Coordinator.

(End of clause)

1.153 RESERVED

1.154 RESERVED

1.155 RESERVED

1.156 RESERVED

1.157 DFARS 252.222-7006 RESTRICTIONS ON THE USE OF MANDATORY ARBITRATION AGREEMENTS (DEC 2010)

(a) Definitions. As used in this clause-

"Covered subcontractor" means any entity that has a subcontract valued in excess of $1 million, except a subcontract for the acquisition of commercial items, including commercially available off-the-shelf items.
"Subcontract" means any contract, as defined in Federal Acquisition Regulation subpart 2.1, to furnish supplies or services for performance of this contract or a higher-tier subcontract thereunder.

(b) The Contractor-
   (1) Agrees not to-
      (i) Enter into any agreement with any of its employees or independent contractors that requires, as a condition of employment, that the employee or independent contractor agree to resolve through arbitration-
         (A) Any claim under title VII of the Civil Rights Act of 1964; or
         (B) Any tort related to or arising out of sexual assault or harassment, including assault and battery, intentional infliction of emotional distress, false imprisonment, or negligent hiring, supervision, or retention; or
      (ii) Take any action to enforce any provision of an existing agreement with an employee or independent contractor that mandates that the employee or independent contractor resolve through arbitration-
         (A) Any claim under title VII of the Civil Rights Act of 1964; or
         (B) Any tort related to or arising out of sexual assault or harassment, including assault and battery, intentional infliction of emotional distress, false imprisonment, or negligent hiring, supervision, or retention; and
   (2) Certifies, by signature of the contract, that it requires each covered subcontractor to agree not to enter into, and not to take any action to enforce, any provision of any existing agreements, as described in paragraph (b)(1) of this clause, with respect to any employee or independent contractor performing work related to such subcontract.

(c) The prohibitions of this clause do not apply with respect to a contractor's or subcontractor's agreements with employees or independent contractors that may not be enforced in a court of the United States.

(d) The Secretary of Defense may waive the applicability of the restrictions of paragraph (b) of this clause in accordance with Defense Federal Acquisition Regulation Supplement 222.7404.

(End of clause)

1.158 DFARS 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS - BASIC (SEP 2014)

(a) Definitions. As used in this clause--

"Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

"Toxic or hazardous materials" means--
   (ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or
   (iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited
from storing or disposing of toxic or hazardous materials not owned by DoD on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense. A charge may be assessed for any storage or disposal authorized under any of the exceptions to 10 U.S.C. 2692. If a charge is to be assessed, then such assessment shall be identified elsewhere in the contract with payment to the Government on a reimbursable cost basis.

(c) The Contractor shall include the substance of this clause, including this paragraph (c), in all subcontracts that require, may require, or permit a subcontractor access to a DoD installation, at any subcontract tier.

(End of Clause)

1.159 DFARS 252.223-7008 PROHIBITION OF HEXAVALENT CHROMIUM (JUN 2013)

(a) Definitions. As used in this clause--

"Homogeneous material" means a material that cannot be mechanically disjointed into different materials and is of uniform composition throughout.

(1) Examples of homogeneous materials include individual types of plastics, ceramics, glass, metals, alloys, paper, board, resins, and surface coatings.

(2) Homogeneous material does not include conversion coatings that chemically modify the substrate. Mechanically disjointed means that the materials can, in principle, be separated by mechanical actions such as unscrewing, cutting, crushing, grinding, and abrasive processes.

(b) Prohibition.

(1) Unless otherwise specified by the Contracting Officer, the Contractor shall not provide any deliverable or construction material under this contract that--

(i) Contains hexavalent chromium in a concentration greater than 0.1 percent by weight in any homogenous material; or

(ii) Requires the removal or reapplication of hexavalent chromium materials during subsequent sustainment phases of the deliverable or construction material.

(2) This prohibition does not apply to hexavalent chromium produced as a by-product of manufacturing processes.

(c) If authorization for incorporation of hexavalent chromium in a deliverable or construction material is required, the Contractor shall submit a request to the Contracting Officer.

(d) Subcontracts. The Contractor shall include the substance of this clause, including this paragraph (d), in all subcontracts, including subcontracts for commercial items, that are for supplies, maintenance and repair services, or construction materials.

(End of clause)


(a) Definitions. As used in this clause--

"Indian" means -
(1) Any person who is a member of any Indian tribe, band, group, pueblo, or community that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs (BIA) in accordance with 25 U.S.C. 1452(c); and

(2) Any "Native" as defined in the Alaska Native Claims Settlement Act (43 U.S.C. 1601 et seq.).

"Indian organization" means the governing body of any Indian tribe or entity established or recognized by the governing body of an Indian tribe for the purposes of 25 U.S.C. Chapter 17.

"Indian-owned economic enterprise" means any Indian-owned (as determined by the Secretary of the Interior) commercial, industrial, or business activity established or organized for the purpose of profit, provided that Indian ownership constitutes not less than 51 percent of the enterprise.

"Indian tribe" means any Indian tribe, band, group, pueblo, or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, that is recognized by the Federal Government as eligible for services from BIA in accordance with 25 U.S.C. 1452(c).

"Interested party" means a contractor or an actual or prospective offeror whose direct economic interest would be affected by the award of a subcontract or by the failure to award a subcontract.

"Native Hawaiian small business concern" means an entity that is-

(1) A small business concern as defined in Section 3 of the Small Business Act (15 U.S.C. 632) and relevant implementing regulations; and

(2) Owned and controlled by a Native Hawaiian as defined in 25 U.S.C. 4221(9).

(b) The Contractor shall use its best efforts to give Indian organizations, Indian-owned economic enterprises, and Native Hawaiian small business concerns the maximum practicable opportunity to participate in the subcontracts it awards, to the fullest extent consistent with efficient performance of the contract.

(c) The Contracting Officer and the Contractor, acting in good faith, may rely on the representation of an Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern as to its eligibility, unless an interested party challenges its status or the Contracting Officer has independent reason to question that status.

(d) In the event of a challenge to the representation of a subcontractor, the Contracting Officer will refer the matter to-

(1) For matters relating to Indian organizations or Indian-owned economic enterprises:

U.S. Department of the Interior
Bureau of Indian Affairs
Attn: Chief, Division of Contracting and Grants Administration
1849 C Street NW, MS-2626-MIB
Washington, DC 20240-4000.

The BIA will determine the eligibility and will notify the Contracting Officer.

(2) For matters relating to Native Hawaiian small business concerns:
Department of Hawaiian Home Lands
PO Box 1879
Honolulu, HI 96805.

The Department of Hawaiian Home Lands will determine the eligibility and will notify the Contracting Officer.

(e) No incentive payment will be made-

(1) While a challenge is pending; or
(2) If a subcontractor is determined to be an ineligible participant.

(f)(1) The Contractor, on its own behalf or on behalf of a subcontractor at any tier, may request an incentive payment in accordance with this clause.

(2) The incentive amount that may be requested is 5 percent of the estimated cost, target cost, or fixed price included in the subcontract at the time of award to the Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(3) In the case of a subcontract for commercial items, the Contractor may receive an incentive payment only if the subcontracted items are produced or manufactured in whole or in part by an Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(4) The Contractor has the burden of proving the amount claimed and shall assert its request for an incentive payment prior to completion of contract performance.

(5) The Contracting Officer, subject to the terms and conditions of the contract and the availability of funds, will authorize an incentive payment of 5 percent of the estimated cost, target cost, or fixed price included in the subcontract awarded to the Indian organization, Indian-owned economic enterprise, or Native Hawaiian small business concern.

(6) If the Contractor requests and receives an incentive payment on behalf of a subcontractor, the Contractor is obligated to pay the subcontractor the incentive amount.

(g) The Contractor shall insert the substance of this clause, including this paragraph (g), in all subcontracts exceeding $500,000.

(End of clause)

1.161 DFARS 252.227-7022 GOVERNMENT RIGHTS (UNLIMITED) (MAR 1979)

The Government shall have unlimited rights, in all drawings, designs, specifications, notes and other works developed in the performance of this contract, including the right to use same on any other Government design or construction without additional compensation to the Contractor. The Contractor hereby grants to the Government a paid up license throughout the world to all such works to which he may assert or establish any claim under design patent or copyright laws. The Contractor for a period of three (3) years after completion of the project agrees to furnish the original or copies of all such works on the request of the Contracting Officer.

(End of clause)
1.162  DFARS 252.227-7023  DRAWINGS AND OTHER DATA TO BECOME PROPERTY OF GOVERNMENT (MAR 1979)

All designs, drawings, specifications, notes and other works developed in the performance of this contract shall become the sole property of the Government and may be used on any other design or construction without additional compensation to the Contractor. The Government shall be considered the "person for whom the work was prepared" for the purpose of authorship in any copyrightable work under 17 U.S.C. 201(b). With respect thereto, the Contractor agrees not to assert or authorize others to assert any rights nor establish any claim under the design patent or copyright laws. The Contractor for a period of three (3) years after completion of the project agrees to furnish all retained works on the request of the Contracting Officer. Unless otherwise provided in this contract, the Contractor shall have the right to retain copies of all works beyond such period.

(End of clause)

1.163  DFARS 252.227-7033  RIGHTS IN SHOP DRAWINGS (APR 1966)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower-tier subcontractor pursuant to a construction contract, showing in detail

(i) the proposed fabrication and assembly of structural elements and

(ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier.

(End of clause)

1.164  DFARS 252.231-7000  SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR) allowability shall also be determined in accordance with part 231 of the DoD FAR Supplement, in effect on the date of this contract.

(End of clause)

1.165  DFARS 252.232-7005  REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)

(a) The Government will reimburse the Contractor for any advance payments made by the Contractor, as a mentor firm, to a protege firm, pursuant to an approved mentor-protege agreement, provided-

(1) The Contractor's subcontract with the protege firm includes a provision substantially the same as FAR 52.232-12, Advance Payments;

(2) The Contractor has administered the advance payments in accordance with the policies of FAR Subpart 32.4; and

(3) The Contractor agrees that any financial loss resulting from the failure or inability of the protege firm to repay any unliquidated advance payments is the sole financial responsibility of the Contractor.

(b) For a fixed price type contract, advance payments made to a protege firm shall be paid and administered as if they were 100 percent progress payments. The Contractor shall include as a separate attachment with each Standard Form (SF) 1443, Contractor's Request for Progress Payment, a request for reimbursement of advance payments made to a protege.
The attachment shall provide a separate calculation of lines 14a through 14e of SF 1443 for each protege, reflecting the status of advance payments made to that protege.

(c) For cost reimbursable contracts, reimbursement of advance payments shall be made via public voucher. The Contractor shall show the amounts of advance payments made to each protege on the public voucher, in the form and detail directed by the cognizant contracting officer or contract auditor.

(End of clause)

1.166 DFARS 252.232-7010 LEVIES ON CONTRACT PAYMENTS (DEC 2006)

(a) 26 U.S.C. 6331(h) authorizes the Internal Revenue Service (IRS) to continuously levy up to 100 percent of contract payments, up to the amount of tax debt.

(b) When a levy is imposed on a payment under this contract and the Contractor believes that the levy may result in an inability to perform the contract, the Contractor shall promptly notify the Procuring Contracting Officer in writing, with a copy to the Administrative Contracting Officer, and shall provide--

(1) The total dollar amount of the levy;

(2) A statement that the Contractor believes that the levy may result in an inability to perform the contract, including rationale and adequate supporting documentation; and

(3) Advice as to whether the inability to perform may adversely affect national security, including rationale and adequate supporting documentation.

(c) DoD shall promptly review the Contractor's assessment, and the Procuring Contracting Officer shall provide a written notification to the Contractor including--

(1) A statement as to whether DoD agrees that the levy may result in an inability to perform the contract; and

(2)(i) If the levy may result in an inability to perform the contract and the lack of performance will adversely affect national security, the total amount of the monies collected that should be returned to the Contractor; or

(ii) If the levy may result in an inability to perform the contract but will not impact national security, a recommendation that the Contractor promptly notify the IRS to attempt to resolve the tax situation.

(d) Any DoD determination under this clause is not subject to appeal under the Contract Disputes Act.

(End of clause)

1.167 DFARS 252.236-7000 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN (DEC 1991)

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.
(b) The price breakdown—
   (1) Must include sufficient detail to permit an analysis of profit, and of all costs for—
      (i) Material;
      (ii) Labor,
      (iii) Equipment;
      (iv) Subcontracts; and
   (2) Must cover all work involved in the modification, whether the work was deleted, added, or changed.
(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.
(d) The Contractor’s proposal shall include a justification for any time extension proposed.

(End of clause)

1.168 DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR Part 31 and DRARS Part 231, in effect on the date of this contract, apply.

(End of clause)

1.169 DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (DEC 2012)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b) In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:

I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of my knowledge and belief.

------------------------------------------------------------------------------------------------------------------
(Official’s Name)
------------------------------------------------------------------------------------------------------------------
(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including—

(1) Certified cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation; and

(2) Data other than certified cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if certified cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause...
1.170  DFARS 252.247-7023   TRANSPORTATION OF SUPPLIES BY SEA - BASIC (APR 2014)

(a) Definitions.
As used in this clause--
"Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.
"Department of Defense" (DOD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.
"Foreign-flag vessel" means any vessel that is not a U.S.-flag vessel.
"Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.
"Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime Contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.
"Supplies" means all property, except land and interests in lard, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(b) (1) The Contractor shall use U.S.-flag vessels when transporting any supplies by sea under this contract.
(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessel if--

(i) This Contract is a construction contract; or

(ii) The supplies being transported are-

(A) Noncommercial items; or

(B) Commercial items that-

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment); or

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the
Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that--

(1) U.S.-flag vessels are not available for timely shipment;
(2) The freight charges are inordinately excessive or unreasonable; or
(3) Freight charges are higher that charges to private persons for transportation of like goods.

(d) The Contractor must submit any request for use of foreign-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum--

(1) Type, weight, and cube of cargo;
(2) Required shipping date;
(3) Special handling and discharge requirements;
(4) Loading and discharge points;
(5) Name of shipper and consignee;
(6) Prime contract number, and
(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, 400 Seventh Street SW, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information--

(1) Prime contract number;
(2) Name of vessel;
(3) Vessel flag of registry;
(4) Date of loading;
(5) Port of loading;
(6) Port of final discharge;
(7) Description of commodity;
(8) Gross weight in pounds and cubic feet if available;
(9) Total ocean freight in U.S. dollars; and
(10) Name of the steamship company.

(f) If this contract exceeds the simplified acquisition threshold, the Contractor shall provide with its final invoice under this contract a representation that to the best of its knowledge and belief--

(1) No ocean transportation was used in the performance of this contract;
(2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;
(3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all foreign-flag ocean transportation; or
(4) Ocean transportation was used and some or all of the shipments were made on foreign-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in
the following format;

<table>
<thead>
<tr>
<th>ITEM</th>
<th>CONTRACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION</td>
<td>LINE ITEMS</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
</tr>
</tbody>
</table>

(g) If this contract exceeds the simplified acquisition threshold and the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of foreign-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) In the award of subcontracts for the types of supplies described in paragraph (b)(2) of this clause, including subcontracts for commercial items, the Contractor shall flow down the requirements of this clause as follows:

1. The Contractor shall insert the substance of this clause, including this paragraph (h), in subcontracts that exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation.

2. The Contractor shall insert the substance of paragraphs (a) through (e) of this clause, and this paragraph (h), in subcontracts that are at or below the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation.

(End of clause)
transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.
(End of clause)

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PART 3 EXECUTION (NOT USED)

-- End of Section --
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SECTION 00 73 00

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1.20  (UAI 5152.236-9010) GOVERNMENT RE-USE OF DESIGN (MAY 2006)
1.21  (UAI 5152.222-9000) CONTRACTOR SUPPLY AND USE OF ELECTRONIC SOFTWARE FOR PROCESSING CONSTRUCTION WAGE RATE REQUIREMENTS STATUTE CERTIFIED LABOR PAYROLLS (APRIL 2011)
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PART 2  NOT USED

PART 3  NOT USED
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PART 1   GENERAL

1.1 (FAR 52.211-10) COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within ten (10) calendar days after the date the Contractor receives the Notice to Proceed, (b) prosecute said work diligently, and (c) complete the entire work ready for use not later than the number of calendar days (which includes design, design reviews and all construction activities) indicated on the awarded Standard Form SF 1442 (Page 00 10 00-1) for this contract. The time stated for completion of the project shall include final cleanup of the premises.

(End of clause)

1.2 (FAR 52.211-12) LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)

(a) If the Contractor fails to complete the work within the time inserted on the PRICING SCHEDULE and in Item 11 on page 00 10 00-1 of Standard Form 1442, the Contractor shall pay liquidated damages to the Government in the amount of $1,321 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

1.3 (FAR 52.211-14) NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE, EMERGENCY PREPAREDNESS, AND ENERGY PROGRAM USE (APR 2008)

Any contract awarded as a result of this solicitation will be a DO rated order certified for national defense, emergency preparedness, and energy program use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation.

(End of provision)

1.4 (FAR 52.222-23) NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of
(b) The goals for minority and female participation, expressed in percentage terms for the Contractor’s aggregate workforce in each trade on all construction work in the covered area, are as follows:

<table>
<thead>
<tr>
<th>Goals for Minority Participation for Each Trade</th>
<th>Goals for Female Participation for Each Trade</th>
</tr>
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<tbody>
<tr>
<td>13.8</td>
<td>6.9</td>
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</table>

These goals are applicable to all the Contractor’s construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs Office.

(c) The Contractor’s compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor’s goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the -

1. Name, address, and telephone number of the subcontractor;
2. Employer identification number of the subcontractor;
3. Estimated dollar amount of the subcontract;
4. Estimated starting and completion dates of the subcontract; and
5. Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Denver-Boulder SMSA 2080, of which Arapahoe county is a part.
1.5 (FAR 52.236-1) PERFORMANCE OF WORK BY CONTRACTOR (APR 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty (20) percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

(End of clause)

1.6 (FAR 52.236-4) PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractors' information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

(a) The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys, soil borings, etc. The data shown graphically and by symbol for each respective boring represents the actual geologic features observed and logged at the location given on the drawings. While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, local minor variations characteristic of the subsurface materials of this region could occur.

(b) Weather conditions shall have been investigated by the Contractor to satisfy himself as to the hazards likely to arise therefrom. Complete weather records and reports may be obtained from the local U.S. Weather Bureau.

(c). Transportation facilities shall have been investigated by the Contractor to satisfy himself as to the existence of access highways and railroad facilities.

(End of clause)

1.7 (UAI 5152.231-9000) EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)

Note: Copies of each regional schedule may be obtained through the following Internet site: 
http://www.publications.usace.army.mil/USACEPublications/EngineerPamphlets.aspx. Currently the "Construction Equipment Ownership and Operating Expense Schedule" can be accessed on page 11 of 14 of the afore indicated URL.

(a) This clause does not apply to terminations. See UAI 5152.249-9000, Basis for settlement of proposals and FAR Part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the Contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series of equipment from the Contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense
Schedule," Region V. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be developed using the formula provided in the schedule. For forward pricing, the Schedule in effect at the time of negotiations shall apply. For retrospective pricing, the Schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small acquisition threshold (SAT), the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet.

1.8 (UAI 5152.232-9000) PAYMENT FOR MATERIALS DELIVERED OFF-SITE (MAR 2009)

(a) Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to:

1. materials required by the technical provisions; or

2. materials that have been fabricated to the point where they are identifiable to an item of work required under this contract; or

3. Items specifically listed below.

(b) Payment for materials delivered off-site shall be made only after receipt of paid invoices listing the value of material and labor incorporated in the items along with a canceled check showing the prime contractor's title to the time delivered off site. Payment for materials delivered off-site shall be limited to the following items:

(List specific material items to be considered for payment when off-site delivery is made.)

1.9 (DFARS 252.236-7001) CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall-
(1) Check all drawings furnished immediately upon receipt;
(2) Compare all drawings and verify the figures before laying out the work;
(3) Promptly notify the Contracting Officer of any discrepancies;
(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and
(5) Reproduce and print contract drawings and specifications as indicated in Section 01 30 00.24 OTHER ADMINISTRATIVE AND SPECIAL REQUIREMENTS.

(c) In general--
(1) Large-scale drawings shall govern small-scale drawings; and
(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

<table>
<thead>
<tr>
<th>Title</th>
<th>File</th>
<th>Drawing No.</th>
</tr>
</thead>
</table>

See drawings appendix for complete index of drawings.

(End of clause)
Specifications and Drawings for Construction)

(3) All other provisions of the accepted proposal.

(4) Any design products including, but not limited to, plans, specifications, engineering studies and analyses, shop drawings, equipment installation drawings, etc. These are "deliverables" under the contract and are not part of the contract itself. Design products must conform with all provisions of the contract, in the order of precedence herein.

(End of clause)

1.11 (UAI 5152.236-9001) PERSONNEL, SUBCONTRACTORS AND OUTSIDE ASSOCIATES OR CONSULTANTS (MAY 2006)

In connection with this contract, any in-house personnel, subcontractors, and outside associates or consultants will be limited to individuals or firms that were specifically identified in the Contractor's accepted proposal. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated in-house personnel, subcontractors, associates, or consultants. If the Contractor proposes a substitution, it shall submit the same type of information that was submitted in the accepted proposal to the Contracting Officer for evaluation and approval. The level of qualifications and experience submitted in the accepted proposal or that required by the Solicitation, whichever is greater, is the minimum standard for any substitution.

(End of clause)

1.12 (UAI 5152.236-9002) GOVERNMENT-FURNISHED SPECIFICATIONS, DRAWINGS, SURVEYS, AND SPECIFICATIONS IN THE REQUEST FOR PROPOSAL (JUL 2002)

This is to clarify DFARS 252.236-7001, Contract Drawings and Specifications, refers to any Government-furnished design or design criteria included in the Request for Proposal (RFP).

(End of clause)

1.13 (UAI 5152.236-9003) GOVERNMENT-FURNISHED SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (JUL 2003)

This is to clarify FAR 52.236-21, Specifications and Drawings for Construction, refers to any specifications and drawings furnished in the Request for Proposal (RFP). The term "specifications" refers to the design criteria or scope of work, in addition to any attached specifications.

(End of clause)

1.14 (UAI 5152.236-9004) RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN (MAY 2002)

(a) The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and other non-construction services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiency in its designs, drawings, specifications, and other non-construction services and perform any necessary rework or modifications, including any damage to real or personal property, resulting from the design error or omission.

(b) The standard of care for all design services performed under this agreement shall be the care and skill ordinarily used by members of the architectural or engineering professions practicing under similar
conditions at the same time and locality. Notwithstanding the above, in the event that the contract specifies that portions of the Work be performed in accordance with a performance standard, the design services shall be performed so as to achieve such standards.

(c) Neither the Government’s review, approval or acceptance of, nor payment for, the services required under this contract, shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract. The Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor’s negligent performance of any of these services furnished under this contract.

(d) The rights and remedies of the Government provided for under this contract are in addition to any other rights and remedies provided by law.

(e) If the Contractor is comprised of more than one legal entity, each entity shall be jointly and severally liable hereunder.

(End of clause)

1.15 (UAI 5152.236-9005) WARRANTY OF DESIGN (MAY 2002)

(a) The Contractor warrants that the design shall be performed in accordance with the contract requirements. Design and design related construction not conforming to the Contract requirements shall be corrected at no additional cost to the Government. The standard of care for design is defined in paragraph (b) of special contract requirement UAI 5152.236-9004, Responsibility of the Contractor for Design.

(b) The period of this warranty shall commence upon final completion and the Government’s acceptance of the work, or in the case of the Government’s beneficial occupancy of all or part of the work for its convenience, prior to final completion and acceptance, at the time of such occupancy.

(c) This design warranty shall be effective from the above event through the Statue of Limitations and Statute of Repose, as applicable to the state that the project is located in.

(d) The rights and remedies of the Government provided for under this clause are in addition to any other rights and remedies provided in this contract or by law.

(End of Clause)

1.16 (UAI 5152.236-9006) DEVIATING FROM THE ACCEPTED DESIGN (JUN 2002)

(a) The Contractor must obtain the approval of the Designer of Record and the Government’s concurrence for any Contractor proposed revision to the professionally stamped and sealed and Government reviewed design, before proceeding with the revision. The Government reserves the right to disapprove such a revision.

(b) The Government reserves the right to non-concur with any revision to the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed design.

(c) Any revision to the design, which deviates from the contract requirements (i.e., the RFP and the accepted proposal), will require a bilateral modification (e.g. supplemental agreement) to the contract before any work commences.
(d) Unless the Government initiates a change to the contract requirements, or the Government determines that the Government furnished design criteria are incorrect and must be revised, any Contractor initiated proposed change to the contract requirements, which results in additional cost, shall strictly be at the Contractor's expense.

(e) The Contractor shall track all approved revisions to the reviewed and accepted design and shall incorporate them into the as-built design documentation, in accordance with agreed procedures. The Designer of Record shall document its professional concurrence on the as-builts for any revisions in the stamped and sealed drawings and specifications.

(End of clause)

1.17 (UAI 5152.236-9007) CONTRACTOR'S ROLE DURING DESIGN PROCESS (JUN 1998)

The Contractor's construction management key personnel shall be actively involved during the design process to effectively integrate the design and construction requirements of this contract. In addition to the typical required construction activities, the Contractor's involvement includes, but is not limited to actions such as: integrating the design schedule into the Master Schedule to maximize the effectiveness of fast-tracking design and construction (within the limits allowed in the contract), ensuring constructability and economy of the design, integrating the shop drawing and installation drawing process into the design, executing the material and equipment acquisition programs to meet critical schedules, effectively interfacing the construction QC program with the design QC program, and maintaining and providing the design team with accurate, up-to-date redline and as-built documentation. The Contractor shall require and manage the active involvement of key trade subcontractors in the above activities.

(End of clause)

1.18 (UAI 5152.236-9008) VALUE ENGINEERING AFTER AWARD (JUN 1999)

(a) In reference to FAR 52.248-3, Value Engineering-Construction, the Government may refuse to entertain a "Value Engineering Change Proposal" (VECP) for those "performance oriented" aspects of the Solicitation documents which were addressed in the Contractor's accepted contract proposal and which were evaluated in competition with other offerors for award of this contract.

(b) The Government may consider a VECP for those "prescriptive" aspects of the Solicitation documents, not addressed in the Contractor's accepted contract proposal or addressed but evaluated only for minimum conformance with the Solicitation requirements.

(c) For purposes of this clause, the term "performance oriented" refers to those aspects of the design criteria or other contract requirements which allow the offeror or Contractor certain latitude, choice of and flexibility to propose in its accepted contract offer a choice of design, technical approach, design solution, construction approach or other approach to fulfill the contract requirements. Such requirements generally tend to be expressed in terms of functions to be performed, performance required or essential physical characteristics, without dictating a specific process or specific design solution for achieving the desired result.

(d) In contrast, for purposes of this clause, the term "prescriptive" refers to those aspects of the design criteria or other Solicitation requirements wherein the Government expressed the design solution or other
requirements in terms of specific material, approaches, systems, and/or processes to be used. Prescriptive aspects typically allow the offerors little or no freedom in the choice of design approach, materials, fabrication techniques, methods of installation, or any other approach to fulfill the contract requirements.

(End of clause)

1.19 (UAI 5152.236-9009) PARTNERING (FEB 2000)

In order to most effectively accomplish this contract, the Government proposes to form a partnership with the Contractor to develop a cohesive building team. It is anticipated that this partnership would involve the relevant personnel at the installation and/or facility at which work for each task order will be performed, the Contractor, primary subcontractors and designers and the Corps of Engineers. This partnership would strive to develop a cooperative management team drawing on the strengths of each team member in an effort to achieve a quality project within budget and on schedule. This partnership would be bilateral in membership and participation will be totally voluntary. Any cost associated with effectuating this partnership, excluding travel and lodging cost of Government personnel, will be borne by each party. The partnering meetings shall be held in a location and at a date and time mutually agreed upon by representatives of each interested party at the pre-construction meeting.

(End of clause)

1.20 (UAI 5152.236-9010) GOVERNMENT RE-USE OF DESIGN (MAY 2006)

In conjunction with the Clause 252.227-7022, GOVERNMENT RIGHTS UNLIMITED, the Government will not ask for additional originals or copies of the design works after the Contractor provides all required design documentation and as-built documentation under the instant contract. Further, if the Government uses the design for other projects without additional compensation to the Contractor for re-use, the Government releases the Contractor from liability in the design on the other projects, due to defects in the design that are not the result of fraud, gross mistake as amounts to fraud, gross negligence or intentional misrepresentation.

(End of clause)

1.21 (UAI 5152.222-9000) CONTRACTOR SUPPLY AND USE OF ELECTRONIC SOFTWARE FOR PROCESSING CONSTRUCTION WAGE RATE REQUIREMENTS STATUTE CERTIFIED LABOR PAYROLLS (APRIL 2011)

(a) The Contractor is encouraged to use a commercially-available electronic system to process and submit certified payrolls electronically to the Government. The requirements for preparing, processing and providing certified labor payrolls are established by the Wage Rate Requirements statute.

(b) If the Contractor elects to use an electronic payroll processing system, then the Contractor shall be responsible for obtaining and providing for all access, licenses, and other services required to provide for receipt, processing, certifying, electronically transmitting to the Government, and storing weekly payrolls and other data required for the Contractor to comply with the Wage Rate Requirements statute. When the Contractor uses an electronic payroll system, the electronic payroll service shall be used by the Contractor to prepare, process, and maintain
the relevant payrolls and basic records during all work under this construction contract and the electronic payroll service shall be capable of preserving these payrolls and related basic records for the required 3 years after contract completion. If the Contractor chooses to use an electronic payroll system, then the contractor shall obtain and provide electronic system access to the Government, as required to comply with the Wage Rate Requirements over the duration of this construction contract. The access shall include electronic review access by the Government contract administration office to the electronic payroll processing system used by the contractor.

(c) The Contractor's provision and use of an electronic payroll processing system shall meet the following basic functional criteria:

(1) commercially available;

(2) compliant with appropriate Wage Rate Requirements statute payroll provisions in the FAR;

(3) able to accommodate the required numbers of employees and subcontractors planned to be employed under the contract;

(4) capable of producing an Excel spreadsheet-compatible electronic output of weekly payroll records (format at http://rms.usace.army.mil) for export in an Excel spreadsheet to be imported into the Contractor's Quality Control System (QCS) version of Resident Management System (RMS); that in turn shall export payroll data to the Government's Resident Management System (RMS);

(5) demonstrated security of data and data entry rights;

(6) ability to produce Contractor-certified electronic versions of weekly payroll data;

(7) ability to identify erroneous entries and track the data/time of all versions of the certified Wage Rate Requirements statute payrolls submitted to the government over the life of the contract;

(8) capable of generating a durable record copy, that is, a CD or DVD and PDF file record of data from the system database at end of the contract closeout. This durable record copy of data from the electronic Construction Wage Rate payroll processing system shall be provided to the Government during contract closeout.

(d) All Contractor-incurred costs related to the Contractor's provision and use of an electronic payroll processing service shall be included in the Contractor's price for the overall work under the contract. The costs for compliance with the Wage Rate Requirements statute by using electronic payroll processing services shall not be a separately bid or reimbursed item under this contract.

(End of Clause)

1.22 (UAI 5115.504) AWARD TO SUCCESSFUL OFFEROR

Only a warranted Contracting Officer (either a Procuring Contracting Officer (PCO), or an Administrative Contracting Officer (ACO)), acting within their delegated limits, has the authority to issue modifications or otherwise change the terms and conditions of this contract. If an individual other than the Contracting Officer attempts to make changes to
the terms and conditions of this contract you shall not proceed with the change and shall immediately notify the Contracting Officer. Proceeding with any work not authorized by the Contracting Officer will be at the Contractor's own risk.

1.23 (UAI 5122.1302-100) VETERANS EMPLOYMENT EMPHASIS FOR U.S. ARMY CORPS OF ENGINEERS CONTRACTS

In addition to complying with the requirements outlined in FAR Part 22.13, FAR Provision 52.222-38, FAR Clause 52.222-35, FAR Clause 52.222-37, DFARS 222.13 and Department of Labor regulations, U.S. Army Corps of Engineers (USACE) contractors and subcontractors at all tiers are encouraged to promote the training and employment of U.S. veterans while performing under a USACE contract. While no set-aside, evaluation preference, or incentive applies to the solicitation or performance under the resultant contract, USACE contractors are encouraged to seek out highly qualified veterans to perform services under this contract. The following resources are available to assist USACE contractors in their outreach efforts:

U.S. Department of Labor Veterans employment: https://www.vets.gov/


Department of Labor Veterans Employment Assistance http://www.dol.gov/vets/

Department of Veterans Affairs-VOW to Hire Heros Act http://benefits.va.gov/vow/


U.S. Chamber of Commerce Foundation-Hiring Our Heros https://www.uschamberfoundation.org/hiring-our-heroes

Guide to Hiring Veterans - Reference Material https://www.whitehouse.gov/sites/default/files/docs/white_house_business_council_-_guide...
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PART 3 NOT USED

ATTACHMENTS:

Project Sign Details

General Wage Decision Nos. CO170012 and CO170026

-- End of Section Table of Contents --
PART 1   GENERAL

Attachments:

Project Sign Details
General Wage Decision Nos. CO170012 and CO170026

1.1   COMPLETION OF WORK

See Section 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS), FAR 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984).

1.1.1   Sequence of Design-Construction

(a) After receipt of the Contract Notice to Proceed (NTP), the Contractor shall initiate design, comply with all design submission requirements as covered in Division 01 General Requirements of the advertised Solicitation, and obtain Government review of each submission. No construction may be started until the Government reviews the 100 Percent Corrected Design submission and determines it satisfactory for purposes of beginning construction. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the Contracting Officer, the initial submission failed to meet the minimum quality requirements as set forth in the Contract.

(b) If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed 100 Percent Corrected Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Government. Proceeding with limited construction requires written authorization by the Contracting Officer.

1.2   CONTRACTOR PERFORMANCE EVALUATIONS

Federal Acquisition Regulation (FAR) Subpart 36.201(Evaluation of Contractor Performance) requires evaluation of the construction contractor's performance throughout the contract period of performance. The United States Army Corps of Engineers (USACE) follows the procedures outlined in Engineering and Construction Bulletin 2014-13 to fulfill this FAR requirement. For construction contracts valued at or above $650,000.00, including all modifications, the USACE will evaluate Contractor's performance using the web-based Contractors Performance Assessment Reporting System (CPARS). After the USACE drafts an evaluation (interim or final), the Contractor will have the opportunity to access, review, comment and either concur or non-concur with the evaluation in the CPARS system for a period of 60 days. Access to the CPARS system requires either specific software called PKI certification (recommended method) or a username and
password. The PKI certification is a Department of Defense recommendation and to provide security in electronic transactions. The certification software could cost approximately $110 - $125 per certificate per year and may be purchased from an External Certificate Authorities (ECA) vendor. Current information about the PKI certification process and contacting vendors can be found on the web site: https://www.cpars.gov.

1.3 LIQUIDATED DAMAGES-CONSTRUCTION

See Section 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS), FAR 52.211-12 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000).

1.4 ANTITERRORISM (AT)/OPERATIONS SECURITY (OPSEC) PROVISIONS

1. AT Level I Training

All Contractor employees, to include subcontractor employees, requiring access to Army installations, facilities and controlled access areas shall complete AT Level I awareness training within 30 calendar days after contract start date or effective date of incorporation of this requirement into the contract, whichever is applicable. Upon request, the Contractor shall submit certificates of completion for each affected Contractor employee and subcontractor employee, to the COR or to the contracting officer (if a COR is not assigned), within 5 calendar days after completion of training by all employees and subcontractor personnel. AT Level I awareness training is available at the following website: http://jko.jten.mil/courses/atl1/launch.html; or it can be provided by the RA ATO in presentation form which will be documented via memorandum.

2. Access and General Protection/Security Policy and Procedures

All contractor and all associated sub-contractors employees shall comply with applicable installation, facility and area commander installation/facility access and local security policies and procedures (provided by government representative). The contractor shall also provide all information required for background checks to meet installation/facility access requirements to be accomplished by installation Provost Marshal Office, Director of Emergency Services or Security Office. Contractor workforce must comply with all personal identity verification requirements (FAR clause 52.204-9, Personal Identity Verification of Contractor Personnel) as directed by DOD, HQDA and/or local policy. In addition to the changes otherwise authorized by the changes clause of this contract, should the Force Protection Condition (FPCON) at any installation or facility change, the Government may require changes in contractor security matters or processes.

2b. for Contractors Who Do Not Require CAC, But Require Access To A Dod Facility Or Installation

Contractor and all associated sub-contractors employees shall comply with adjudication standards and procedures using the National Crime Information Center Interstate Identification Index (NCIC-III) and Terrorist Screening Database (TSDB) (Army Directive 2014-05 / AR 190-13), applicable installation, facility and area commander installation/facility access and local security policies and procedures (provided by government representative, as NCIC and TSDB are available), or, at OCONUS locations, in accordance with status of forces agreements and other theater regulations.
3. Not Used

4. Suspicious Activity Reporting Training (e.g. iWATCH, CorpsWatch, or See Something, Say Something)

The contractor and all associated sub-contractors shall receive a brief/training (provided by the RA) on the local suspicious activity reporting program. This locally developed training will be used to inform employees of the types of behavior to watch for and instruct employees to report suspicious activity to the project manager, security representative or law enforcement entity. This training shall be completed within 30 calendar days of contract award and within 30 calendar days of new employees commencing performance with the results reported to the COR NLT 5 calendar days after the completion of the training.


Not Applicable

6. OPSEC Standing Operating Procedure/Plan

Not Applicable

7. OPSEC Training

All new contractor employees will complete Level I OPSEC Training within 30 calendar days of their reporting for duty. Additionally, all contractor employees must complete annual OPSEC awareness training. The contractor shall submit certificates of completion for each affected contractor and subcontractor employee, to the COR or to the contracting officer (if a COR is not assigned), within 5 calendar days after completion of training. OPSEC awareness training is available at the following websites: https://www.iad.gov/ioss/ or http://www.cdse.edu/catalog/operations-security.html; or it can be provided by the RA OPSEC Officer in presentation form which will be documented via memorandum.

8. Information Assurance (IA)/Information Technology (IT) Training

Not Applicable

9. Information Assurance (IA)/Information Technology (IT) Certification

Not Applicable

10. Not Used

11. Not Used

12. Handling or Access to Classified Information.

Not Applicable

13. Will be Escorted in Areas Where They May be Exposed to Classified and/or Sensitive Materials and/or Sensitive or Restricted Areas

If applicable, all contract employees, including subcontractor employees who are not in possession of the appropriate security clearance or access privileges, will be escorted in areas where they may be exposed to
classified and/or sensitive materials and/or sensitive or restricted areas.

14. Contractor Company to Obtain a Facility Clearance and Individual Clearances at the Appropriate Level

The Prime Contractor Company must have (or will have) a Facility Clearance (FCL) at the appropriate level (IAW the NISPOM DOD 5220.22-M and AR 380-49) prior to the start of the contract awarded period of performance. Contractor personnel performing work under this contract must have the required security clearance, per AR 380-67, at the appropriate level at the start of the period of performance. Security Clearances and FCL requirements are required to be maintained for the life of the contract IAW the DD254 attached to the contract. If no FCL, the supporting Government Contracting Activity will sponsor the prime contract company in obtaining the FCL.

15. Pre-Screen Candidates using E-Verify Program

The Contractor must pre-screen Candidates using the E-verify Program (http://www.uscis.gov/e-verify) website to meet the established employment eligibility requirements. The Vendor must ensure that the Candidate has two valid forms of Government issued identification prior to enrollment to ensure the correct information is entered into the E-verify system. An initial list of verified/eligible Candidates must be provided to the COR no later than 3 business days after the initial contract award.

16. Required Armed Security Guards

Not Applicable

17. Threat Awareness Reporting Program (TARP) Training

All new contractor employees will complete annual Threat Awareness and Reporting Program (TARP) Training provided by a Counterintelligence Agent, IAW AR 381-12. The contractor shall submit certificates of completion for each affected contractor and subcontractor employee(s) or a memorandum for the record, to the COR or to the contracting officer (if a COR is not assigned), within 5 calendar days after completion of training. Authorized webbased TARP training for CAC card holders is available at the following website: https://www.us.army.mil/suite/page/655474

1.5 DESIGN-BUILD CONTRACT - ORDER OF PRECEDENCE

(a) The contract includes the standard contract clauses and schedules current at the time of contract award. It entails (1) the solicitation in its entirety, including all drawings, cuts, and illustrations, and any amendments, and (2) the successful offeror's accepted proposal. The contract constitutes and defines the entire agreement between the Contractor and the Government. No documentation shall be omitted which in any way bears upon the terms of that agreement.

(b) In the event of conflict or inconsistency between any of the provisions of this contract, precedence shall be given in the following order:

(1) Betterments: Any portion of the accepted proposal, which both conform to and exceed the provisions of the solicitation. "Betterment" is defined as any product, component, or system, which exceeds the requirements stated in the solicitation.
(2) The provisions of the solicitation. (See also GENERAL CONDITIONS (CONTRACT CLAUSES) Clause entitled "SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION").

(3) All other provisions of the accepted proposal.

(4) Any design products including, but not limited to, plans, specifications, engineering studies and analyses, shop drawings, equipment installation drawings, etc. These are "deliverable" under the contract and are not part of the contract itself. Design products must conform with all the provisions of the contract, in the order of precedence herein.

(c) Where conflicts between the solicitation requirements and the UFGS guide specifications (available as indicated in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES) exist, the solicitation requirements shall take precedence. Any installation requirements within solicitation requirements, but not contained in the UFGS guide specifications, shall be added to the specifications or shown on the drawings.

1.6 RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN

(a) The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and any other non-construction services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiency in its designs, drawings, specifications, and other non-construction services.

(b) Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or any cause of action arising out of the performance of this contract, and the Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor's negligent performance of any of the services described in paragraph (a) furnished under this contract.

(c) The rights and remedies of the Government provided under this contract are in addition to any other rights and remedies provided by law.

1.7 ORDER OF WORK

Construction of new small arms range facility needs to be finished prior to the demolition of the existing one.

1.8 BUY AMERICAN STATUTE

1.8.1 General Requirements

The Contractor shall obtain materials in compliance with the Buy American statute per the requirements of Section 00 72 00 GENERAL CONDITIONS (CONTRACT CLAUSES). The Buy American Clauses to be utilized for this contract are based on the estimated acquisition value of the solicitation for all Basic and Options items. Buy American statute clauses are listed below:
1.8.2 Not Used

1.9 REQUEST FOR PROPOSAL (RFP) DRAWINGS

Fourteen (14) calendar days after Notice to Proceed, the Government will provide the successful Contractor a CD-ROM containing editable RFP CAD file drawings (file format and general CAD requirements are defined in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES and 01 78 39.00 24 AS-BUILT DRAWINGS) for use in preparation of design drawing deliverables. As-built drawing requirements are specified in Section 01 78 39.00 24 AS-BUILT DRAWINGS.

1.10 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Equipment Room Drawings; G-RO.

This submittal is not required during construction, if equipment room drawings are shown on the 100 percent design submittal.

SD-05 Design Data

USACE BIM PROJECT EXECUTION PLAN (USACE PxP) TEMPLATE; G-DO

1.11 CONCURRENT CONSTRUCTION

Construction work closely related to and/or located at the site of the work, under a concurrent contract, may be in progress simultaneously with work under this contract. The Contractor shall cooperate with others as necessary in the interest of timely completion of all work. In the event of interference, the Contracting Officer shall be notified immediately for resolution and his decision shall be final.

1.12 PAYMENT

1.12.1 PROMPT PAYMENT ACT

Pay requests authorized in GENERAL CONDITIONS (CONTRACT CLAUSES) clause:
"Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause, "Prompt Payment for Construction Contracts". Pay requests will be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation". All information and substantiation required by the identified contract clauses will be submitted with the ENG Form 93, and the required certification will be included on the last page of the ENG Form 93a, signed by an authorized contractor official and dated when signed. The designated billing office is the Office of the Area Engineer.

1.12.2 PAYMENT FOR MATERIALS DELIVERED OFFSITE

See Section 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS) UAI 52.232-5000 PAYMENT FOR MATERIALS DELIVERED OFF-SITE

1.12.3 CONTRACTOR PAYROLL RECORD

Contractor shall be required to log payrolls for all their own employees and subcontractors utilizing ENG Form 3180. Each subcontractor requires a separate ENG 3180 for their payrolls. The Contractor shall maintain the ENG 3180, along with the payrolls, on site and available for review by the Contracting Officer's Representative. The ENG 3180's shall be updated weekly as payrolls are submitted. After making copies for their files, the Contractor is required to submit the originals of each week’s payrolls to the Resident Office. Before final payment, the Contractor shall provide the completed ENG 3180's to the Contracting Officer's Representatives. If the Contractor has elected to use an electronic payroll system, as described in 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS in paragraph (UAI 22.406-6-100) CONTRACTOR SUPPLY AND USE OF ELECTRONIC SOFTWARE FOR PROCESSING CONSTRUCTION WAGE RATE REQUIREMENTS CERTIFIED LABOR PAYROLLS (APRIL 2011), the payroll inventory produced by the electronic payroll system will satisfy the requirements in this paragraph and FAR 52.222-8, Payrolls and Basic Records.

1.13 AVAILABILITY OF UTILITY SERVICES

The Contractor shall arrange with the local utility company for electricity required by him for construction under this project and shall pay all costs in connection therewith. Reasonable amounts of domestic water will be made available to the Contractor by the Government from existing system outlets and supplies. The Contractor shall, at his own expense, make all temporary connections and install distribution lines. The Contractor shall furnish to the Contracting Officer a complete system layout drawing showing type of materials to be used and method of installation for all temporary electrical systems. All temporary lines shall be maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer and shall be removed by the Contractor in like manner prior to final acceptance of the construction. Normal quantities of electricity and water used to make final tests of completely installed systems shall be furnished by the Government.

1.14 UTILITY SERVICE INTERRUPTIONS

The Contractor shall submit written notification not less than 15 calendar days in advance of each interruption of each utility and communication service to or within existing buildings and facilities being used by others. No single outage will exceed 4 hours unless approved in writing. The time and duration of all outages will be coordinated and approved with the Using Agency by the Contracting Officer.
1.15 DIGGING PERMITS AND ROAD CLOSINGS

The Contractor shall allow 14 calendar days from date of written application to receive permission to dig and to close roads. Work on or near roadways shall be flagged in accordance with the safety requirements in Safety and Health Requirements Manual EM 385-1-1, which forms a part of these specifications. Work located along the alert force route shall not cause blockage and the Contractor shall maintain unobstructed access for alert force traffic at all times.

1.16 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This clause specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the GENERAL CONDITIONS (CONTRACT CLAUSES) clause entitled "Default: (Fixed-Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

| MONTHLY ANTICIPATED ADVERSE WEATHER DELAY |
| WORK DAYS BASED ON (5) DAY WORK WEEK |
| JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| (5) | (5) | (3) | (4) | (3) | (4) | (3) | (3) | (2) | (3) | (3) | (7) |

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b. above, the contracting officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the GENERAL CONDITIONS (CONTRACT CLAUSES) clause entitled "Default (Fixed Price Construction)." (ER 415-1-15)

d. Information pertaining to late starts and closures due to weather is
available via the installation's "SNOW call" (phone) line: 720-847-7669. Weather information line will report if Base is closed or if Mission Essential personnel are to report to duty. If Base is closed or Mission Essential personnel are to report, contractor shall not attempt to access Buckley AFB until Base is reopen.

1.17 INSURANCE REQUIRED

In accordance with GENERAL CONDITIONS (CONTRACT CLAUSES) clause: "Insurance Work on a Government Installation," the Contractor shall procure the following minimum insurance:

<table>
<thead>
<tr>
<th>Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workmen's Compensation and Employer's Liability Insurance</td>
<td>$100,000</td>
</tr>
<tr>
<td>General Liability Insurance</td>
<td>$500,000 per occurrence</td>
</tr>
<tr>
<td>Automobile Liability Insurance Bodily injury</td>
<td>$200,000 per person and $500,000 per occurrence</td>
</tr>
<tr>
<td>Property damage</td>
<td>$20,000 per occurrence</td>
</tr>
</tbody>
</table>

(Coverages per FAR 28.307-2)

1.18 SECURITY REQUIREMENTS

1.18.1 Contractor's Employee Identification

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display such identification as may be approved and directed by the Contracting Officer. All prescribed identification shall immediately be delivered to the Contracting Officer, for cancellation upon release of any employees. When the contract involves work in restricted security areas, only employees who are U.S. citizens will be permitted to enter. Proof of U.S. citizenship is required prior to entry. When required by the Contracting Officer, the Contractor shall obtain and submit fingerprints of all persons employed or to be employed on the project. (Based on FAR 52.204-2)

1.18.2 Entry Requirements

[_____][See Section _______]

1.19 CONTRACTOR QUALITY CONTROL (CQC)

See Section 01 45 00.00 10 QUALITY CONTROL.

1.20 NONDOMESTIC CONSTRUCTION MATERIALS

The list of excepted nondomestic construction materials or their components referenced in the Buy American Construction Material Contract Clauses includes the list set forth in paragraph 25.104 of the Federal Acquisition Regulation.

1.21 DAILY WORK SCHEDULES AND WEEKLY COORDINATION MEETINGS

In order to closely coordinate work under this contract, the Contractor
shall prepare a written agenda/meeting minutes and attend a weekly coordination meeting with the Contracting Officer and Using Service at which time the Contractor shall submit for coordination and approval, his proposed daily work schedule for the next two week period. The Contractor shall provide a copy of modifications (MODs), Serial Letters, Requests for Information (RFIs) and any other information that is needed in the minutes of the meeting. Required temporary utility services, time and duration of interruptions, and protection of adjoining areas shall be included with the Contractor's proposed 2-week work schedule. At this meeting, the Contractor shall also submit his schedule of proposed dates and times of all preparatory inspections to be performed during the next 2 weeks. The items of work listed on the proposed 2-week schedule are to be keyed to the NAS by activity number and description for each activity anticipated to be performed during the next 2-week period. Coordination action by the Contracting Officer relative to these schedules will be accomplished during these weekly meetings. Daily reports shall be completed and given to the Contracting Officer or Representative within 24 hours of work. All official correspondence such as serial letters and RFIs, with attachments are to be provided in one hardcopy original with original signatures and one electronic (Adobe pdf format) copy by email. The Government will consider the correspondence to be received when the hardcopy is received by the designated office.

1.22 AS-BUILT DRAWINGS

See SECTION 01 78 39.00 24 - AS-BUILT DRAWINGS

1.23 SIGN

On commencement of work on this project, the Contractor shall furnish and erect the temporary sign in the location selected by the Contracting Officer near the project site. The Contractor shall maintain the sign in good condition through the project construction period. Upon completion of the project the Contractor shall remove the sign from the premises. The project sign shall conform to standard drawing bound herein. A decal of the "Engineer Castle" and the U. S. Air Force emblem will be furnished the Contractor upon request.

1.24 EQUIPMENT ROOM DRAWINGS

Prior to construction, the Contractor shall prepare and submit room plans (see paragraph SUBMITTALS for conditions regarding this submittal under Design/Build procurement) for all mechanical, electrical, and communication rooms or similar areas. The plans shall be consolidated for all trades, shall be to scale, and shall show all pertinent structural features. All equipment shall be accessible and laid out in a good design and workmanship manner and layouts for communications rooms shall be completed as early as possible. In addition, other items such as doors, windows, and cabinets required for installation and which will affect the available space, will be shown. All mechanical and electrical equipment and accessories shall be shown to scale in plan and elevation and/or section in their installed positions. All duct work and piping shall be shown.

1.25 CONTRACTOR FURNISHED EQUIPMENT DATA

See Section 01 78 36.00 24 WARRANTY OF CONSTRUCTION AND DESIGN for Contractor Furnished Equipment Data to be submitted as part of the Warranty Equipment Booklet.
1.26 ASBESTOS AND LEAD

a. The Contractor is warned that inhalation of lead has been associated with health hazards.

b. Lead has been determined to be present in some painted surfaces which are scheduled for removal/renovation. See Section 01 35 29 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS for locations and proper procedures.

1.27 PARTNERING

a. The Government intends to encourage the formation of a cohesive partnership with the Contractor. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objective is effective contract performance in achieving completion within budget, on schedule and in accordance with plans and specifications. This partnership between the Contractor and the Government will be voluntary and its implementation will not be part of the contract requirements nor will it result in a change to contract price or terms.

b. It is anticipated that immediately after the preconstruction conference, the appropriate Contractor's key personnel and Government key personnel will attend a 2-3 hours informal team building workshop at the Area or Resident Office (as directed).

1.28 PROFIT

a. Weighted guidelines method of determining profit shall be used on any equitable adjustment change order or modification issued under this contract. The profit factors shall be as follows:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rate</th>
<th>Weight</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of Risk</td>
<td>20</td>
<td>See Item</td>
<td></td>
</tr>
<tr>
<td>Relative difficulty of work</td>
<td>15</td>
<td>b. below</td>
<td></td>
</tr>
<tr>
<td>Size of Job</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Period of performance</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor's investment</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assistance by Government</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subcontracting</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Based on the circumstances of each procurement action, each of the above factors shall be weighted from .03 to .12 as indicated below. The value shall be obtained by multiplying the rate by the weight. The value column when totaled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

(1) Degree of Risk. Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.
(2) Relative Difficulty of Work. If the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

(3) Size of Job. All work not in excess of $100,000 shall be weighted at .12. Work estimated between $100,000 and $5,000,000 shall be proportionately weighted from .12 to .05.

(4) Periods of Performance. Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight where additional time not required.

(5) Contractor's Investment. To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

(6) Assistance by Government. To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government-owned property, equipment and facilities, and expediting assistance.

(7) Subcontracting. To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.29 EXTENDED OVERHEAD

Extended overhead is defined as and shall include field office costs for all personnel, to include but not be limited to, the project superintendent, quality control personnel, and clerical persons, all plant, all utilities, and all supplies which are related to and incurred on a time basis. The unit price inserted in the Bidding Schedule shall be used in determining the amount to be applied to change orders or modifications for field overhead. Personnel, plant, utilities, and supplies referenced above shall not be bid or charged as direct costs on change orders and modifications. Further, the unit price stated shall be applied for each day the contract is extended, excluding time extensions granted under the GENERAL CONDITIONS (CONTRACT CLAUSES) clause entitled: "Default (Fixed-Price Construction)" and that this unit price represents the total amount to be applied for all field overhead including all subcontractors. The percentage used in Item No. 4 of the Bidding Schedule is for evaluation purposes only and shall not be construed as a limitation or a guarantee of the number of days that may be granted under the contract.

1.30 OVERHEAD

Overhead is defined as all overhead costs other than extended overhead costs. Examples include but are not limited to general and administrative home office costs and non-time related field office costs. The percentage for overhead inserted in the Bidding Schedule shall be used in determining the amount to be applied to all change orders or modifications. Further, the stated percentage, when applied to direct costs, represents the total
amount of overhead payable including any and all subcontractors. The percentage used in Item No. 3 of the Bidding Schedule is for evaluation purposes only and shall not be construed as a limitation or a guarantee of the amount of change orders or modifications that may be issued under the contract.

1.31 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES

It is the position of the Department of Defense that the Davis-Bacon Act, 40 U.S.C. 276a is applicable to temporary facilities such as job headquarters, tool yards, batch plants, borrow pits, sandpits, rock quarries, and similar operations, provided they are dedicated exclusively, or nearly so, to performance of the contract or project, and provided they are adjacent or virtually adjacent to the site of the work and are established after receipt of the proposal or bid. Clause "Payrolls and Basic Records" of the GENERAL CONDITIONS (CONTRACT CLAUSES) is applicable to such operations.

1.32 DRAWING SCALES

All scales shown on the RFP project drawings are based on a standard drawing size of 22" x 34". If any other size drawings are furnished or plotted, the contractor shall adjust the scales accordingly. The Contractor shall also advise his sub-contractors of the above.

1.33 WAGE RATE APPLICATION

1.33.1 Building Schedule

Applicable to all building construction and work up to 5 feet outside of the building.

1.33.2 Heavy Schedule

Applicable to all work not properly classified as either building, highway or residential.

1.34 FEDERAL HOLIDAYS

The following Federal legal holidays are observed by this installation:

<table>
<thead>
<tr>
<th>Holiday</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Year's Day</td>
<td>1 January</td>
</tr>
<tr>
<td>Martin Luther King's Birthday</td>
<td>Third Monday in January</td>
</tr>
<tr>
<td>President's Day</td>
<td>Third Monday in February</td>
</tr>
<tr>
<td>Memorial Day</td>
<td>Last Monday in May</td>
</tr>
<tr>
<td>Independence Day</td>
<td>4 July</td>
</tr>
<tr>
<td>Labor Day</td>
<td>First Monday in September</td>
</tr>
<tr>
<td>Columbus Day</td>
<td>Second Monday in October</td>
</tr>
<tr>
<td>Veterans Day</td>
<td>11 November</td>
</tr>
<tr>
<td>Thanksgiving Day</td>
<td>Fourth Thursday in November</td>
</tr>
<tr>
<td>Christmas Day</td>
<td>25 December</td>
</tr>
</tbody>
</table>

If a wage determination applies the number of holidays specified on it, it has priority over this requirement.

1.35 BASE HOURS

Base operation hours are 6:00 a.m. to 6:00 p.m. daily (Monday through Friday), excluding federal holidays. Access to the base during other times
must be requested in writing from the Contracting Officer and will be granted only for extenuating circumstances. Federal Holidays and weekends are considered as scheduled non-workdays.

1.36 APPLICATION OF "VALUE ENGINEERING" CLAUSE

GENERAL CONDITIONS (CONTRACT CLAUSES) clause "Value Engineering" is only applicable to changes to prescriptive RFP criteria requirements approved by the Contracting Officer, where there are cost savings to the Government. Any other changes, resulting in cost savings, which meet or exceed the requirements of the RFP, are not applicable to the Value Engineering clause.

1.37 GPS SURVEY OF AS-BUILT UTILITY LINES/POINTS

All new underground utility lines (including electrical power and communications, gas, water, sanitary sewer, storm drains, roof drains, and culverts) shall be located during installation using Global Positioning Satellite (GPS) surveying equipment. See Section 01 78 39.00 24 AS-BUILT DRAWINGS for additional information.

1.38 USACE BIM PROJECT EXECUTION PLAN (USACE PxP) TEMPLATE

The Contractor is required to submit a completed copy of the latest version of the USACE BIM PROJECT EXECUTION PLAN (USACE PxP) Template for this project to the CAD BIM Manager of the Omaha District for approval. See Attachment A to Section 01 78 39.00 24 AS-BUILT DRAWINGS.

This section defines basic project reference information and BIM related project milestones.

1. FACILITY OWNER: [U.S. ARMY] [U.S. AIR FORCE]
2. PROJECT NAME: [Family Life Center]
3. PROJECT LOCATION: [Fort Hood, TX]
4. CONTRACT TYPE: DESIGN-BUILD
5. FACILITY TYPE: [CoS Religious Facility - Family Life Center]
6. BRIEF PROJECT DESCRIPTION: [Family Life Center 17000 GSF, Activity Center 10000 GSF]
7. ADDITIONAL PROJECT INFORMATION: [Family Life Center with Non-Standard Design Activity Center]
8. PROJECT NUMBERS:

<table>
<thead>
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<tr>
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</table>

9. CADD BIM MANAGER: [ROGER FUJAN]
1.39 Contractor Manpower Reporting

The contractor shall report ALL contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the U.S. Army Corps of Engineers, Omaha District (Requiring Activity's identification Code (UIC): W07106) via a secure data collection site. The contractor is required to completely fill in all required data fields using the following web address: http://www.ecmra.mil/<http://www.ecmra.mil/>

Reporting inputs will be for the labor executed during the period of performance during each Government fiscal year (FY), which runs October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported no later than October 31 of each calendar year, beginning with 2013. Contractors may direct questions to the help desk at help desk at: http://www.ecmra.mil/

PART 2 NOT USED

PART 3 NOT USED
-- End of Section --
U.S. AIR FORCE MCP PROJECTS
PROJECT SIGN DETAILS
NO SCALE

SCHEDULE

<table>
<thead>
<tr>
<th>SPACE</th>
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<tr>
<td>A</td>
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<tr>
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<td>3/16&quot;</td>
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<tr>
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<td>3/16&quot;</td>
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<tr>
<td>D</td>
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</table>

NOTES:
1. POSTS SHALL BE S4S.
2. PLYWOOD SHALL BE EXTERIOR TYPE, A-C GRADE.
3. BEFORE PAINTING, SURFACE SHALL BE CLEAN, DRY, FREE OF GREASE AND SANDED.
4. PAINT WITH ONE EXTERIOR OIL PRIME COAT AND TWO COATS EXTERIOR TYPE ALKYD, CONFORMING TO MASTER PAINTERS INSTITUTE MPI-9, MPI GLOSS LEVEL 6. COLOR SHALL MATCH EITHER BENJAMIN MOORE CARIBBEAN AZURE (2050-20) OR PITTSBURGH PAINTS WARM WASSAIL (428-7) AS DIRECTED BY THE CONTRACTING OFFICER’S REPRESENTATIVE.
5. ALL LETTERING SHALL BE EXTERIOR TYPE ALKYD. COLOR SHALL BE WHITE.
6. DECALOMANIA FOR CORPS OF ENGINEERS INSIGNIA AND U.S. AIR FORCE EMBLEM WILL BE FURNISHED BY THE CONTRACTING OFFICER FOR INSTALLATION BY THE CONTRACTOR.
7. ALL EXPOSED WOOD (POSTS, SUPPORTS, BACK, ETC.) SHALL BE PAINTED THE SAME BACKGROUND COLOR AS THE SIGN.
8. LETTERING STYLE SHALL BE EITHER HELIOS EXTRA BOLD CONDENSED, HELIOS BOLD II, HELVETICA BLACK ROMAN, OR HELVETICA BOLD ROMAN.
This page was intentionally left blank for duplex printing.
General Decision Number: CO170012 07/21/2017  CO12

Superseded General Decision Number: CO20160012

State: Colorado

Construction Type: Heavy


HEAVY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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<thead>
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<th>Publication Date</th>
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<td>01/20/2017</td>
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<td>06/02/2017</td>
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<tr>
<td>7</td>
<td>06/09/2017</td>
</tr>
<tr>
<td>8</td>
<td>07/21/2017</td>
</tr>
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</table>
### Asbestos Workers/Insulator

(Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)

<table>
<thead>
<tr>
<th>Rates</th>
<th>Fringes</th>
</tr>
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<tbody>
<tr>
<td>$29.73</td>
<td>13.93</td>
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### ADAMS, ARAPAHOE, BOULDER, BROOKFIELD, DENVER, DOUGLAS AND JEFFERSON COUNTIES

### Rates

**BRICKLAYER**

<table>
<thead>
<tr>
<th>Rates</th>
<th>Fringes</th>
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</thead>
<tbody>
<tr>
<td>$26.62</td>
<td>7.99</td>
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### EL PASO AND PUEBLO COUNTIES

### Rates

**BRICKLAYER**

<table>
<thead>
<tr>
<th>Rates</th>
<th>Fringes</th>
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<tbody>
<tr>
<td>$25.32</td>
<td>9.90</td>
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### PUEBLO COUNTY

### Rates

**ELECTRICIAN**

- Electrical contract over $1,000,000
<table>
<thead>
<tr>
<th>Rates</th>
<th>Fringes</th>
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</thead>
<tbody>
<tr>
<td>$28.00</td>
<td>11.00+3%</td>
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- Electrical contract under $1,000,000
<table>
<thead>
<tr>
<th>Rates</th>
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</thead>
<tbody>
<tr>
<td>$24.85</td>
<td>11.00+3%</td>
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</tbody>
</table>

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### ADAMS, ARAPAHOE, BOULDER, BROOKFIELD, DENVER, DOUGLAS, JEFFERSON, LARIMER, AND WELD COUNTIES

### Rates

**ELECTRICIAN**

<table>
<thead>
<tr>
<th>Rates</th>
<th>Fringes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$34.70</td>
<td>14.97</td>
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### Line Construction:

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<thead>
<tr>
<th>Job Title</th>
<th>Rate</th>
<th>Fringes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundman</td>
<td>$24.87</td>
<td>22.25%</td>
</tr>
<tr>
<td>Line Equipment Operator</td>
<td>$30.36</td>
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</tr>
<tr>
<td>Lineman and Welder</td>
<td>$43.51</td>
<td>25.25%</td>
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</table>

EL PASO COUNTY

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Rate</th>
<th>Fringes</th>
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<tbody>
<tr>
<td>ELECTRICIAN</td>
<td>$31.00</td>
<td>15.38%</td>
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MESA COUNTY

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Rate</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ELECTRICIAN</td>
<td>$24.00</td>
<td>7.92%</td>
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</table>

<table>
<thead>
<tr>
<th>Job Title</th>
<th>Rate</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Power equipment operators:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blade: Finish</td>
<td>$27.92</td>
<td>10.10%</td>
</tr>
<tr>
<td>Blade: Rough</td>
<td>$27.60</td>
<td>10.10%</td>
</tr>
<tr>
<td>Bulldozer</td>
<td>$27.60</td>
<td>10.10%</td>
</tr>
<tr>
<td>Cranes: 50 tons and under</td>
<td>$27.75</td>
<td>10.10%</td>
</tr>
<tr>
<td>Cranes: 51 to 90 tons</td>
<td>$27.92</td>
<td>10.10%</td>
</tr>
<tr>
<td>Cranes: 91 to 140 tons</td>
<td>$28.55</td>
<td>10.10%</td>
</tr>
<tr>
<td>Cranes: 141 tons and over</td>
<td>$29.82</td>
<td>10.10%</td>
</tr>
<tr>
<td>Forklift</td>
<td>$27.22</td>
<td>10.10%</td>
</tr>
<tr>
<td>Mechanic</td>
<td>$28.08</td>
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<tr>
<td>Oiler</td>
<td>$26.84</td>
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<tr>
<td>Scraper: Single bowl, under 40 cubic yards</td>
<td>$27.75</td>
<td>10.10%</td>
</tr>
<tr>
<td>Scraper: Single bowl, including pups 40 cubic yards and over and tandem bowls</td>
<td>$27.92</td>
<td>10.10%</td>
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<tr>
<td>Trackhoe</td>
<td>$27.75</td>
<td>10.10%</td>
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IRON0024-003 05/01/2017

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Ironworkers</td>
<td>$26.30</td>
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<tr>
<td>Structural</td>
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LABO00086-001 05/01/2009

<table>
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<tbody>
<tr>
<td>Laborers: Pipelayer</td>
<td>$18.68</td>
<td>6.78%</td>
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<tr>
<td>Date</td>
<td>Rates</td>
<td>Fringes</td>
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<tr>
<td>--------------</td>
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<tr>
<td><strong>PLUM0003-005 06/01/2017</strong></td>
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<tr>
<td><strong>PLUMBER</strong></td>
<td>$39.08</td>
<td>16.44</td>
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<td><strong>EL PASO COUNTY</strong></td>
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<td><strong>Plumbers and Pipefitters</strong></td>
<td>$36.50</td>
<td>14.10</td>
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<tr>
<td><strong>PUEBLO COUNTY</strong></td>
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<tr>
<td><strong>Plumbers and Pipefitters</strong></td>
<td>$36.50</td>
<td>14.10</td>
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<tr>
<td><strong>MESA COUNTY</strong></td>
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<tr>
<td><strong>Plumbers and Pipefitters</strong></td>
<td>$35.17</td>
<td>11.70</td>
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<tr>
<td><strong>PIPEFITTER</strong></td>
<td>$37.10</td>
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<tr>
<td><strong>Sheet metal worker</strong></td>
<td>$33.26</td>
<td>16.61</td>
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<td><strong>Truck drivers:</strong></td>
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<tr>
<td>Pickup</td>
<td>$20.16</td>
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<tr>
<td>Tandem/Semi and Water</td>
<td>$20.79</td>
<td>4.02</td>
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Rates

Boilermaker...$ 17.60

Carpenters:
  Form Building and Setting...$ 16.97  2.74
  All Other Work..............$ 15.14  3.37

Cement Mason/Concrete Finisher...$ 17.31  2.85

Ironworker, Reinforcing........$ 18.83  3.90

Laborers:
  Common......................$ 11.22  2.92
  Flagger.....................$  8.91  3.80
  Landscape...................$ 12.56  3.21

Painters:
  Brush, Roller & Spray.......$ 15.81  3.26

Power equipment operators:
  Backhoe.....................$ 16.36  2.48
  Front End Loader............$ 17.24  3.23
  Skid Loader................$ 15.37  4.41

Fringes

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).
The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

**Union Rate Identifiers**

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

**Survey Rate Identifiers**

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

**Union Average Rate Identifiers**

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those
classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

----------------------------------------------------------------

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the
interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

    Administrative Review Board  
    U.S. Department of Labor  
    200 Constitution Avenue, N.W.  
    Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

================================================================

END OF GENERAL DECISION
General Decision Number: CO170026 08/04/2017  CO26

Superseded General Decision Number: CO20160026

State: Colorado

Construction Type: Building

County: Arapahoe County in Colorado.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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<td>Date</td>
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<tr>
<td>11/01/2016</td>
<td>CARPENTER (Acoustical Ceiling Installation and Drywall Hanging Only)</td>
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<td>06/01/2016</td>
<td>MILLWRIGHT</td>
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<td>06/01/2017</td>
<td>ELECTRICIAN (Excludes Low Voltage Wiring)</td>
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<tr>
<td>01/01/2017</td>
<td>ELEVATOR MECHANIC</td>
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**FOOTNOTE:**
- Vacation: 6%/under 5 years based on regular hourly rate for all hours worked. 8%/over 5 years based on regular hourly rate for all hours worked.
- PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Veterans' Day; Thanksgiving Day; the Friday after Thanksgiving Day; and Christmas Day.

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<tr>
<td></td>
<td>141 tons and over</td>
<td>$29.82</td>
</tr>
<tr>
<td></td>
<td>50 tons and under</td>
<td>$27.75</td>
</tr>
<tr>
<td></td>
<td>51 to 90 tons</td>
<td>$27.92</td>
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<td></td>
<td>91 to 140 tons</td>
<td>$28.55</td>
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<tr>
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<th>Rates</th>
<th>Fringes</th>
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<tbody>
<tr>
<td>05/01/2017</td>
<td>IRONWORKER, ORNAMENTAL</td>
<td>$26.30</td>
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CO170026 dated 08/04/2017
<table>
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<tr>
<th>Position</th>
<th>Rate</th>
<th>Fringe</th>
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<tbody>
<tr>
<td>IRONWORKER, STRUCTURAL</td>
<td>$26.30</td>
<td>12.25</td>
</tr>
<tr>
<td>PAINTER (Brush, Roller and Spray; Excludes Drywall Finishing/Taping)</td>
<td>$20.00</td>
<td>7.91</td>
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<tr>
<td>DRYWALL FINISHER/TAPER</td>
<td>$21.05</td>
<td>7.91</td>
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<tr>
<td>SOFT FLOOR LAYER (Vinyl and Carpet)</td>
<td>$20.00</td>
<td>10.83</td>
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<tr>
<td>* GLAZIER</td>
<td>$31.02</td>
<td>11.23</td>
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<td>PLUMBER (Excludes HVAC Duct, Pipe and Unit Installation)</td>
<td>$34.53</td>
<td>16.44</td>
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<td>PIPEFITTER (Includes HVAC Pipe and Unit Installation; Excludes HVAC Duct Installation)</td>
<td>$33.30</td>
<td>17.65</td>
</tr>
<tr>
<td>SPRINKLER FITTER (Fire Sprinklers)</td>
<td>$36.73</td>
<td>20.47</td>
</tr>
<tr>
<td>SHEET METAL WORKER (Includes</td>
<td></td>
<td></td>
</tr>
</tbody>
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CO170026 dated 08/04/2017
<table>
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<th>Craft Description</th>
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<th>Fringe</th>
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</thead>
<tbody>
<tr>
<td>HVAC Duct Installation; Excludes HVAC Pipe and Unit Installation</td>
<td>$33.26</td>
<td>16.61</td>
</tr>
<tr>
<td><strong>SUCO2013-002 07/31/2015</strong></td>
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<tr>
<td><strong>BRICKLAYER</strong></td>
<td>$21.96</td>
<td>0.00</td>
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<tr>
<td><strong>CARPENTER (Metal Stud Installation Only)</strong></td>
<td>$17.68</td>
<td>0.00</td>
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<td><strong>CARPENTER, Excludes Acoustical Ceiling Installation, Drywall Hanging, and Metal Stud Installation</strong></td>
<td>$23.83</td>
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<td><strong>CEMENT MASON/CONCRETE FINISHER</strong></td>
<td>$20.33</td>
<td>6.76</td>
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<td><strong>ELECTRICIAN (Low Voltage Wiring)</strong></td>
<td>$31.60</td>
<td>7.38</td>
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<tr>
<td><strong>INSULATOR - MECHANICAL (Duct, Pipe &amp; Mechanical System Insulation)</strong></td>
<td>$23.12</td>
<td>7.97</td>
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<tr>
<td><strong>LABORER: Common or General</strong></td>
<td>$15.21</td>
<td>4.54</td>
</tr>
<tr>
<td><strong>LABORER: Mason Tender - Brick</strong></td>
<td>$15.99</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>LABORER: Mason Tender - Cement/Concrete</strong></td>
<td>$16.00</td>
<td>0.00</td>
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<tr>
<td><strong>LABORER: Pipelayer</strong></td>
<td>$16.96</td>
<td>3.68</td>
</tr>
<tr>
<td><strong>OPERATOR: Backhoe/Excavator/Trackhoe</strong></td>
<td>$20.78</td>
<td>5.78</td>
</tr>
<tr>
<td><strong>OPERATOR: Bobcat/Skid Steer/Skid Loader</strong></td>
<td>$19.10</td>
<td>3.89</td>
</tr>
<tr>
<td><strong>OPERATOR: Grader/Blade</strong></td>
<td>$21.50</td>
<td>0.00</td>
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<tr>
<td><strong>ROOFER</strong></td>
<td>$16.96</td>
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</tr>
<tr>
<td><strong>TRUCK DRIVER: Dump Truck</strong></td>
<td>$17.34</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>WATERPROOFER</strong></td>
<td>$16.94</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CO170026 dated 08/04/2017
Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers
Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

----------------------------------------------------------------

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.)
and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

================================================================

END OF GENERAL DECISION
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Small Arms Range Complex - Buckley AFB, CO

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PART 1   GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AACE INTERNATIONAL (AACE)

AACE 29R-03 (2011) Forensic Schedule Analysis


U.S. ARMY CORPS OF ENGINEERS (USACE)


1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G, RO
Preliminary Project Schedule; G, RO
Initial Project Schedule; G, RO
Periodic Schedule Update; G, RO

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 2-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification and be a direct employee of the prime Contractor. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

PART 2   PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules
required herein must be capable of meeting all requirements of this specification.

2.1.1 Government Default Software

The Government intends to use Primavera P6.

2.1.2 Contractor Software

Scheduling software used by the contractor must be commercially available from the software vendor for purchase with vendor software support agreements available. The software routine used to create the required sdef file must be created and supported by the software manufacturer.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the "xer" export file in a version of P6 importable by the Government system.

2.1.2.2 Other Than Primavera

If the contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15, SCHEDULE FOR CONSTRUCTION CONTRACTS. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of design and construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Designers, Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM). The requirements in this section have a direct relationship to the reporting specified in Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM).

3.2 BASIS FOR PAYMENT AND COST LOADING

The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.

3.2.1 Activity Cost Loading

Activity cost loading must be reasonable and without front-end loading.
Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.

3.2.2 Withholdings / Payment Rejection

Failure to meet the requirements of this specification may result in the disapproval of the preliminary, initial or periodic schedule updates and subsequent rejection of payment requests until compliance is met.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount from each payment period until such revisions to the project schedule have been made.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.3.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.3 Design and Permit Activities

Include design and permit activities with the necessary conferences and follow-up actions and design package submission dates. Include the design schedule in the project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. Provide at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Also include review and correction periods associated with each item.

3.3.4 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.5 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).
b. Submission, review and acceptance of design packages.

c. Submission of mechanical/electrical/information systems layout drawings.

d. Long procurement activities

e. Submission and approval of O & M manuals.

f. Submission and approval of as-built drawings.

g. Submission and approval of DD1354 data and installed equipment lists.

h. Submission and approval of testing and air balance (TAB).

i. Submission of TAB specialist design review report.

j. Submission and approval of fire protection specialist.

k. Submission and approval of Building Commissioning Plan, test data, and reports: Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements. All tasks associated with all building testing and commissioning will be completed prior to submission of building commissioning report and subsequent contract completion.

l. Air and water balancing.

m. Building commissioning - Functional Performance Testing.

n. Controls testing plan submission.

o. Controls testing.

p. Performance Verification testing.

q. Other systems testing, if required.

r. Contractor's pre-final inspection.

s. Correction of punch list from Contractor's pre-final inspection.

t. Government's pre-final inspection.

u. Correction of punch list from Government's pre-final inspection.

v. Final inspection.

3.3.6 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: acceptance, design reviews, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.
3.3.7 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. All Activity Codes shall be developed and assigned to activities as detailed herein. A template SDEF compatible schedule backup file is available on the QCS web site: http://rms.usace.army.mil (CLICK FOR SITE MAP, Downloads).

The SDEF format is as follows:

<table>
<thead>
<tr>
<th>Field</th>
<th>Activity Code</th>
<th>Length</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WRKP</td>
<td>3</td>
<td>Workers per day</td>
</tr>
<tr>
<td>2</td>
<td>RESP</td>
<td>4</td>
<td>Responsible party</td>
</tr>
<tr>
<td>3</td>
<td>AREA</td>
<td>4</td>
<td>Area of work</td>
</tr>
<tr>
<td>4</td>
<td>MODF</td>
<td>6</td>
<td>Modification Number</td>
</tr>
<tr>
<td>5</td>
<td>BIDI</td>
<td>6</td>
<td>Bid Item (CLIN)</td>
</tr>
<tr>
<td>6</td>
<td>PHAS</td>
<td>2</td>
<td>Phase of work</td>
</tr>
<tr>
<td>7</td>
<td>CATW</td>
<td>1</td>
<td>Category of work</td>
</tr>
<tr>
<td>8</td>
<td>FOW</td>
<td>20</td>
<td>Feature of work*</td>
</tr>
</tbody>
</table>

*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.

3.3.7.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities, if directed by the Contracting Officer. Workers per day shall be the average number of workers expected each day to perform a task for the duration of that activity.

3.3.7.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities cannot have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record);
3.3.7.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings.

Activities cannot have more than one Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.3.7.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.3.7.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.3.7.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are design phase, procurement phase, and construction phase. Each activity can have only one Phase of Work code.

a. Code proposed fast track design and construction phases proposed to allow filtering and organizing the schedule by fast track design and construction packages.

b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.3.7.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to design, design submittal, design reviews, review conferences, permits, construction submittals, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.3.7.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.
Definable Feature of Work is defined in Section 01 45 00.00 10 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.8 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.3.8.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.

3.3.8.2 End Project Finish Milestone and Constraint

The last activity in the schedule shall be a finish milestone titled "End Project."

The project schedule must be constrained to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.3.8.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.3.8.3.1 Start Phase

Use a start milestone as the first activity for a project phase. The start milestone shall be called "Start Phase X" where "X" refers to the phase of work.

3.3.8.3.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.3.9 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Government Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop
Seasonal Calendar(s) and assign to seasonally affected activities as applicable.

If an activity is weather sensitive it should be assigned to a calendar showing non-work days on a monthly basis, with the non-work days selected at random across the weeks of the calendar, using the anticipated days provided in the contract clause TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. The assignment of the non-work days should be over a seven-day week since weather records are compiled on seven-day weeks, which will cause some of the weather related non-work days to fall on weekends.

3.3.10 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Acknowledged" must have no predecessor logic, and the last activity -"End Project" must have no successor logic.

Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

3.3.11 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.3.12 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report and in the periodic schedule update meetings.

3.3.13 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.14 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.3.15 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially
absorb float, or to replace proper schedule logic.

a. Leads (negative lags) are prohibited.

b. Start to Finish (SF) relationships are prohibited.

3.3.16 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequence progress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are not be allowed.

3.3.17 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

3.3.18 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3.19 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Government pre-final inspection" activity(ies) not less than 1 percent of the present contract value. Activity(ies) may be declared 100 percent complete upon the Government's verification of completion and correction of all punch list work identified during Government pre-final inspection(s).

3.3.19.1 As-Built Drawings

If there is no separate contract line item (CLIN) for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not less than $35,000 or 1 percent of the present contract value, which ever is greater, up to $200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.19.2 O & M Manuals

Cost load the "Submission and approval of O & M manuals" activity not less than $20,000. Activity will be declared 100 percent complete upon the Government's approval of all O & M manuals.

3.3.20 Anticipated Adverse Weather

Paragraph applicable to contracts with clause entitled TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Reflect the number of anticipated adverse weather delays allocated to a weather sensitive activity in the activity's calendar.
3.3.21 Early Completion Schedule and the Right to Finish Early

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

a. No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.

b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD/DVD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.4.1 Preliminary Project Schedule Submission

Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (POW).

3.4.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. Include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design
submission, reviews and conferences; permit submissions and any required Government actions; and long lead item acquisition prior to design completion. Also cover in the preliminary design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. Constrain construction activities by Government acceptance of associated designs. When the design is complete, incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur after the dry-in milestone. If applicable, include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences, permit submissions and any required Government actions, and long lead item acquisition prior to design completion. Also cover in the preliminary design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities. No payment will be made for work items not fully detailed in the Project Schedule.

3.4.2.1 Design Package Schedule Submission

With each design package submitted to the Government, submit a fragment schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package including construction, procurement and permitting activities.

3.4.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in the paragraph PERIODIC SCHEDULE UPDATE MEETINGS. These updates will enable the Government to assess Contractor’s progress. Update the schedule to include detailed construction activities as the design progresses, but not later than the submission of the final un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission if such activity is authorized.

a. Updated information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting.

b. AS and AF dates must match the date(s) reported on the Contractor’s Quality Control Report for an activity start or finish.

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:
3.5.1 Data CD/DVDs

Provide two sets of data CD/DVDs containing the current project schedule and all previously submitted schedules in the format of the scheduling software (e.g. .xer). Also include on the data CD/DVDs the Narrative Report and all required Schedule Reports. Label each CD/DVD indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.5.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

a. Identify and discuss the work scheduled to start in the next update period.

b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.

c. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.

d. Identify and explain why activities based on their calculated late dates should have either started or finished during the update period but did not.

e. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. This should include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

f. Identify and discuss out-of-sequence work.

3.5.3 Schedule Reports

The format, filtering, organizing and sorting for each schedule report must be as directed by the Contracting Officer. Typically, reports shall contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. Provide one set of hard copy reports upon request of the Contracting Officer Representative. The following lists typical reports that will be requested:

3.5.3.1 Activity Report

List of all activities sorted according to activity number.
3.5.3.2 Logic Report

List of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.3.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.3.4 Earnings Report by CLIN

A compilation of the Total Earnings on the project from the NTP to the data date. This report must reflect the earnings of activities based on the agreements made in the schedule update meeting defined herein. Provided a complete schedule update has been furnished, this report serves as the basis of determining progress payments. Group activities by CLIN number and sort by activity number. This report must also provide a total CLIN percent earned value, CLIN percent complete, and project percent complete. The printed report must contain the following for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Earnings to Date, Earnings this period, Total Quantity, Quantity to Date, and Percent Complete (based on cost).

3.5.3.5 Schedule Log

Provide a Scheduling/Leveling Report generated from the current project schedule being submitted.

3.5.4 Network Diagram

The Network Diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.4.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.4.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.4.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.5.4.4 Banding

Organize activities using the WBS or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group
activities by major elements of work, category of work, work area and/or responsibility.

3.5.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.6 PERIODIC SCHEDULE UPDATE

3.6.1 Periodic Schedule Update Meetings

Conduct periodic schedule update meetings for the purpose of reviewing the proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Conduct meetings at least monthly within five days of the proposed schedule data date. Provide a computer with the scheduling software loaded and a projector which allows all meeting participants to view the proposed schedule during the meeting. The Contractor's authorized scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Government. The meeting is a working interactive exchange which allows the Government and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The meeting will last no longer than 8 hours. Provide a draft of the proposed narrative report and schedule data file to the Government a minimum of two workdays in advance of the meeting. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. Superintendents, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work. Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the Government in the submission and invoice for payment.

3.6.2 Update Submission Following Progress Meeting

Submit the complete Periodic Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 work days after the periodic schedule update meeting.

3.7 WEEKLY PROGRESS MEETINGS

Conduct a weekly meeting with the Government (or as otherwise mutually agreed to) between the meetings described in paragraph entitled PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.

3.8 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.
3.8.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Multiple impacts must be evaluated chronologically; each with its own justification of delay. With multiple impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

3.8.2 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes will be incorporated into the schedule being used to justify the time impact.

3.8.3 Forensic Schedule Analysis (Retrospective Analysis)

Prepare an analysis for approval by the Contracting Officer based on industry standard AACE 29R-03.

3.8.4 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis. The proposed fragnet must consist of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.8.5 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.8.6 Impact to Early Completion Schedule

No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS unless the Contractor actually
performed work in accordance with that Early Completion Schedule. The Contractor must show that an early completion was achievable had it not been for the impact.

3.9 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

3.9.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.9.2 Failure to Perform

Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and/or may result in corrective action directed by the Contracting Officer pursuant to FAR 52.236-15 Schedules for Construction Contracts, FAR 52.249-10 Default (Fixed-Price Construction), and other contract provisions.

3.9.3 Recovery Schedule

Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to FAR 52.236-15 Schedules for Construction Contracts.

3.10 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.11 TRANSFER OF SCHEDULE DATA INTO RMS CM

Import the schedule data into the Resident Management System Contractor Mode (RMS CM) and export the RMS CM data to the Government. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 - Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and
approvable hard copies and matching electronic export from RMS CM of the application for progress payment.

3.12 PRIMAVERA P6 MANDATORY REQUIREMENTS

If Primavera P6 is being used, request a backup file template (.xer) from the Government, if one is available, prior to building the schedule. The following settings are mandatory and required in all schedule submissions to the Government:

a. Activity Codes must be Project Level, not Global or EPS level.

b. Calendars must be Project Level, not Global or Resource level.

c. Activity Duration Types must be set to "Fixed Duration & Units".

d. Percent Complete Types must be set to "Physical".

e. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Set Calendar Work Hours/Day to 8.0 Hour days.

f. Set Schedule Option for defining Critical Activities to "Longest Path".

g. Set Schedule Option for defining progressed activities to "Retained Logic".

h. Set up cost loading using a single lump sum resource. The Price/Unit must be $1/hr, Default Units/Time must be "8h/d", and settings "Auto Compute Actuals" and "Calculate costs from units" selected.

i. Activity ID's must not exceed 10 characters.

j. Activity Names must have the most defining and detailed description within the first 30 characters.

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PART 1   GENERAL

Attachments: Submittal Register
ENG Form 4025, Transmittal Form

1.1 SUMMARY

The Contractor is responsible for total management of his work including approval, scheduling, control, certification of all submittals and compliance with all applicable Buy-American Act and Trade Agreement Act clauses. The submittal management system provided in these specifications is intended to be a complete system for the Contractor to use to control the quality of materials, equipment and workmanship provided by manufacturers, fabricators, suppliers and subcontractors. Review each submittal for contract compliance. This review is based on the construction drawings and specifications. Compliance with all applicable Buy American Act and Trade Agreement Clauses is to be included in this review. The Contractor must provide the country of origin on ENG Form 4025 for each item submitted. The Submittal Register (ENG Form 4288) will be utilized to log and monitor all submittal activities. No construction or installation activities are to be performed until required approvals and Government compliance reviews of applicable submittals have been made. Check to assure that all materials and/or equipment have been tested, submitted and approved during the preparatory phase of quality control inspections. Coordinate all submittals with the Contractor's Designer of Record (A-E). Approval by the Contractor's Designer means that the submittal is in compliance with the Construction Set design submittal.

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Contractor's Quality Control (CQC) System Manager and the Designer of Record, if applicable, shall check and approve all items prior to submittal; and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals.

This section includes administrative and procedural requirements for construction submittals presented by the Contractor after the construction set plans and specifications have been accepted by the government. This section also includes requirements for developing, submitting and
maintaining a "Submittal Register".

Submittals requiring Government approval are to be scheduled and made prior to the acquisition of the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to start of construction (work) or the start of the next major phase of the construction on a multi-phase contract, includes schedules, tabular list of data, or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work. Unless otherwise designated, the submittals listed below will be handled as Administrative Submittals.

Certificates of insurance
Surety bonds
List of proposed Subcontractors
List of proposed products
Construction Progress Schedule
Network Analysis Schedule (NAS)
Submittal register
Schedule of prices
Health and safety plan
Work plan
Quality Control (QC) plan
Permits
Environmental protection plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the
product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuing work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

Design submittals, design substantiation submittals and extensions of design submittals.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports.

Daily logs and checklists.
Final acceptance test and operational test procedure.

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

Text of posted operating instructions.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (MSDS) concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and must state the test results; and indicate whether the material, product, or system has passed or failed the test.

Factory test reports.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Special requirements necessary to properly close out a construction contract. For example, Record Drawings, special warranties, posted operating instructions, training plan and as-built drawings. Also,
submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

Interim "DD Form 1354" with cost breakout for all assets 30 days prior to facility turnover.

1.2.2 Approving Authority

Office or designated person authorized to approve submittal.

1.2.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, except those SD-01 Pre-Construction Submittals noted above, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2.4 Administrative Submittals

The Government reserves the right to handle the following submittals (listed below) as administrative submittals via a Serial Letter as directed by the Area or Resident Office. When directed by the Area or Resident Office (as directed), administrative submittals are submitted for acceptance by the Government. Format for the Serial Letter is as directed by the Area or Resident Office. Submit three (3) copies of administrative submittal items, unless directed otherwise. Administrative submittals may include the following submittals: Submittal Register (this section), Quality Control Plans (Section 01 45 00.00 10 QUALITY CONTROL, Accident Prevention Plans (Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS), Revisions to Environmental Protection Plans (Section 01 57 20.00 10 ENVIRONMENTAL PROTECTION) and other submittals as directed by the Contracting Officer.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The Government may elect to handle this submittal as an administrative submittal as outlined above. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G-RO

1.4 ELECTRONIC SUBMITTALS

Electronic format will be utilized for submission of construction submittal items required by the specifications, including ENG Form 4025 Transmittal Form, with exceptions noted below.

1.4.1 Exceptions

Submit all SD-04 (Samples) submittals and other submittals, where noted in the specifications to be in physical, hard-copy form. Number of hard copies shall be as required in the "SUBMITTAL ITEM PROCEDURES" paragraph below.
1.4.2 File Format

Electronic submittals may be submitted by any means readily accessible to
the Government including, but not limited to, the following:

a. E-mails with text and all attachments less than or equal to 14MB in
size. The Government IT system does not currently support e-mail
transmissions of greater than 14MB. Should this e-mail transmission
size limitation change during the course of the Contract, larger e-mail
transmissions may become acceptable, but no time extensions will be
granted for transmission errors resulting from oversized email
attachments.

b. Internet Secure File Transfer Protocol (FTP) systems compatible
with Government IT systems.

c. Mailed CD-ROM or DVD-ROM media.

d. Contractor-funded file sharing website compatible with Government
IT systems.

e. Any other secure, Government-approved means of transmitting digital
media.

Means of transfer must provide documents freely accessible to the
Government. If the means of transfer is by e-mail, FTP repository, or
similar, files shall be capable of being downloaded without errors or
disruption. Regardless of the method of transfer, the files shall be able
to be archived on Government IT systems without error or restriction.

Once provided, all submittal documents shall become Government property.
ZIP-file or similar archives requiring a password for access to the archive
are permissible provided the password for the archive is static, permanent,
not use-limited, and provided to the Government at the time of
transmission. Any individual files provided electronically to the
Government in 'SECURED' format, password-protected, or utilizing any other
such method of file restriction shall be deemed defective and returned to
the Contractor for correction. Regardless of errors encountered during the
electronic submittal process the Contractor shall be responsible for delays
resulting from the inadequacy of media delivery method, file-formatting, or
file restriction issues. No time extensions will be granted for delays
resulting from improper file formatting, file restrictions, or inadequate
file transfer methods.

Discussion and decisions on a consistent Means of transfer throughout the
duration of the project will be made at the pre-construction conference.
The format of electronic submittals is Adobe Acrobat Portable Document
Format (PDF), compatible with Adobe X, unless agreed to and directed
otherwise by the Contacting Officer's Representative. For As-built
drawings, see Section 01 78 39.00 24 AS-BUILT DRAWINGS.

1.4.3 Digital File Naming

Label and name electronic files delivered to the Government in a manner
that is logical and consistent throughout the duration of the project. A
file naming convention that clearly indicates the transmittal number,
component of submittal, and revision number associated with the submittal
will be discussed and confirmed at the pre-construction kickoff conference.

1.4.4 Content

Submit one (1) set of readily copied and legible electronic documents and
associated matching ENG Form 4025 Transmittal Form. Duplicate copies of
electronic submittals are not desired. Content and format of the electronic submittal shall conform to all requirements listed herein. Delivery methods of both electronic and hard-copy submittals shall remain consistent throughout the duration of the Contract, in compliance with Contract specifications.

1.4.5 Delivery

Delivery of submittals will be similar to those described in the "SUBMITTAL ITEM PROCEDURES" paragraph below. Notifications of file transfers will be sent to the Government recipients listed below. The means of contact and notification by mail or email will be coordinated and confirmed at the pre-construction conference.

1.5 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

Unless directed otherwise, the words "Government Approval" associated with "G" designated submittals are interpreted in the context of the below defined submittal types. Submittal Reviewers include the following:

DO - District Office
AE - Architect Engineer
CR - Government Conformance Review
DA - Designer of Record
AO - Area Office or other designated Government Office
RO - Resident Office

1.5.1 Designer of Record Approved (DA)

Designer of Record (DOR) approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings." Contractor to provide the Government with the number of copies designated hereinafter of all DOR approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation, Accepted Proposal and the completed design. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below. Design submittals to be in accordance with Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.5.2 Government Approved G

Government approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.5.3 Government Conformance Review of Design (CR)

The Government will review all intermediate and final design submittals for conformance with the technical requirements of the solicitation. Section
01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES covers the design submittal and review process in detail. Review will be only for conformance with the applicable codes, standards and contract requirements. Design data includes the design documents described in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES. Generally, design submittals should be identified as SD-05 Design Data submittals.

1.5.4 Designer of Record Approved/Government Conformance Review (DA/CR)

1.5.4.1 Deviations to the Accepted Design

Designer of Record approval and the Government's concurrence are required for design work performed by the Construction Contractor not previously included in the accepted completed design documents (i.e. Fire Suppression and Detection Systems and HVAC Controls) and any proposed deviation from the accepted design which still complies with the contract before the Contractor is authorized to proceed with material acquisition or installation. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction", they are considered to be "shop drawings." If necessary to facilitate the project schedule, the Contractor and the DOR may discuss a submittal proposing a deviation with the Contracting Officer's Representative prior to officially submitting it to the Government. However, the Government reserves the right to review the submittal before providing an opinion, if deemed necessary. In any case, the Government will not formally agree to or provide a preliminary opinion on any deviation without the DOR's approval or recommended approval. The Government reserves the right to non-concur with any deviation from the design, which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and concurred design.

1.5.4.2 Substitutions

Unless prohibited or provided for otherwise elsewhere in the Contract, where the accepted contract proposal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, and the Contractor desires to substitute manufacturer or model after award, submit a requested substitution for Government concurrence. Include substantiation, identifying information and the DOR's approval, as meeting the contract requirements and that it is equal in function, performance, quality and salient features to that in the accepted contract proposal. If the Contract otherwise prohibits substitutions of equal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, the request is considered a "variation" to the contract. Variations are discussed below in paragraphs: "Designer of Record Approved/Government Approved" and "VARIATIONS"

1.5.4.3 Construction Submittals

Designer of Record approval and the Government's concurrence (Area or Resident Office, as directed) are required for those submittals as directed by the Government. These submittals are to be reviewed and approved by the Contractor's Quality Control Representative and the Contractor's Designer prior to submittal to the Government. Conformance review only checks for compliance with the RFP solicitation requirements. Conformance review of submittals or lack thereof by the Government does not relieve the Contractor of its responsibility for the design and construction. Typical
submittals are listed below.

· All Testing, Adjusting, and Balancing (TAB) submittals
· All System type testing procedures and acceptance reports (e.g., Fire Detection, Fire Protection, Security/Communication Systems, etc.)
· All O&M Manuals
· Other final operational type submittals such as Spare Parts Data, Framed Instructions, Warranty Information, etc.
· Training plans and schedules for Systems Training

1.5.5 Designer of Record Approved/Government Approved (DA/GA)

In addition to the above stated requirements for proposed deviations to the accepted design, both Designer of Record and Government Approval and, where applicable, a contract modification are required before the Contractor is authorized to proceed with material acquisition or installation for any proposed variation to the contract (the solicitation and/or the accepted proposal), which constitutes a change to the contract terms. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings." The Government reserves the right to accept or reject any such proposed deviation at its discretion.

1.5.6 Information Only

For Design-build construction all submittals not requiring Designer of Record or Government approval will be for information only. All information only submittals are to be reviewed and approved by the Contractor's Quality Control Representative and the Contractor's Designer prior to submittal to the Government. The Contracting Officer has the option to review any submittal but these submittals do not require conformance review by the Government. Listed below are typical examples of FIO submittals. This list is not all inclusive of all FIO submittals.

1. Structural steel
2. Lawn irrigation systems
3. Concrete reinforcement
4. Millwork/casework
5. Masonry reinforcement
6. Interior signage
7. Cathodic protection
8. Asbestos abatement layouts
9. Security systems
10. Interior / Exterior Finishes
11. Furniture Systems
12. Pavement Concrete mix designs (special use - non routine, e.g., Airfield Paving)
13. Asphalt mix designs (special use - non routine, e.g., Airfield Paving)
14. Finish samples for major finishes

They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.6 PREPARATION

1.6.1 Transmittal Form

Use the attached sample transmittal form (ENG Form 4025) for submitting all
submitting submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.7 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. For design-build construction the Government will retain 2 copies of information only submittals.

1.8 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.8.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.8.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

Check the column "variation" of ENG Form 4025 for submittals which include proposed deviations requested by the Contractor. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

If revisions to the accepted design (Construction Set) become necessary,
submit a supplemental design package using the "Supplemental Design Certification and Transmittal Form" that was included in the Request For Proposal, Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES. The revisions will be considered a "Variation" and the list of deviations from the accepted design shall be outlined on the Design Certification form. Variations from the Construction Set must be approved by the Contractor's Designer, and Contractor's Quality Control Representative and accepted by the Contracting Officer. The supplemental design submittal must include drawings, specifications, design analysis and calculations necessary to establish that the proposed revision satisfies the contract requirements.

1.8.3 Warranting That Variations Are Compatible

When delivering a variation for approval, Contractor, including its Designer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.8.4 Review Schedule Is Modified

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.9 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM). The Government will provide the initial submittal register in electronic format with the following fields completed, to the extent that will be required by the Government during subsequent usage.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

The Designer of Record shall develop a complete list of submittals during design and identify required submittals in the specifications, and use the list to prepare the Submittal Register. The list may not be all inclusive and additional submittals may be required by other parts of the contract.
The Contractor is required to complete the submittal register and submit it to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. Coordinate the submit dates and need dates with dates in the Contractor prepared progress schedule. Submit monthly or until all submittals have been satisfactorily completed, updates to the submittal register showing the Contractor action codes and actual dates with Government action codes. Revise the submittal register when the progress schedule is revised and submit both for approval.

1.9.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.9.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.9.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.
Column (q) List date returned to Contractor.

1.9.4 Contractor Action Code and Action Code

Entries for columns (j) and (o), are to be used are as follows (others may be prescribed by Transmittal Form):

- NR - Not Received
- AN - Approved as noted
- A - Approved
- RR - Disapproved, Revise, and Resubmit

1.9.5 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.10 SUBMITTAL ITEM PROCEDURES

1.10.1 Government Reviewed Design Construction Submittals

Except as noted below, all Government reviewed design construction hard copy submittals are to be submitted in three (3) copies. All three (3) copies are to be mailed directly to the addressee shown below using the transmittal form. Additionally, submit one (1) copy of the transmittal form to the Area Engineer or Resident Engineer (as directed). See paragraph: ELECTRONIC SUBMITTALS for submittal items being transmitted electronically.

Technical Reviewer

District Office (DO)
Russell Matthews
U.S. Army Corps of Engineers
Omaha District
Attn: CENWO-CD-S-TS
1616 Capitol Ave
Omaha, NE 68102-4901

Electronic Submittals and e-mail notifications of Electronic Submittals posted to AMRDEC SAFE or other FTP repositories should be sent to Russell Matthews at the following e-mail address:
CENWO.ConstructionSubmittal@usace.army.mil

Items not to be submitted in multiples, such as samples and test cylinders, are to be submitted to the Area or Resident Engineer (as directed), accompanied by three (3) copies of the transmittal form.

Hard Copy Drawings: Submit each required submittal, which is in the form of a drawing, as three (3) prints of the drawing. Drawing prints are to be either blue or black line permanent-type prints on a white background or blueprint and shall be sufficiently clear and suitable for making legible copies.
All hard copy submittals must be presented such that they fit into a standard size (letter) cabinet file drawer. Larger drawings must be folded to fit and not rolled. See paragraph: ELECTRONIC SUBMITTALS above for electronic submittals.

Catalog cuts and other descriptive data which have more than one model, size, or type or which shows optional equipment must be clearly marked to show the model, size, or type and all optional equipment which is provided. Submittals on component items forming a system or that are interrelated are to be submitted at one time as a single submittal in order to demonstrate that the items have been properly coordinated and will function as a unit.

For hard copy submittals, submit an additional copy of all submittals related to fire protection/detection systems concurrently to the Base Civil Engineering or Post DPW Office. The mailing address for these submittals will be obtained at the preconstruction conference. For electronic submittals, the means of transfer will be discussed at the Pre-Construction Conference.

For hard copy submittals, submit an additional copy of all designated Commissioning Authority (CxA) submittals related to enhanced commissioning concurrently to the CxA. The mailing address for these submittals will be provided at the preconstruction conference. For electronic submittals, the means of transfer will be discussed at the Pre-Construction Conference.

1.10.2 Government Reviewed Construction, Government Approved (G-AO/G-RO) and FIO Submittals

Except as noted below, data for all Government Reviewed Construction and Government Approved submittal items are to be submitted in three (3) copies (hard copy submittals) to the Area or Resident Engineer (as directed). All three (3) copies are to be submitted using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, are to be submitted to the Area or Resident Engineer (as directed) accompanied by three (3) copies of the transmittal form.

Except as noted below, data for all items listed as "FIO" Submittals in the various sections are to be submitted in three (3) copies (hard copy submittals). All three (3) copies are to be submitted to the Area or Resident Engineer (as directed) using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, are to be submitted to the Area or Resident Engineer (as directed) accompanied by three (3) copies of the transmittal form.

All hard copy submittals must be presented such that they fit into a standard size (letter) cabinet file drawer. Larger drawings must be folded to fit and not rolled. See paragraph: ELECTRONIC SUBMITTALS above for electronic submittals.

All submittals must be reviewed and approved by the Contractor's Quality Control Representative and Contractor's Designer prior to submittal to the Government. A completed Government conformance review is required on all Government Reviewed Construction submittals, prior to construction of the related items.

The Government has the option to review any For Information Only submittals.
1.10.3  Certificates of Compliance

Each certificate must be signed by an official authorized to certify in behalf of the manufacturing company and contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates must contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification is not to be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

1.10.4  Purchase Orders

Copies of purchase orders are to be furnished to the Contracting Officer when the Contractor requests assistance for expediting deliveries of equipment or materials, or when requested by the Contracting Officer for the purpose of quality assurance review. Each purchase order issued by the Contractor or his subcontractors for materials and equipment to be incorporated into the project are to (1) be clearly identified with the applicable DA contract number, (2) carry an identifying number, (3) be in sufficient detail to identify the material being purchased, (4) indicate a definite delivery date, and (5) display the DMS priority rating, if applicable.

1.10.5  Operation and Maintenance Data/Manuals

Where required by various technical sections, operations and maintenance data/manuals are to be provided by the Contractor in one (1) hard copy and three (3) separate electronic copies (three (3) CD-ROM copies), unless directed otherwise. Provide legible hard copies of the operations and maintenance data that are assembled in three-ring binders with index and tabbed section dividers and having a cover indicating the contents by equipment or system name and and include the project title and location. The legible electronic copies of the operation and maintenance data on the CD-ROMs are to be in a Adobe Acrobat .PDF format (Version 9.0) and be organized using bookmarks that define the contents by equipment or system name and includes Project Name and Location, unless directed otherwise by the Contracting Officer. Include the same information on the CD-ROM cover. Operation and maintenance data for mechanical and electrical systems are to be submitted for approval to the Contracting Officer 90 days prior to final tests of these systems, unless otherwise specified. Each operation and maintenance manual must contain a copy of all warranties and a list of local service representatives required by Section 01 78 36.00 24 WARRANTY OF CONSTRUCTION AND DESIGN. If field testing requires these copies to be revised, they are to be updated and resubmitted for approval within 10 calendar days after completion of tests. The Operations and Maintenance Data are to be shown as a separate activity on the Contractor prepared construction schedule bar chart or Network Analysis System (Project Schedule). In addition, all wiring and control diagrams and approved system layout drawings must be submitted and included with the O&M Data.
1.11 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Allow a minimum of 20 calendar days exclusive of mailing for any Government reviews and approvals, unless directed otherwise. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 20 calendar days will be allowed and shown on the register for review and approval of submittals for food service equipment and refrigeration and HVAC control systems.

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.11.1 Government Reviewed Design

The Government will review design submittals for conformance with the technical requirements of the solicitation. Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLE/PROCEDURES covers the design submittal and review process in detail. Government review is required for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. The Government may, but is not required, to review extensions of design such as structural steel or reinforcement shop drawings.

1.12 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

a. Note date on which submittal was received.

b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph entitled, "Review Notations," of this section and with markings appropriate for action indicated.
Upon completion of review of submittals requiring Government approval, stamp and date approved submittals. All copies of the approved submittal will be retained by the Contracting Officer, except for two (2) copies of the submittal will be returned to the Contractor for hard copy submittals. For electronic submittals, see paragraph: ELECTRONIC SUBMITTALS above. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

1.12.1 Review Notations

Contracting Officer review will be completed per paragraph SCHEDULING above. Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

b. Submittals marked "approved as noted" or "approved, except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.

c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.

d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.13 DISAPPROVED OR REJECTED SUBMITTALS

Contractor shall make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes," is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, the Contractor shall make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.14 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal.
Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.15 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

1.16 WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.17 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements is to be similar to the following:
For design-build construction, both the Contractor Quality Control System Manager and the Designer of Record are to stamp and sign to certify that the submittal meets contract requirements.

PART 2  PRODUCTS

Not Used

PART 3  EXECUTION

Not Used

-- End of Section --
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### Small Arms Range Complex - Buckley AFB, CO

#### SD-02 Shop Drawings
- **Explanation**: Equipment Room Drawings
- **Paragraph**: 1.24
- **Classification**: G RO

#### SD-05 Design Data
- **Explanation**: USACE BIM PROJECT EXECUTION PLAN (USACE PxP)
- **Paragraph**: 1.38
- **Classification**: G DO

#### SD-01 Preconstruction Submittals
- **Explanation**: Project Scheduler Qualifications
- **Paragraph**: 1.3
- **Classification**: G RO
- **Actions**: Action Code, Date of Action
- **Date Rcd From Contr**:
- **Date Rcd From Other Reviewer**:
- **Date Fwd To Contr**:
- **Date Fwd To Other Reviewer**:
- **Date Rcd To Appr Auth**:
- **Details**: Action Code, Date of Action

#### SD-07 Certificates
- **Explanation**: Third Party Certification (TPC)
- **Paragraph**: 1.4.4

#### SD-11 Closeout Submittals
- **Explanation**: Final Sustainability Notebook
- **Paragraph**: 1.5.2.1
- **Classification**: G DO
- **Actions**: Action Code, Date of Action
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- **Date Rcd To Other Reviewer**:
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- **Date Fwd To Other Reviewer**:
- **Date Rcd To Appr Auth**:
- **Details**: Action Code, Date of Action

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### Reminders
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- **Material Needed By**
- **Date Fwd To Appr Auth**
- **Mailed To Contr/Date Rcd Frm Appr Auth**
- **Remarks**
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**Title and Location:** Small Arms Range Complex - Buckley AFB, CO

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**Title and Location**: Small Arms Range Complex - Buckley AFB, CO

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TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE
For use of this form, see ER 415-1-10; the proponent agency is CECW-CE.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS
(This section will be initiated by the contractor)

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SPECIFICATION SEC. NO. (Cover only one section with each transmittal)

REMARKS
I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME OF CONTRACTOR

SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (List by item No.)

NAME AND TITLE OF APPROVING AUTHORITY

SIGNATURE OF APPROVING AUTHORITY

DATE
INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each Transmittal shall be numbered consecutively. The Transmittal Number typically includes two parts separated by a dash (-). The first part is the specification section number. The second part is a sequential number for the submittals under that spec section. If the Transmittal is a resubmittal, then add a decimal point to the end of the original Transmittal Number and begin numbering the resubmittal packages sequentially after the decimal.

3. The "Item No." for each entry on this form will be the same "Item No." as indicated on ENG FORM 4288-R.

4. Submittals requiring expeditious handling will be submitted on a separate ENG Form 4025-R.

5. Items transmitted on each transmittal form will be from the same specification section. Do not combine submittal information from different specification sections in a single transmittal.

6. If the data submitted are intentionally in variance with the contract requirements, indicate a variation in column h, and enter a statement in the Remarks block describing the detailed reason for the variation.

7. ENG Form 4025-R is self-transmitting - a letter of transmittal is not required.

8. When submittal items are transmitted, indicate the "Submittal Type" (SD-01 through SD-11) in column c of Section I.

   Submittal types are the following:
   SD-01 - Preconstruction  SD-02 - Shop Drawings  SD-03 - Product Data  SD-04 - Samples  SD-05 - Design Data  SD-06 - Test Reports
   SD-07 - Certificates  SD-08 - Manufacturer's Instructions  SD-09 - Manufacturer's Field Reports  SD-10 - O&M Data  SD-11 - Closeout

9. For each submittal item, the Contractor will assign Submittal Action Codes in column g of Section I. The U.S. Army Corps of Engineers approving authority will assign Submittal Action Codes in column i of Section I. The Submittal Action Codes are:

   A -- Approved as submitted.
   B -- Approved, except as noted on drawings. Resubmission not required.
   C -- Approved, except as noted on drawings. Refer to attached comments.
       Resubmission required.
   D -- Will be returned by separate correspondence.
   E -- Disapproved. Refer to attached comments.
   F -- Receipt acknowledged.
   X -- Receipt acknowledged, does not comply with contract requirements, as noted.
   G -- Other action required (Specify)
   K -- Government concurs with intermediate design. (For D-B contracts)
   R -- Design submittal is acceptable for release for construction. (For D-B contracts)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract.
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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 33 00.32

DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES

10/06; Rev 08/12

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Attachment C, Sample Submittal Paragraph
DD Form 1354 - Transfer and Acceptance of Military Real Property
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1.1 SUMMARY

a. Design

This section includes general requirements for developing and submitting a design including preparation of drawings, specifications, design analyses and other design deliverables conforming to the requirements contained in this section. Distribution requirements for design deliverables is also covered in this section. See Section 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS and Section 01 33 00.38 100 PERCENT DESIGN REQUIREMENTS for specific requirements.

b. Construction

This section includes distribution requirements for the construction set of design deliverables and distribution requirements for DD Form 1354 and as-built drawings. Included also are the construction submittal classifications for use in editing the technical guide specifications and instructions on revisions to accepted design during construction.

1.2 APPLICABLE REFERENCES

The references listed below form a part of this specification to the extent referenced.

1.2.1 THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI)

CSI Masterformat 2014     Master List of Section Titles and Numbers

1.2.2 NATIONAL CAD STANDARDS

(a) The National CAD Standards can be found at: https://www.nationalcadstandard.org/ncs6/. See Section 01 78 39.00 24 AS-BUILT DRAWINGS for a summary of CAD and general guidelines concerning file format and font requirements. The Contractor shall be responsible for furnishing the required CAD software.

1.2.3 WEB SITES

In addition to the web sites listed in this section, other RFP Sections may list web sites where design criteria references used in this solicitation
package may be found.

NOTE: FOR ITEMS (a), (b), AND (c) BELOW, REFERENCES TO RECEIVING APPROVAL FROM OTHER GOVERNMENT AGENCIES FOR ALTERNATIVE DESIGNS ARE NOT APPLICABLE TO THIS PROJECT. THE CONTRACTOR IS THE DESIGNER WHEN READING THESE DOCUMENTS.

ALL ITEMS LISTED BELOW ARE CONSIDERED TO BE A PART OF THE RFP SOLICITATION DOCUMENT (AS APPLICABLE) AND THE RESULTANT CONTRACT.

(a) UNIFIED FACILITIES CRITERIA (UFC), TECHNICAL MANUALS (TM), TECHNICAL INSTRUCTIONS (TI), AIR FORCE MANUALS (AFM), ENGINEERING TECHNICAL LETTERS (ETL), ARMY ARCHITECTURAL AND ENGINEERING DESIGN CRITERIA (AEI), SUSTAINABLE DESIGN DOCUMENTS, AND MILITARY HANDBOOKS (MIL HNDBK) can be obtained from the following internet addresses:


http://www.wbdg.org/

Additional web sites are as follows:

AIR FORCE DESIGN CRITERIA:

http://www.e-publishing.af.mil/

(3) UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS)

This includes UFGS sections referenced, but not provided in the solicitation and other UFGS sections required in developing the project specifications. Unless noted otherwise these Guide sections may be downloaded in Acrobat (Read Only).pdf file format or Specsintact SGML (zipped) file format at the following internet address:

http://www.wbdg.org/ccb/browse_org.php?o=70

Guide specification numbers and titles referenced in the solicitation may vary from the actual specification numbers and titles available at the website listed above.

Specsintact software is may be downloaded at the following internet address:

http://specsintact.ksc.nasa.gov/Software/software.shtml

SI Version 4.0 (Version SI4.5.1.951) or later shall be used. The new unified submittal format shall be selected for file format.

1.3 DEFINITIONS

1.3.1 Contractor

Firm or company to whom award was made to design and construct the Small Arms Range Complex, located at Buckley AFB, Colorado.
1.3.2 Design

Documents or deliverables, as defined in this section, prepared by or under the direct supervision of registered professional architects and engineers and proposed by the Contractor to meet the requirements of this solicitation.

1.3.3 Design Drawings

Documentation showing in graphic and quantitative form the extent, design, location, relationships, and dimensions of the construction to be provided by the Contractor. (Note: Shop Drawings, as defined in Section 01 33 00, "Submittals Procedures" are not to be provided until after design drawings are determined satisfactory for construction.)

1.3.4 Designer

Architects and Engineers (A-E) associated with the Contractor who are responsible for (1) preparing the design documents, (2) checking construction submittals, considered extensions of design (A-E), for compliance with the prepared Construction set design documents and (3) have the qualifications and experience specified herein.

1.3.5 Request for Proposal (RFP)

Documents furnished to prospective offerors containing proposal information and specifying criteria and project requirements for design and construction of a Small Arms Range Complex located at Buckley AFB, Colorado. The documents include this specification, attachments, and the RFP drawings.

1.4 QUALITY ASSURANCE

1.4.1 Construction Personnel Experience

The experience of the Construction Personnel assigned to work performed in connection with this solicitation shall be equal to or better than that indicated below. If, because of reasons beyond the control of the construction firm, the named individuals are not able to fulfill this obligation, replacement personnel with similar skills and experience shall be presented for acceptance by the Contracting Officer. Replacement individuals for this solicitation shall be required to have qualifications and experience meeting or exceeding those identified in the proposal. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated personnel.

a. Project Manager: The Construction Project Manager should possess a Bachelor's or Master's Degree in Architecture, Construction Management, or Engineering. The Construction Project Manager should have a minimum of five (5) years experience over the last ten (10) years performing as a construction project manager on construction projects with a construction dollar value greater than $500,000 and of a type similar to the work described in this solicitation. If the proposed Construction Project Manager has another Bachelor's or Master's Degree which is comparable to a Bachelor's or Master's Degree in Architecture, Construction Management, or Engineering, include a narrative describing how the degree is comparable. In lieu of a Bachelor's or Master's Degree, the proposed Construction Manager should have a minimum of
ten (10) years experience over the last 15 years performing as a construction project manager on construction projects with a construction dollar value greater than $500,000 and of a type similar to the work described in this solicitation.

b. Project Superintendent: The Project Superintendent shall have a minimum of five (5) years experience over the last ten (10) years performing as a project superintendent on construction projects with a construction dollar value greater than $500,000 and of a type similar to the work described in this solicitation.

c. Contractor Quality Control (CQC) System Manager: The proposed Contractor Quality Control (CQC) System Manager shall have a minimum of five (5) years experience over the last ten (10) years performing as a CQC System Manager on construction projects with a construction dollar value greater than $500,000 and of a type similar to the work described in this solicitation.

1.4.2 Designer Qualifications and Experience

The experience of the Design Personnel assigned to the work performed in connection with this solicitation shall be equal to or better than that indicated below. If, because of reasons beyond the control of the design team, the named individuals are not able to fulfill this obligation, replacement personnel with similar education and experience shall be presented for acceptance by the Contracting Officer. Replacement individuals for this solicitation shall be required to have qualifications and experience meeting or exceeding those identified in the proposal. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated personnel.

Project Managers and Lead Designers should be registered professional architects or engineers with at least five (5) years experience as a registered professional in the proposed position/role in the design of similar projects. Projects should be at least $500,000 in construction cost, of a type similar to the work described in this solicitation, and completed within the past five (5) years of the date that proposals are due. Required Design personnel are listed below. Designers shall be immediately available for design services at the time of Notice to Proceed:

- Project Manager (Registered Architect or Engineer)
- Registered Architect
- Registered Structural Engineer
- Registered Mechanical Engineer
- Registered Electrical Engineer
- Registered Civil Engineer

1.5 SUBMISSION OF DESIGN DRAWINGS, SPECIFICATIONS AND DESIGN ANALYSES

1.5.1 Design Certification

Within each design submittal, the Contractor shall certify that all items submitted in the design documents (after construction award) comply with this RFP, the Division 1 specifications, and mandatory requirements of the UFGS. The criteria specified in this RFP are binding contract criteria and in case of any conflict, after award, between the RFP criteria and Contractor's submittals, the RFP criteria will govern unless there is a written and signed agreement between the Contracting Officer and the Contractor waiving a specific requirement. The Contractor shall present
with the letter of transmittal for each design submittal (including the 100% corrected design (backcheck) submittal) a certification that the submittal (plans, specifications, design analysis, etc.) complies with the requirements stated above, similar to that shown at Attachment A of this section.

1.5.2 Deviations

Deviations from the RFP technical requirements shall be identified in the letter of transmittal and design certification letter. Deviations from the RFP technical requirements will be considered and accepted by the Contracting Officer, if the changes result in a significant improvement to the project or it exceeds the minimum RFP technical requirements.

1.5.3 Field Inspection

The Contractor shall verify field conditions which are significant to design, by field inspection, researching and obtaining all necessary existing facility as-built drawings and reproducing them for his own use as necessary, and discussing status with knowledgeable personnel. The information shall be reflected in the design documents.

1.5.4 Drawings

1.5.4.1 Software Requirements

All design drawings shall be done by the Contractor using Autodesk Revit (.rvt) 2016 file format and ESRI 10.1 for GeodataBase Files. Format shall conform to the National CAD Standards and the Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata.

1.5.4.2 RFP Drawings

The drawings furnished with this solicitation will be furnished to the Contractor in Autodesk Revit 2015 .rvt file format. See Section 01 30 00.00 24 OTHER ADMINISTRATIVE AND SPECIAL REQUIREMENTS for when the RFP Drawings will be made available.

1.5.5 Design Documents

Design documents, as required by the 60 percent and 100 percent design submittals stated hereafter, shall include construction drawings, specifications, design analysis, and other design deliverables for categories such as, but not limited to, architectural, interior design, structural, mechanical, electrical, communications, fire protection, grading, drainage, paving, and outside utility services. Specifications shall be in sufficient detail to fully describe and demonstrate the quality of materials, the installation and performance of equipment, and the quality of workmanship. Detailing and installation of all equipment and materials shall comply with the manufacturer's recommendations. The design analysis shall be for each discipline of work and shall include all features with the necessary calculations, tables, methods and sources used in determining equipment and material sizes and capacities, and shall provide sufficient information to support the design.

1.5.6 Design Reviews

A minimum of two design reviews during design will be held at Buckley AFB,
Colorado at the 60 percent and the 100 percent completion stages of the final design. A backcheck review will be made on the Corrected 100 percent design. Once the Corrected 100 percent design is reviewed and determined to be satisfactory for the purpose of beginning construction, the Contractor shall prepare and distribute sets of documents for construction. The Contractor shall attend the design reviews, visit the site and make other trips as necessary during the design to accomplish the work.

1.5.7 Document Packaging

The 60 percent design submittal includes the 60 percent complete site and utility design and building design (See 01 30 00.24 OTHER ADMINISTRATIVE AND SPECIAL REQUIREMENTS, paragraph: Sequence of Design-Construction for optional packaging and submission of design documents). These documents shall be packaged and stamped "For Review Only - 60% Design"; and each sheet of the drawings shall also be stamped. The 100 percent design submittal includes 100 percent complete site and utility design and building design and shall be stamped "For Review Only -100% Design", and each sheet of the drawings shall also be stamped. The backcheck design submittal(s) after the Government review of the 100 percent complete site and utility design and building design shall be stamped "100% Corrected Design"; and each sheet of the drawings shall also be stamped. The 100% Corrected Design submittal is for making corrections resulting from review comments and for preparing the final project documents. No additional time for completion of the contract will be granted to the Contractor due to insufficient design submittals. See paragraph 3.7.6 "Government Design Review and Acceptance" for additional requirements.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 DRAWINGS

Prepare, organize, and present drawings in the format specified herein. Provide drawings complete, accurate and explicit enough to show compliance with the RFP requirements and to permit construction. Drawings illustrating systems proposed to meet the requirements of the RFP performance specifications shall reflect proper detailing for each such system to assure appropriate use, proper fit, compatibility of components and coordination with the design analysis and specifications required by this section. Coordinate drawings to ensure there are no conflicts between design disciplines and between drawings and specifications. For specific drawing requirements, see Sections 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS and 01 33 00.38 100 PERCENT DESIGN REQUIREMENTS. The following subparagraphs cover general drawing requirements.

3.1.1 Drawings Format

Full size drawings are considered 22 inches x 34 inches. Half-size drawings are considered 11 inches x 17 inches. Title block shall be as indicated in the National CAD Standards website. Recommended drawing scales are specified in Sections 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS and 01 33 00.38 100 PERCENT DESIGN REQUIREMENTS. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. Drawing project code numbers on
all border sheets for the design and construction drawings shall be as follows: BU77. FILE NUMBER on all border sheets for the design and construction drawings shall be as follows:

AF178-04-01

See attached Example Drawing Title Block Information Key.

3.1.2 Drawings Sequence

Arrange drawings by design discipline in accordance with National CAD Standards.

3.1.3 Drawings Required

As a minimum, the Contractor shall prepare and submit the following design drawings:

a. Title Sheet, Index of Drawings, Legend and Abbreviations and Soil Borings.

b. Civil Drawings

c. Utility Drawings (Water Supply, Wastewater, Gas, and Electrical)

d. Architectural Drawings

e. Interior Design Drawings

f. Structural Drawings

g. Mechanical Drawings

h. Plumbing drawings

i. Electrical Drawings

j. Communications Drawings

k. Fire Protection Drawings

3.2 SPECIFICATIONS

3.2.1 Project Specifications

3.2.1.1 General Requirements

The Contractor shall develop project specifications utilizing the Division 1 Specifications furnished with this RFP; unedited Unified Facilities Guide Specifications (UFGS); designated specification sections furnished with this RFP; and the development of additional project specifications not covered by UFGS. Guide specifications may be downloaded in Acrobat (Read Only).pdf file format or Specs Intact SGML (zipped) file format at the internet address listed above. A copy of the UFGS sections and RFP sections that were available at the time this solicitation was issued will be furnished to the successful offeror on CD-ROM. Specifications will be edited utilizing the Master Format 2014 numbering system.
The Contractor shall utilize SpecsIntact software.

Minimum hardware requirements are as follows:

Windows® Operating System: Windows Vista, 7, 8 or 10

CPU: Pentium processor or better

Hard Disk Space: 100 MB

RAM: 256MB or greater

Display: SVGA or better

Drives: CD-ROM/DVD

Printer: LaserJet/InkJet/OfficeJet/BubbleJet/Multifunction Device

After installation, SpecsIntact only requires 30MB disk space for a Local installation and 56MB for a Network installation. Additional space is required for new projects as well as Masters, which are downloaded separately.

3.2.1.2 Technical Specifications

The Contractor shall be required to use unedited UFGS sections for developing project specifications. Specification paragraphs and subparagraphs shall not be rewritten to lessen the quality of the original technical specification sections, unless directed otherwise. The technical guide specifications describe the type and quality of material and installation normally acceptable for Corps of Engineers Construction, and often represent specific agreement between the Government and the applicable industry. The provision of the technical guide specification should not be changed without justification. Justifications and identification for additional materials shall be identified in the design analysis under the appropriate design discipline. Designer notes shall not appear in any design submittals. Only bracketed choices and inapplicable items shall be marked for deletion. These items shall be removed in corrected 100 percent specifications submittal. The Contractor shall complete the editing of all options in these specifications. Where designer notes are provided, the Contractor shall edit the choice in accordance with the recommendations and guidance of the Notes, except where specific guidance has been provided with this RFP (i.e. submittal paragraph). See additional requirements in Sections 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS and 01 33 00.38 100 PERCENT DESIGN REQUIREMENTS.

3.2.1.3 Editing Technical Specifications (UFGS)

(1) Incorporating Established RFP Requirements into Guide Specifications

Where specific requirements in regards to materials, methods and end function requirements are provided in the edited RFP Division 1 provided in this RFP, the unedited Unified Facilities Guide Specifications (UFGS) shall be edited to reflect these requirements. Variations to these requirements will not be permitted, unless authorized as a design deviation by the Contracting Officer.
(2) Requirements of Guide Specifications Not Established By RFP

Requirements

Where specific direction has not been provided in regards to materials, methods and end function requirements, the final requirements will be a result of the completed design by the Contractor.

The applicable unedited UFGS Sections, Divisions 2 through 49, provide requirements for a variety of materials and systems. Deleting applicable requirements from these specifications will not be permitted, unless accepted as a design deviation by the Contracting Officer.

(3) ADDITIONS: If the specifications of the UFGS does not cover a feature that is in the project, new sentences and/or paragraphs shall be inserted in the proper locations to adequately cover the feature of work. Additions shall not lesson the quality of materials indicated by the specifications. If a new material is added, it shall be properly referenced in "Applicable Publications," "MATERIALS," "SUBMITTAL," "TESTS," and "INSTALLATION" paragraphs, as applicable.

(4) DELETION OF INAPPLICABLE TEXT MATERIAL, AS NECESSARY, TO TAILOR THE SPECIFICATIONS TO FIT THE PROJECT: After deletion has been made to all inapplicable paragraphs, subparagraphs, choices, and schedules from the body of the specifications (including but not limited to the correction of lists in "Submittals," "Tests," and "Installation" paragraphs), delete all non-applicable references listed in the preceding "APPLICABLE PUBLICATIONS" and "MATERIALS" paragraphs. Deletions shall not lesson the quality of materials indicated by the specifications.

(5) Do not remove any special code markings for submittals, references, tests or section references, unless the text is not required.

(6) REFERENCES TO SPECIFICATION SECTIONS. The Contractor shall be responsible for coordinating section references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

(7) REFERENCES. The Contractor shall be responsible for coordinating references or publications referenced in the text of each specifications with those references listed at the beginning of each section. See paragraph: Reports below. The Specsintact Software removes references or publications not referenced in the text from the Reference Article, when printing from the Jobs menu.

(8) SUBMITTALS. Each section of the specifications includes a submittal paragraph which lists all applicable Contractor submittals. Submittals shall be properly marked as outlined in the SpecsIntact documentation and in this section. These codings are used for automatic generation of the Submittal Register in the SpecsIntact Software. These codings must NOT be deleted from the text, unless the submittal is not required. The Submittal Item text between the coding shall be identical (word for word, including punctuation and spacing) to the paragraph text in the reference paragraph(s). Text may be either upper or lower case letters. An example of a submittal
paragraph is provided in Attachment C, "Sample Submittal Paragraph".

During this design phase, the Contractor's Designer(s) shall develop a complete list of required construction submittals in each technical specification. The list is to be used in preparing the Submittal Register for approval by the Contracting Officer Representative (COR). The example Submittal Register furnished with this Solicitation was created using SpecsIntact Software. The Contractor shall replace this example Submittal Register with the actual submittal register developed from the completed design specifications. This list is not all inclusive and additional submittals may be required as directed by the COR. Both the attached sample and the Contractor-generated submittal registers identify only the submittal section, type of submittal, description of item submitted, paragraph number related to submittal item (section submittal paragraph if none listed), submittal classification (G or FIO), and submittal reviewer identifier (DO or AO). See the below discussion on submittal classifications for additional information.

See Section 01 33 00 SUBMITTAL PROCEDURES, for complete instructions related to submittal descriptions, classifications, numbers, and submittal process. Unless directed otherwise by the Contracting Officer, the words "Government Approval" associated with "G" designated submittals shall be interpreted as defined herein and in section 01 33 00 SUBMITTAL PROCEDURES.

Submittal Classifications defined in Section 01 33 00 are G-DO, G-AO, and FIO. One of these designations shall be used for all submittal requirements. For each submittal requirement in the Guide specification, designers shall indicate a submittal type (G-DO, G-RO, or FIO) or shall delete the requirement for the submittal if it is not required. The references to "G-AE" and "G-PO" submittal types in the designer notes of the technical guide specifications shall be disregarded and submittals shall be designated G-DO, G-RO, or FIO as determined by the Designer in accordance with the instructions in this section and Section 01 33 00 SUBMITTAL PROCEDURES, unless directed otherwise. There shall be no "G-AE" or "G-PO" submittals in the submittal register.

To designate a submittal item as FIO, mark the semi-colon following the submittal item and also the submittal tags up to the Item tag for deletion (i.e. "; [ ], [ ]"). Designers shall identify submittal classifications for all required submittals.

(9) USE OF UFGS SECTIONS

Unless directed otherwise, use UFGS sections. UFGS sections are joint effort of the U.S. Army Corps of Engineers (USACE), the Naval Facilities Engineering Command (NAVFAC), National Aeronautics and Space Administration (NASA) and the Air Force Civil Engineer Support Agency (AFCESA). In instances where more than one UFGS section addresses the same material or system requirement, as a general rule, use the Section developed by the USACE specification proponent. Available UFGS sections with the numbers ending ".00 10", ".00 20" or ".00 40" following the section number are sections that have not yet been unified by the different Government design agencies. The ending numbers designate the specification proponent (".00 10" is for USACE, ".00 40" for NASA and ".00 20" is for NAVFAC). Where UFGS sections include tailoring options for both the various proponents (Army, NASA
and Navy), use the Army tailoring option. Where conflicts exist that cannot be resolved, the Contracting Officer shall be contacted to resolve the issue.

### 3.2.1.4 Developing Additional Project Specifications

If the need should arise for developing project specifications on materials/items not covered by the UFGS, the Contractor shall develop specifications utilizing commercial Construction Specifications Institute (CSI), 49 Division, 3 Part Section Format. These specifications shall conform to the applicable criteria requirements indicated in the task order or solicitation. For these specification sections, write at the Mediumscope level of detail as described in CSI Masterformat. Use Mediumscope level section numbers and titles as identified in CSI Masterformat. Adjust section numbers which conflict with the specifications used in the Project Specifications. Each of these developed specification sections shall be in the same format as the CSI format specifications included in the UFGS (including the submittal paragraph). Commercially available guide specifications such as "SpecText" published by The Construction Specifications Institute and "MasterSpec" published by The American Institute of Architects or Unified Facilities Guide Specifications (UFGS) may be used, subject to the format, coding and submittal paragraph requirements. References to the "Architect/Engineer" and the "Owner" shall be changed to refer to the "Government" or "Contracting Officer," as appropriate. The specifications shall clearly identify, where appropriate, the specific products chosen to meet the requirements of the specifications (manufacturers' brand names and model numbers or similar product information). The Contractor shall be responsible for coordinating references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

### 3.2.1.5 Division 0 and 1 Sections

Include Division 0 and 1 specifications sections contained in the RFP as part of the project specifications without change, unless directed otherwise:

- 00 73 00 SPECIAL CONTRACT REQUIREMENTS,
- 01 30 00.24 OTHER ADMINISTRATIVE AND SPECIAL REQUIREMENTS,
- 01 32 01.00 10 PROJECT SCHEDULE,
- 01 33 00 SUBMITTAL PROCEDURES,
- 01 35 26 GOVERNMENTAL SAFETY STANDARDS,
- 01 41 26.05 24 (FEDERAL FACILITIES COLORADO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES
- 01 45 00.00 10 QUALITY CONTROL,
- 01 45 00.10 10 QUALITY CONTROL SYSTEM (QCS)
- 01 57 20.00 10 ENVIRONMENTAL PROTECTION,
- 01 62 35 RECYCLED / RECOVERED MATERIALS,
- 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT,
- 01 78 23 OPERATION AND MAINTENANCE DATA,
- 01 78 36.00 24 WARRANTY OF CONSTRUCTION AND DESIGN,
- 01 78 39.00 24 AS-BUILT DRAWINGS

Copies of these sections and other Division 1 specifications included with the RFP will be furnished upon request to the successful offeror in specsintact. The Contractor shall be responsible for including any amendment revisions issued into these sections. Any other Division 1
Specifications required by the Contract shall be the responsibility of the Contractor, including 01 42 00 SOURCES FOR REFERENCE PUBLICATIONS. Additional specifications indicated elsewhere in the solicitation or required by the Contractor should be included.

3.2.2 Format for Project Specifications

Submit the project specification, including a Cover page and Table of Contents, printed with a word processor (Using SpecsIntact software) using good quality white paper. For the 60 percent and 100 percent design submittals, editing of the UFGS shall be shown as indicated in the SpecsIntact documentation for text deletions and for text insertions (i.e., 60% and 100% review specifications shall be printed to show all insertions and deletions). The corrected 100 percent specifications with review comments incorporated shall be cleaned up (markings for insertion and deletion removed) and submitted in both hard copy and on CD-ROM (compatible with Microsoft Windows and the "SpecsIntact" micro computer software package). The Cover page and attachments to specification sections shall be prepared in a Microsoft Word (compatible with Microsoft Word 2013) format.

Format shall be as outlined in the SpecsIntact documentation.

Each specification section shall include a Section Table of Contents which is combined with the page numbering of the specification section.

The Cover page shall be similar to the RFP Cover page and shall include:

a. Project title, Project Number, activity and location

b. Construction contract number

c. Construction Contractor's name and address

d. Design firm's name and address

e. Names of design team members (Designers of record) responsible for each Contractor prepared technical discipline of the project specification

f. Name and signature of a Principal of the design firm

The Table of Contents shall list the 49 Divisions contained in CSI format and the specification section numbers and titles contained in the project specification.

3.2.3 Reports

The Contractor shall submit the following Specsintact reports with the 100 percent and Corrected 100 percent design submittals: Address Verification, Reference Verification, Section Verification, Bracket Verification, Submittal Verification, Submittal Register and any other reports requested by the Contracting Officer. References shall be reconciled when printing reports. The reports to be submitted for review shall be after the Contractor has corrected the errors generated by these reports. From the errors generated by the reference verification reports, fix only those errors where there is a discrepancy with the issue date of a publication (i.e., NFPA 70, revise to the latest code requirement). Address, Reference...
and Submittal Reconciliation shall be completed prior to submittal of the 100 percent design.

3.2.4 Construction Submittals

All construction submittals shall be in accordance with Section 01 33 00, SUBMITTAL PROCEDURES.

Construction submittal types and products, including the submittal description numbers and data package numbers, shall be included in the specification sections, where required. When appropriate, use specific product terms instead of the generic product terms contained in the specifications sections.

3.2.4.1 Submittals Register (Form)

Prepare and maintain a Submittals Register. The Submittal Register (ENG Form 4288) shall be prepared using SpecsIntact Software. Additional instructions for completing the form are contained in Section 01 33 00 SUBMITTAL PROCEDURES.

Fill in columns "c" through "f" and submit with the 100 percent design submittal. The Submittal Register will be returned to the Contractor along with the reviewed and accepted design.

Resubmit the Submittal Register as a construction submittal as required in Section 01 33 00 SUBMITTAL PROCEDURES. The Contractor shall provide an electronic copy of the accepted submittal register (NAVY4288.txt file), generated by the SpecsIntact software, three (3) working days prior to the pre-construction conference. Remaining columns will be filled in at the appropriate time and by the appropriate authorities during construction.

3.3 DESIGN ANALYSES

Prepare design analyses (basis of design and calculations) for each design discipline. Specific requirements relative to the technical content to be provided are specified herein and in Section 01 33 00.36 60 PERCENT DESIGN SUBMITTALS and Section 01 33 00.38 100 PERCENT DESIGN SUBMITTALS. The design analyses shall include a basis of design and calculations for each discipline. The design analyses shall be a presentation of facts to demonstrate that the concept of the project is fully understood and that the design is based on sound engineering. The design analysis for each discipline shall include:

a. A basis of design consisting of:

   (1) An introductory description of the project concept which addresses the salient points of the design;

   (2) An orderly and comprehensive documentation of criteria, rationale, assumptions and reasoning for system selection.

b. Calculations required to support the design.

c. Project Engineering Considerations and Instructions (ECI) for Final Design Analysis.

The Contractor shall not make reference to the RFP solicitation to avoid
stating the requirements for the basis for design.

3.3.1 Format

The design analysis shall include: a cover page indicating the stage of design "PRELIMINARY DESIGN ANALYSIS" for 60 percent design submittal and "FINAL DESIGN ANALYSIS" for 100 percent design submittal, the project title "SMALL ARMS RANGE COMPLEX AF178-04-01", fiscal year and program funding "FY 17 MCAF", location "BUCKLEY AFB, COLORADO", who prepared the design analysis "Prepared By:" followed by Name of AE and Construction Contractor, location of AE and Construction Contractor Office involved with the design, and construction contract number; table of contents; and tabbed separations for each part of design analysis for quick reference. The cover sheet shall indicate the volume number and total number of volumes for the project. Provide a cover sheet for each volume. Submit design analyses prepared on 8 1/2 by 11-inch white paper. The design analysis for all disciplines shall be bound in one volume, excluding calculations. Multiple volumes for individual disciplines, appropriately numbered, may be provided, when required. For Electronic media requirements, see the NOTES for the Construction Set Distribution (paragraph 3.7.1.6). Narratives shall use a decimal paragraph numbering system (i.e. 1, 1.1, 1.1.1, 1.1.1.1, etc.). Narratives shall be an original document that does not copy the text from the RFP document sections, unless directed otherwise, and shall be written in the same tense (Past or Present) for the entire design analysis. Each part of the design analysis shall include part number and page numbering (consecutive page numbering for each part). Organize design analysis narrative into the following parts, as follows:

3.3.1.1 Part 1 - General Description.

This part will provide statements of purpose, authority and applicable criteria. A description of the project and a summary of the economic factors influencing the choice of the civil, architectural, structural, mechanical, electrical, communications, fire safety, water supply, and wastewater disposal systems used in the project shall be provided along with an indication of how initial and life costs were considered.

a. Purpose. Include a statement under the heading of "PURPOSE" that applies to the project and is similar to the statement below:

"Sample Statement: The purpose of this project is to provide a facility which allows for adequate comprehensive programs for both military personnel and their dependents. The anticipated average daily attendant for this facility will be 450 persons. The facility provides for adequate support for athletics, aerobic activities, auxiliary administrative support, parking and support area."

b. Authority. Provide the following authorization statement under the heading "AUTHORITY" for the project:

"The preparation of design documents was authorized by Design Directive dated 15 July 2016."

c. Applicable Criteria. Provide a list of the general criteria that pertains to all disciplines used in the design. Specific criteria used in a particular engineering/architectural discipline shall be listed in the text of the appropriate discipline in Part 2 of the design analysis. Such criteria shall be referenced accordingly.
d. Project Description. Provide a description of the project and summary of economic factors influencing the choice of materials and systems used in the project.

3.3.1.2 Part 2 - Design Requirements and Provisions.

This part of the design analysis shall provide statements of factors considered and provided in the design along with supporting justification of design decisions and design calculations. Include narratives for each of the following areas or disciplines. See Sections 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS and 01 33 00.38 100 PERCENT DESIGN REQUIREMENTS for specific requirements.

a. Civil
b. Water Supply and Wastewater
c. Architectural
d. Interior Design
e. Structural
f. Mechanical
g. Electrical
h. Communications
i. Fire Protection
j. Environmental Protection, Compliance and Permits
k. Health and Safety
l. Sustainable Design

3.3.2 Calculations

All calculations shall be placed in separate appendix volume(s). Calculations shall include a cover page similar to the design analysis narrative cover page, a table of contents, index page and a summary of criteria for each appendix on the first pages and the project title, and location identified on every page of the calculations. All calculation pages shall be clearly legible and photo-ready. Each discipline which requires calculations shall be consecutively numbered (Example: A-1, A-2, A-3 etc. for Water Supply and Wastewater Calculations and B-1, B-2, B-3, etc. for Structural Calculations) and the date. Cite criteria from which the calculations, rationale, and formulae are extracted by publication number, title, edition and page number. The cover page and each page of calculations shall also include the names of the persons originating and checking the calculations. The person checking the calculations shall be a registered professional engineer other than the originator. In addition, the signature and seal of the appropriate registered professional engineer responsible for the work shall appear on the cover page of the calculations for each discipline. Each appendix index page shall list subtopics (e.g. for Structural - Loads, Materials, References, Wind Analysis, Footing Design, Wall Design, Column Design, etc.) with pages numbers where each of these subtopics can be found in the calculations.
Computer printouts shall be consecutively page numbered and identified similar to the calculations. Identify the computer program name, source, and version. All schematic models used for computer input shall be provided.

3.3.3 Engineering Considerations and Instructions (ECI) for Field Personnel

3.3.3.1 Separate Appendix

Under a separate appendix in the Final Design Analysis, the Design-Build Contractor shall include the following items:

a. Features critical to the quality of the final construction product requiring special attention.

b. Submittals requiring special attention during construction.

c. Special user requirements or instructions.

d. Assumed field conditions, pertinent significant aspects, or critical phases of the project used as a basis of project design.

3.3.3.2 Format

Format for ECI's shall include the following information:

"ENGINEERING CONSIDERATIONS AND INSTRUCTIONS

Project Name:_______________________________________________

Location: _______________________________________________________

Designer Name:______________________ Phone:______________________

Discipline:________________________________

Design-Build designers have prepared the following engineering considerations and instructions (ECI). These ECI's should be followed during the construction of the above project. If you have any questions, contact the appropriate Design-Build designer."

3.3.3.3 Distribution of ECI's

In addition to including ECI's in a separate appendix of the final design analysis and after acceptance of the 100 percent corrected design and prior to the start of construction, the design-build Contractor shall e-mail a copy of the ECI's to the appropriate U.S. Army Corps of Engineer's Field representative for his consideration with a copy also sent to the appropriate individual in following office(s): CENWO-CD-S-TS and CENWO-PM-M. The Government will provide the names and e-mail addresses to the design-build Contractor at either the pre-design or pre-construction conference.

3.3.4 Requests for Information, Meeting Minutes and Comments

Copies of Requests for Information (RFI) made by the Contractor to the Government shall be included as an appendix to the design analysis. An index of each RFI, which documents the RFI number, the date RFI given to
Government, the date the RFI is answered and the Action Response provided by the Government.

A copy of all meeting minutes and design review comments (if any) with action responses shall be included as an appendix to the design analysis.

Appendices for RFI's and Meeting Minutes and design review comments shall have page numbering that follows the same format as for Calculations listed above.

3.4 Presentation Rendering

The contractor shall provide a presentational rendering of the exterior of the Small Arms Range Complex. The rendering shall be created in traditional art media, as opposed to being created digitally. The final image shall be matted and framed to be approximately 24 inches by 36 inches. The frame shall be black anodized aluminum. Provide the image with a metal identifying plaque. The completed image shall be ready for hanging. The rendering shall show the architectural character of the the facility and be realistically colored, as well as show the context of the facility, such as showing specific base facilities in the background to help site the facility for viewers. The contractor shall also provide a digital copy of the original traditional media rendering.

The media artist shall provide a concept sketch of the rendering at the 60 Percent Review Conference for feedback from Buckley AFB. The media artist shall coordinate with Buckley AFB through the COR for additional drawing requirements and aesthetic direction.

3.5 DESIGN CERTIFICATION

The Contractor shall provide certification signed by an officer of the Contractor's company attesting that the drawings, specifications and design analyses prepared for the construction of the facility meet the requirements of the RFP. The certification shall accompany the submission of the design documents along with names and disciplines for the designers of record. This design certification shall include a list of deviations (variations) from the solicitation or accepted final design. Prepare the design certification and transmittal letter in the format shown on Attachment A or Attachment B included at the end of this section.

3.6 60 PERCENT DESIGN SUBMITTALS

See Section 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS.

3.7 100 PERCENT DESIGN SUBMITTALS

See Section 01 33 00.38 100 PERCENT DESIGN REQUIREMENTS.

3.8 REVIEW BY GOVERNMENT AGENCIES

3.8.1 Distribution of Design Documents for Conformance Review

(a) Government agencies shall receive review documents thirty (30) days prior to review conferences. The documents will be in their then-present "on-board" design status (except for the 100% design submittal). Agencies reviewing documents, and in the quantities indicated, are listed below. All documents must contain an index of contents. Work shall continue during the review period between the 60% design submission and the 60% design review
conference. Work shall be 100% complete when the 100% design is submitted. Design work shall not continue during the review period between the 100% design submission and the 100% design review conference. All submittals shall be transmitted by express mail. Originals of transmittal letters should be sent to the Omaha District and copies should accompany each mail package. Transmittal letters shall indicate distribution by use of the "ATTN" code shown in the address. Design document set shall include the items listed below. Some of the Construction submittals are also listed. Design submittals shall be submitted as a complete package (i.e. drawings, specifications, DA, etc). The distribution listed below also applies to all design reviews and design package accepted for construction.

(b) For the 60% and 100% review submittals, if the Government requires more time than the thirty (30) days given, prior to either of the review conferences, the Contractor will be granted an extension of time equal to the number of calendar days of delay.

(c) The Government requires fourteen (14) days to review 100 Percent Corrected Design submittals after receipt of these documents. If the Government requires more than the days given, the Contractor will be granted an extension of time equal to the number of calendar days of delay.

3.8.1.1 Design Submittal Items

The design-build Contractor shall submit electronic copies of the following items as applicable for each design submittal: design analysis, design analysis calculations and appendices, specifications, specification error reports, submittal register, color boards, DD Form 1354, environmental protection plan, backcheck review comments, LEED report, design certification letter with deviations, drawings, and engineering considerations and instructions (ECI) on CD or DVD in an Adobe Acrobat 9.0 (.pdf format in the quantity indicated by the 'EMedia' designation and one (1) hard copy of each document contained on the electronic media per office per submittal listed below unless indicated otherwise. Each of these electronic documents shall utilize bookmarks with titles, which ease the review of the design. Each design submittal item and submittal item components shall be made easy to find (i.e. each specification section, chapters and appendices of design analysis, and each submittal item). Electronic format documents shall be legible and permit ease of design review. Poor quality scans of as-built drawings or other materials are unacceptable. Failure to meet this requirement on one design submittal may result in requiring all future submittals and resubmittals to be hard copy, at no additional cost to the Government. Note that in addition to electronic color boards, actual colorboards are also required; see requirements in the following DESIGN DISTRIBUTION paragraphs.

The submittal items listed below are intended to identify the different design submittals required throughout the design process and select submittals required during and at the completion of Construction. Each submittal item has an Abbreviation, which will be used in conjunction with the number of required copies. See paragraphs 3.7.1.3 through 3.7.1.7 for required copies for distribution.

SUBMITTAL ITEM - ABBREVIATION

Drawings (1/2 size) - Dwg-1/2
Electronic Media Drawings - EMedia
3.8.1.2 Activity Distribution Addresses

Engineering Division
Attn: CENWO-PM-M (Jeff Tessin)
U.S Army Engineer District, Omaha
1616 Capitol Avenue
Omaha, NE  68102-4901

Denver Area Office
Attn: CENWO-CD-V (Jesse Dalby)
U.S. Army Corps of Engineers
98 Inverness Dr. East, Ste. 370
Englewood, CO  80012

Buckley Resident Office
Attn: CENWO-CD-RM-D (Neal Parker)
U.S. Army Corps of Engineers
660 South Aspen Street, Bldg. 1005, Room 254
Buckley AFB, Aurora, CO  80011

Omaha District Office
Attn: CENWO-CD-S-TS (Russell Matthews)
U.S. Army Corps of Engineers
1616 Capitol Avenue
Omaha, NE  68102-4901

3.8.1.3 60 Percent Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>CENWO-PM-M</th>
<th>CENWO-CD-V</th>
<th>CENWO-CD-RM-D</th>
<th>CENWO-CD-S-TS</th>
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<tbody>
<tr>
<td>Dwg-1/2-</td>
<td>9</td>
<td>2</td>
<td>3</td>
<td>1</td>
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<tr>
<td>EMedia</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Color-Board</td>
<td>?</td>
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60 PERCENT SUBMITTAL NOTES:

* - Reviewers not requiring a hard copy of the items included on the electronic media.

(1) Copy shall show deletions and insertions (Revisions On) for all UFGS specifications submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents); Under "Options" Section Dates shown, Units of Measure as English, Tags are Hidden, Notes are hidden, Revisions are shown, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and
jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).

(2) Electronic Media Drawings:
Drawings shall be submitted in AutoCAD (.dwg) and Adobe (.pdf) on CD-ROM as well as on paper.
Provide the following drawings on the 'EMedia' CD or DVD:

- Drawings as listed in specification 01 33 00.36 60% Design Requirements

(3) Electronic color boards shall be included in each submittal and shall show colors of all proposed exterior and interior finishes. Actual color boards shall also be included in this submittal and are indicated by a quantity number in the submittal distribution; these color boards shall show actual color samples of all proposed exterior and interior finishes.

3.8.1.4 100 Percent Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>CENWO-PM-M</th>
<th>CENWO-CD-V</th>
<th>CENWO-CD-RM-D</th>
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<tr>
<td>Submittal Item</td>
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Dwg-1/2-  9  2  3  1
EMedia    9  1  2  1
FF&E ?  ?  ?  ?
Color- ?  ?  ?  ?
Board (3)

100 PERCENT SUBMITTAL NOTES:

* - Reviewers not requiring a hard copy of the items included on the electronic media.

Specific Submittal requirements are addressed in Section 01 33 00.32 and 01 33 00.38.

(1) Copy shall show deletions and insertions (Revisions On) for all UFGS specifications submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Reconcile References, Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents), and Reference Verification, Submittal Verification, Reference Verification, Submittal Verification, Bracket Verification, Section Verification and Submittal Register boxes are checked; Under "Options" Section Dates shown, Units of Measure as English, Tags are Hidden, Notes are hidden, Revisions are shown, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the RFP).

(2) Electronic Media Drawings:
Drawings shall be submitted in AutoCAD 2014 and Adobe (.pdf) on CD-ROM as well as on paper.
Provide the following drawings on the 'EMedia' CD or DVD:

- Drawings as listed in specification 01 33 00 38 100% Design Requirements

(3) Electronic and an actual color boards are not required if there are no changes from the previous design submittal. If only minor changes are required, resubmit the electronic color boards and color legend in addition to submitting applicable coded samples (with tape ready for application) and corrected color legend for the actual color board. If major changes to the color board are required, resubmit the electronic and actual color boards with color samples of all proposed exterior and interior finishes and revised corrected color legend. As required, note that electronic color boards shall be included in each submittal and the requirement for the actual color boards are indicated by a quantity number in the submittal distribution.

3.8.1.5 100 Percent Corrected Design Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

<table>
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<tr>
<th>Activity</th>
<th>CENWO-PM-M</th>
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<td>Color-Board (3)</td>
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100 PERCENT CORRECTED SUBMITTAL NOTES:

* - Reviewers not requiring a hard copy of the items included on the electronic media.

Specific Submittal requirements are addressed in Section 01 33 00.32 and 01 33 00.38.

(1) Copy shall show revisions executed (deletions removed and insertions markings removed) for all specification sections submitted. Process and Print Options for each section furnished shall include the following minimum requirements: Under "Sections" Reconcile References and Addresses, Print/Process Sections and Renumber Paragraphs boxes are checked; Under "Reports" a Section Table of Contents (Include Without Scope and Combine sections and section tables of contents), and Reference Verification, Submittal Verification, Reference Verification, Submittal Verification, Bracket Verification, Section Verification and Submittal Register boxes are checked; Under "Options" Section Dates shown, Units of Measure as English, Tags are Hidden, Notes are hidden, Revisions are hidden, Start Page Numbering with "1", and Restart for each section box is checked; and Under "Header/Footer" jobtitle and jobname as a Header and Section number and Page number as a footer (similar to format shown on this section of the
(2) Drawings shall be submitted in Electronic Media (AutoCAD 2014) on CD-ROM as well as paper copies.

(3) Electronic and an actual color boards are not required if there are no changes from the previous design submittal. If only minor changes are required, resubmit the electronic color boards and color legend in addition to submitting applicable coded samples (with tape ready for application) and corrected color legend for the actual color board. If major changes to the color board are required, resubmit the electronic and actual color boards with color samples of all proposed exterior and interior finishes and revised corrected color legend. As required, note that electronic color boards shall be included in each submittal and the requirement for the actual color boards are indicated by a quantity number in the submittal distribution.

3.8.1.6 Construction Set Distribution

See paragraphs above explaining Submittal Abbreviation Codes and Activity Distribution Addresses. The number of copies required for each submittal item are listed below.

<table>
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<tr>
<th>Activity</th>
<th>CENWO-PM-M</th>
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<td>Color-Board (3)</td>
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CONSTRUCTION SET SUBMITTAL NOTES:

* - Reviewers not requiring a hard copy of the items included on the electronic media.

Specific Submittal requirements are addressed in Section 01 33 00.32 and 01 33 00.38.

(1) Copy shall be the same as the 100 percent Corrected submittal and incorporate any additional comments made to 100 percent corrected design submittal.
(2) Each drawing sheet shall be stamped (P.E.) by the appropriate Designer.
(3) All Electronic Media Drawings in AutoCAD 2014 format shall be included on the 'EMedia' CD or DVD in addition to all other Electronic Media documents.
(4) The Contractor shall e-mail a copy of the ECI per requirements stated in this section.
(5) Submitted Items shall reflect all changes made through accepted 100 Percent Corrected Design.

3.8.1.7 As-Built Submittals

See Section 01 78 39.00 24, AS-BUILT DRAWINGS for requirements.
3.8.2 Review Comments:

For each design review submittal, the Contractor will be furnished comments from Omaha District and other agencies involved in the review process approximately 21 days after receipt, unless indicated otherwise. Review conference for the 60 Percent and 100 Percent Design submittals will be held approximately 30 days after government receipt of documents. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he/she shall clearly outline, with justification reasons for noncompliance at the design review conference in order that the comments can be resolved. Annotated comments, including the disposition of all comments shall be furnished in writing by the Contractor within five (5) days of the review conference and shall be recorded in the Contractor prepared Meeting Minutes described in paragraph 3.7.6.1. The written documentation shall be forwarded in the same quantities to the distribution list shown in paragraph: "Distribution of Design Documents for Conformance Review" above.

The Government will review the 100% Backcheck Review Documents for a period of fourteen (14) days after receipt of the documents. After this review, a formal letter will be sent to the Contractor allowing him to commence construction or rejecting the submittal.

Any backcheck review comments made by the indicated Government agencies to the 100 percent Corrected Design Submittals shall be resolved prior to distribution of Construction Set documents. The Contractor shall furnish copies of Annotated backcheck review comments indicating disposition of all comments with the Construction document set.

3.8.3 Review Comments

For the review of submitted design documents, Government Agencies will forward review comments for discussion and resolution to the Contractor. For each review conference, the Contractor shall provide adequate copies of annotated comments to all conference participants. Unresolved comments and problems will be resolved by immediate follow-on action at the end of conferences. Valid comments will be incorporated. After receipt of final corrected design documents upon incorporation of all backcheck comments (as many backchecks as are deemed necessary by the Government will be conducted), the Omaha District will recommend acceptance to proceed with construction. The Government intends to utilize the Dr. Checks review system, which is available at: https://www.projnet.org, for processing review comments and responses. Access rights will be provided to the Design-Build Contractor after contract award. The Government reserves the right to not accept design document submittals and withhold design payments if comments on any design document submission are of too great a significance. If final submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of $2000.00(for each design discipline requiring resubmittal) per submittal. "Design Disciplines" in this paragraph consist of Architectural, Structural, Interior Design, Mechanical, Electrical, Civil/Site work, and Fire Protection.

3.8.4 Delays

Delays caused by the Contractor in completion of the 60 percent design, the 100 percent design or the 100 percent corrected design will not be
considered as valid reasons to delay completion of the entire design. The Government may not be held liable for delays caused by re-submittal efforts caused by designs submitted which are rejected by the reviewers.

3.8.5 Reproduction (For Construction):

Upon the Government's completion of the review of the 100% Corrected Design submittal, the Contractor shall reproduce copies of the design documents (accepted for the purposes of beginning construction), subject to the incorporation of the Corrected 100% design review comments. The Cover Sheet of the Contractor prepared drawings shall bear the stamp or seal and signature of the registered architect or appropriate engineer responsible for the work and proposed to meet the RFP requirements. The date on each drawing shall reflect the month and year that the drawings were cleared for the purposes of beginning construction. The Cover Sheet of the drawings, Cover Sheet of the Specifications, and Cover Sheet of the Design Analysis shall include the date that the design documents were cleared for the purposes of beginning construction. The Contractor shall provide corrected 100 percent specifications in both hard copy and electronic media (Specsintact Software Version as noted above or later). Distribution shall be as indicated above. The originals will be retained by the Contractor for recording of as-built conditions. Upon completion of the project, the accepted design documents corrected to reflect as-built conditions shall be supplied to the Government. See Section 01 78 39.00 24 AS-BUILT DRAWINGS for as-built drawing requirements.

3.8.6 Government Design Review and Acceptance

3.8.6.1 Design Review Conference and Post-Design Review Conference Minutes:

All design review conferences shall be held at Buckley AFB, Colorado. Government personnel will forward review comments to the Contractor for discussion and resolution prior to the design review conference. For each review conference, the Contractor shall provide copies of annotated comments to all review conference participants. Unresolved comments and problems will be resolved by immediate follow-on action at the end of the conferences. Valid comments will be incorporated. Upon satisfactory Government review of the 100 percent corrected design documents, the Omaha District will formally provide Government acceptance necessary to initiate construction. The Government reserves the right to not accept design document submittals and to withhold design payments if comments are of too great a significance. If final design submittal(s) are incomplete or deficient, requiring correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of $2000.00 (for each design discipline requiring resubmittal) per submittal. For each review conference, the Contractor shall submit to the Contracting Officer within five (5) calendar days, an electronic copy of meeting minutes summarizing major decision points and issues which require resolution. Annotated comments shall be attached to these minutes.

3.8.6.2 100% Corrected Design Documents

The Contractor shall submit complete design documents in the same quantity and to the same offices listed above in paragraph "100% Corrected Design Distribution", for each corrected 100 percent design submittal (one or more) until the Government is satisfied that all review comments have been addressed and resolved.
3.8.6.3 Accuracy and Completeness of Design

Reviews by the Government of the design documents shall not be construed to be an endorsement of the accuracy or completeness of the design. Design deficiencies or omissions in the accepted design shall be the responsibility of the Contractor.

3.8.6.4 Responses to Review Comments

In responding to review comments presented by the Government, the Contractor's designer shall state how and where comments were addressed.

3.8.7 DD Form 1354, Transfer and Acceptance of Military Real Property

The Contractor shall prepare and provide, for acceptance, a completed DD Form 1354 "Transfer and Acceptance of Military Real Property" (Copy attached at the end of this section) with the 100 percent corrected design documents. DD Form 1354 shall be filled out in accordance with attached Instructions and Army Pamphlet 415-28 "Guide to Army Real Property Codes" (Copy dated 07/10/2013 is available at the following website: http://www.apd.army.mil/ (Search for "415-28")). A copy of these documents will be furnished to the successful offeror upon request. The deliverable consists of an electronic and hard-copy of the DD 1354. The number of copies of the completed DD Form 1354 is noted above.

3.9 REVISIONS TO THE ACCEPTED DESIGN

3.9.1 Minimization of Design Revisions

The accepted design will be used by all parties involved in construction and in administration of the contract. Therefore, it is imperative that the design documents be kept up to date and an effective system of making and distributing changes be implemented. Since changes to the design increase risk of construction errors and deplete available administrative resources, every effort shall be made to minimize revisions to the accepted design. One of the measures of the Contractor's effectiveness of management will be how well the goal of minimizing changes to the accepted design is met. The use of effective quality control during design, and utilization of experienced and capable designers are some of the means that are expected to be used to accomplish this goal.

3.9.2 Supplemental Design Package and Certification

If revisions to the accepted design (Construction Set) become necessary, the Contractor shall submit a Supplemental Design Package using Attachment B "Supplemental Design Certification and Transmittal Form" attached at the end of this specification section. This Supplemental Design Package shall be submitted as a "G-DO" construction submittal in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. The revisions will be considered a "Variation" and the list of deviations from the accepted design shall be identified on the Supplemental Design Certification and Transmittal Form and on the construction submittal form ENG Form 4025-R. Variations from the Construction Set must be approved by the Contractor's Designer and Contractor's Quality Control Representative and accepted by the Contracting Officer as conforming with the RFP before construction of items affected by these revisions can commence. The Contractor shall comply with all the requirements of paragraph "VARIATIONS" of Section 01 33 00 SUBMITTAL PROCEDURES in preparation of the Supplemental Design Package.
Attachment A - DESIGN CERTIFICATION AND TRANSMITTAL LETTER

[Contractor's Letterhead]

[Date: ________________]
[Contract No. ____________]

[Reviewing Component Address]

Subj: DESIGN CERTIFICATION AND TRANSMITTAL LETTER

[Project Title ____________________]
[Project Location _________________]
[Contract No. _____________________]

Greetings:

Enclosed are the following documents, which I hereby certify are in compliance with the RFP requirements of the subject construction contract and can be used to commence construction subject to Government Conformance Review:

1. Design Drawings

2. Project Specification

3. Design Analysis
   a. Civil
   b. Water Supply and Wastewater Collection
   c. Architectural
   d. Interior Design
   e. Structural
   f. Mechanical
   g. Fire Protection
   h. Electrical
   i. Communications
   j. Environmental Protection, Compliance and Permits
   k. Health and Safety
   l. Sustainable Design

4. Submittals Register

5. All other Design Deliverables

6. Deviations (List of Deviations with Justification Attached)

[Typed Name and Signature of an Officer of the Contractor's Company]

Copy to:
[As standard with the Contractor]
Attachment B - SUPPLEMENTAL DESIGN CERTIFICATION AND TRANSMITTAL FORM

[Contractor's Letterhead]

[Date: ________________]
[Contract No. ________________]

[Reviewing Component Address]

Subj:  SUPPLEMENTAL DESIGN CERTIFICATION AND TRANSMITTAL FORM
[Project Title ____________________]
[Project Location _________________]
[Contract No. _____________________]

Greetings:

The supplemental design items listed below and the attached documents, unless identified otherwise, I hereby certify are in compliance with the RFP requirements of the subject construction contract and are compatible with other elements of work, subject to Government conformance review:

1. Nature and Features of the Design Variation(s):

2. Why the each Design Variation is desirable and Beneficial to the Government:

3. List of any additional Deviations from the RFP:

4. List of Specific Documents Supporting Design Variation(s):

   a. Design Drawings

      (1) Sketches:
      (2) Reissued Drawings:
      (3) Descriptive Changes:

   b. Project Specification

      (1) Reissued or New Sections:
      (2) Descriptive Changes:

   c. Design Analysis

      (1) Reissued Pages:
      (2) Reissued or New Calculations:

   d. Any other Design Deliverable:

      [Typed Name and Signature of an Officer of the Contractor's Company]

Copy to:
[As standard with the Contractor]
ATTACHMENT C  SAMPLE SUBMITTAL PARAGRAPH

The below listing is an example of a typical submittal paragraph as it may appear within the technical guide specifications and with the appropriate text for the submittal review designations, G-DO, G-AO, or FIO (blank).

1.4_ SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fire Sprinkler Design Drawings; G-DO

SD-03 Product Data

Meters

Regulators

SD-08 Manufacturer's Instructions

Dielectric Unions

Pressure Reducing Valves

SD-10 Operation and Maintenance Data

Wet Pipe Sprinkler System; G-AO

-- End of Section --
## Transfer and Acceptance of DoD Real Property

The public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters Services, Executive Services Directorate, Information Management Division, 4800 Mark Center Drive, Alexandria, VA 22350-3100 (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

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### Statement of Completion

The facilities listed hereon are in accordance with maps, drawings, and specifications and change orders approved by the authorized representative of the using agency except for the deficiencies listed on the reverse side.

### Accepted by (Typed Name and Signature)

25 a Accepted by (Typed Name and Signature)

### Date Signed (YYYYMMDD)

25 b Date Signed (YYYYMMDD)

### Title (Area Engr./Base Engr./DPW/Construction Agent)

25 c Title (DPW/RPAO)

### Property Voucher Number

26 Property Voucher Number

**DD Form 1354, APR 2013**

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**Remarks:**

- See Item 28
- 1 EA, 150 KW Generator
- See Item 28
- 1 EA 150 KV Transformer
- See Item 28
- 2 EA COMM Manhole
- 1 EA

**Construction Deficiencies:**

- See Item 28

**Page of Pages:**

DD Form 1354, APR 2013
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<td>Includes 1EA (2 hose) MOGAS dispenser, fuel-dispensing island and 335LF of 2&quot; flexible fuel pipe.</td>
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<td>Includes 1EA (2 hose) E-85 dispenser, fuel-dispensing island and 241LF of 2&quot; flexible fuel pipe.</td>
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<td>Includes 1EA (2 hose) bio-diesel dispenser, fuel-dispensing island and 207LF of 2&quot; flexible fuel pipe.</td>
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<td>Includes 1078SF fuel station control facility with office, toilet, mechanical/electrical room and communications room</td>
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<td>#14</td>
<td>Includes 1265LF of FE6 fence and fence grounding</td>
</tr>
<tr>
<td>#15</td>
<td>Includes 3EA 30' sliding gates with motorized openers and 1EA 3' pedestrian gate</td>
</tr>
<tr>
<td>#16</td>
<td>Includes 5010SY of 7' unreinforced concrete pavement, 1120SY of 8' reinforced concrete pavement and 745 LF of concrete curbing</td>
</tr>
<tr>
<td>#17</td>
<td>Includes 200SF equipment pad for generator and 100SF equipment pad for transformer</td>
</tr>
<tr>
<td>#18</td>
<td>Includes 460LF of 15&quot; RCP pipe, 490LF of 6&quot; ductile iron pipe, 90LF of 6&quot; PVC pipe, 985LF of 6&quot; perforated PVC pipe, 410LF of 4&quot; perforated PVC pipe, 2EA manholes, 2EA area inlets and 12LF of trench drain</td>
</tr>
<tr>
<td>#19</td>
<td>1EA concrete spill containment basin</td>
</tr>
<tr>
<td>#20</td>
<td>Includes 75LF of 6&quot; ductile iron pipe, 100LF of 2&quot; ductile iron pipe</td>
</tr>
<tr>
<td>#21</td>
<td>Includes 280LF of 6&quot; PVC pipe, 46LF of 4&quot; PVC pipe and 2 manholes</td>
</tr>
<tr>
<td>#22</td>
<td>Includes 15EA light poles and 1485LF of wiring</td>
</tr>
<tr>
<td>#23</td>
<td>Includes 115LF of 480V secondary service in 2@4&quot; PVC duct bank and 100LF of 480V generator feeder in 2@4&quot; PVC ductbank</td>
</tr>
<tr>
<td>#24</td>
<td>Includes 650 LF of communications ductback 2@4&quot; PVC duct bank, with 650 LF of innerduct, 12 fiber and 25 pair cable</td>
</tr>
</tbody>
</table>

**Instructions**

GENERAL. This form has been designed and issued for use in connection with the transfer of military real property between the military departments and to or from other government agencies. It supersedes ENG Forms 290 and 290B (formerly used by the military departments relative to the preparation of DD Form 1354 are applicable to this revised form to the extent that the various items and columns on the form). For detailed instructions on how to fill out this form, please refer to Unified Facilities Criteria (UFC) 1-300-08, dated 16 April 2009 or later.
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SECTION 01 33 00.36

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5/07

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PART 1 60 PERCENT DESIGN SUBMITTALS

For general submittal requirements, See Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.1 REFERENCES

U.S. DEPARTMENT OF DEFENSE (DOD)

MIL-HDBK 1190 Facility Planning And Design Guide
UFC 1-200-01 DoD Building Code (General Building Requirements) (20 June 2016)
UFC 3-600-01 Fire Protection Engineering for Facilities (8 August 2016)
UFC 4-021-01 Design and O&M: Mass Notification Systems (January 2010)
AF ETL 11-18 Small Arms Range Design and Construction (19 April 2011)
AF FC 4-179-03F Air Force Indoor Small Arms Firing Range (1 April 2015)
UFC 3-240-07FA Sanitary and Industrial Wastewater Collection

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)


1.2 CIVIL/SITE

1.2.1 DRAWINGS

1.2.1.1 Location Plan and Vicinity Map

A Vicinity Map consists of a small scale drawing of the project location, similar to a road map. A Location Plan consists of a small scale drawing showing the Government property or reservation limit with the construction project site shown. The drawing shall show the facility approved Contractor Access and Haul Routes. A reproducible base sheet, if available, may be provided by the Omaha District for the Contractor's use in preparing the Location Plan.
1.2.1.2 Survey Plan

The information depicting existing conditions used to generate site drawings shall be shown on this drawing. An engineering survey of the site will be presented to the Contractor selected as a result of this RFP process. Any additional survey information required by the Contractor for design above that shown in the prepared engineering survey shall be procured and paid for by the Contractor.

1.2.1.3 Removal Plan

The removal plan will show the existing physical features and condition of the site before construction. This information should include the field survey to show all above and below ground utilities; buildings, drives, roads and parking areas, walks, and vegetation; and such facilities as retaining walls, underground storage tanks, foundations, etc. Each physical feature to be removed shall be as indicated on the standard legend sheet, a legend on the removal plan, and properly noted: to be removed, to remain, or to be relocated.

1.2.1.4 Site Plan

The Site Plan shall show all the site layout information necessary to field locate the building, walks, parking lots, and all other appurtenances to be constructed on the project. All site related work to be constructed will be located by dimensions. The Site Plan will identify all site related items such as: curbs, pavements, walks, plazas, seating areas, bollards, trash enclosures, retaining walls, chiller units, electrical transformers locations, etc. in accordance with a standard legend sheet or with additional legends or notes. Site Plans shall be at a scale of 1 Inch = 20 Feet or 1 Inch = 40 Feet. Other drawing scales must be approved by the Omaha District. North arrows shall be oriented the same direction on all plan sheets and by all disciplines. No existing or proposed contours shall be shown on this Plan. The Site Plan, prior to adding the dimensions, should serve as the base sheet to the other Plans, such as: Utilities Plan, Grading and Drainage Plans and Landscape Plan. The Site Plan shall show all existing physical features and utilities within and adjacent to the work site that will remain after the proposed construction has been completed. This plan will also show any free zones, construction limits, and storage areas etc. Whenever the Site Plan occupies more than one sheet of drawings, a Key Plan shall be included. Additional plans showing specific areas of the site in smaller scales can be included if more detail is necessary.

1.2.1.5 Grading and Drainage Plan

A preliminary grading and drainage plan shall be provided at the same scale as the site plan (1 Inch = 20 Feet or 1 Inch = 30 Feet). Other drawing scales must be approved by the Omaha District. Tentative new and existing grading contours shall be indicated at 1-foot contour intervals. Indicate finished floor elevation of the new buildings. Plans shall show layout of the new and existing storm drainage systems. Uniform grades shall be labeled using slope arrows. Provide spot elevations at building corners, parking area corners, changes in grade, etc. Provide location and description of benchmarks and indicate vertical and horizontal datums.

1.2.1.6 Grading Sections

Provide grading sections through the site showing finished and existing
grades, pavement sections in detail, slope percentage, ditches, etc.

1.2.1.7 Typical Pavement Sections

Provide typical pavement and road sections and details showing interface between new and existing pavements and new pavements of different sections.

1.2.1.8 Site Furnishing Details

The Contractor shall provide designs and details as necessary for site furnishings and accessories.

1.2.1.9 Landscape Plan

A Landscape Plan is included in the drawing set to serve as a guide in preparing the final contract drawings. A detailed Landscape Plan showing trees, shrubs, ground covers, seeded and sodded areas, shall be prepared by the Contractor. The Landscape Plan shall be prepared by a fully qualified, experienced professional Landscape Architect. The Contractor shall specify types of plant materials that are locally grown, commercially available and acclimated to the project environment. The Landscape Plan shall include a plant material schedule. This schedule shall include botanical names, common names, size the method of planting and remarks. The Landscape Plan shall also show all unsurfaced ground areas disturbed by construction within the project limits with these areas shown to be seeded, sodded, and/or mulched as required.

1.2.1.10 Landscape Details

The Contractor shall verify the methods of planting to meet the project site/installation requirements and provide the necessary Landscape Details to perform the contract design work. Details shall reflect local practices and conditions for installation. The Contractor shall provide designs and details as necessary for other required site furnishings and accessories.

1.2.1.11 Sprinkler Irrigation Systems

A list of applicable criteria and/or design standards shall be provided. This shall also include precipitation rates, allowable pipe material and preliminary calculations of total flow and pressure requirements. A narrative description of the system including special requirements and drip systems shall be provided.

1.2.2 SPECIFICATIONS

Provide a listing by title and number of all Technical Specifications proposed for use in the final civil/site/landscape design.

1.2.3 DESIGN ANALYSIS NARRATIVE

Design analysis shall include the following:

1.2.3.1 References

Design references used in preparing the civil/site design.

1.2.3.2 Grading

A narrative of the grading design and criteria used.
1.2.3.3 Pavements

A narrative of the pavement design and criteria used.

1.2.3.4 Drainage

A narrative of the drainage design and criteria used. Include information on the storm drain pipe materials selected and their ability to withstand earth dead loads and live loads that will be imposed.

1.2.3.5 Basis, Specific Goals, Objectives and Priorities For Civil/Site Design

The Design Analysis should give the basis for the civil/site design and should establish specific goals, objectives and priorities for civil/site design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document pollution prevention measures and other environmental considerations made during design. The 60 percent Design Analysis must be approved and accepted before Final Design.

1.2.4 DESIGN ANALYSIS CALCULATIONS

1.2.4.1 Storm Drainage System Calculations

Storm Drainage System Calculations shall include the following:

   a. Drainage area map showing boundaries of each drainage area and respective drain inlet or culvert.

   b. Storm run-off calculations for each drainage area.

   c. Preliminary storm drain pipe sizing calculations.

1.2.4.2 Pavement Calculations

Pavement thickness calculations for each pavement.

1.3 GEOTECHNICAL

See Structural Design Requirements.

1.4 WATER SUPPLY AND WASTEWATER

1.4.1 DRAWINGS

1.4.1.1 Water Distribution and Sewage Collection Systems Plan (including building services)

Provide all existing utilities and above ground features which may pose as an obstacle (i.e., water, sewer, gas, electrical, etc.) on the basic site plan layout. Exclude site notes and dimensions from the plan. Provide all proposed new water and sewer lines with preliminary sizes. This shall include all new service lines up to the 5-foot building line. Show the proposed locations of all new manholes, fire hydrants, valves (including PIV's), connection points and etc.
1.4.2 Specifications

Specifications shall be coordinated with the plans and include all items. Provide a listing of specifications to be provided. Provide a complete copy of special sections to cover those subjects for which no UFGS guide specifications are used or available.

1.4.3 Design Analysis Narrative

Design analysis shall include the following:

1.4.3.1 References

Provide design references used in preparing the water and wastewater design.

1.4.3.2 Water Supply and Distribution Systems

A narrative of the water supply and distribution systems design and applicable criteria used shall be provided. Include the peak and average domestic demands, the fire flow required and the available flow and residual pressures. A description of the water distribution system, a listing of allowable piping materials, hydrant flow test data and preliminary calculations necessary to support equipment, piping sizes, fire and domestic demands, etc., shall be provided.

1.4.3.3 Wastewater and Sewers

A narrative of the wastewater supply design and applicable criteria used shall be provided. Include the preliminary calculations used to design the average, diurnal peak, and extreme peak flows. Full flow capacity (70% of the total depth) of the existing system to ensure that it will be adequate for the flows generated by the new facility. Include the available capacity and full flow capacity in the design analysis. Preliminary calculations necessary to support equipment and piping sizes and a listing of allowable piping materials shall be provided. The design shall be in accordance with the velocity requirements of UFC 3-240-07FA.

1.5 Architectural

1.5.1 Drawings

Sixty percent architectural drawing submittal shall be a complete set of architectural drawings without large scale details. All other drawings shall be complete except referencing of the large scale details.

1.5.1.1 Floor Plans

Provide a double line Composite Floor Plan of the entire building, drawn at the largest scale practicable to include the entire building on a single sheet. This building is of a size that will require the floor plans to be divided into multiple areas. See paragraph on Drawing Scales for plan scale requirements. Floor plans shall essentially be complete with the exception of large scale detail referencing. Floor plans shall be scaled double-line drawings showing the functional arrangement, pocheing, location of all openings and plumbing fixtures, all section cuts, wall types, all notes and leaders, all general notes, and all dimensions shall be completed. The plans shall indicate door swings, door numbers and window type; door and window schedules are required. A north arrow shall be shown on each floor plan. Enlarged toilet and stair plans shall also be
included. The first composite plan sheet shall include a gross area tabulation comparing the actual square feet with the authorized square feet of the facility. Submit credentials of the Fire Protection Engineer of Record with submittal. Architect-Engineer suggestions for plan improvement shall be fully shown and justified. Include the following:

- Overall, control, and door/ window opening dimensioning.
- Match lines for combining individual portions of floor plans.
- Room names and numbers.
- Structural column or bay indicators.
- Wall and building section cuts.
- Door swings and door numbers.
- Window types.
- Area in square feet.
- General notes.

Life Safety Plans and Building Code Analysis

Also provide a Key Plan at a uniform location on all Floor Plan sheets which shows the interrelationships between the building portions. This key plan will be scaled, and oriented in the same manner as the floor plan for all plan type drawings of all disciplines. When dimensioning, use arrowheads, not dots or slashes. Where major structural elements are included as parts of architectural detailing, do not indicate sizes. These elements should all be fully defined as part of the structural design documents. Major elements of mechanical and electrical equipment affecting room size or shape, shall be shown on the architectural plans to a practicable extent and coordinated with other respective disciplines. When applicable, Government-furnished, Contractor-installed, or Government-furnished and Government-installed items shall be shown as a dashed line.

1.5.1.2 Reflected Ceiling Plans

Reflected ceiling plans shall be complete including all electrical lights, mechanical supply & diffusers, notes, complete legends and pocheing of all materials to be used. See paragraph on Drawing Scales for reflected ceiling plan scale requirements.

1.5.1.3 Roof Plan

Composite and larger area roof plans shall be complete including all notes, legends, slope indications, gutter and downspout locations, and roof overflow drains. All elements located on the roof shall be coordinated with all disciplines. See paragraph on Drawing Scales for roof plan scale requirements.

1.5.1.4 Building Elevations

Provide all building elevations complete showing the appearance and architectural treatment. Elevations shall be dimensioned to show total height, and relation to grade. Critical elevations such as top of finish floor, top of steel, etc. shall be indicated. All notes for materials shall be included. See paragraph on Drawing Scales for Exterior Building Elevation scale requirements.

1.5.1.5 Building Sections

Building cross section and longitudinal sections shall be included to show general interior volumes, construction methods, and height of ceilings and partitions. Identify materials used and necessary dimensions. See
1.5.1.6 Wall Sections

Drawings shall include all wall sections and stair section conditions including corridors, showing vertical control elevations and dimensions, with all materials labeled. The sections should normally be cut through doors, windows, and other critical wall section locations. Wall sections shall not be broken. Additional details shall be included when necessary to illustrate important or unusual features. All horizontal dimensions shall occur on the plans and vertical dimensions on the sections and elevations. See paragraph on Drawing Scales for Wall Section scale requirements.

1.5.1.7 Room Finish Schedules

Room finish schedule shall be complete in accordance with Corps of Engineers (COE) standard format.

1.5.1.8 Door, Window, and Louver Schedules

Door schedule shall be complete in accordance with Corps of Engineers (COE) standard format. Schedule shall include door and frame types, except referencing to door details and hardware sets. Window and louver schedules shall be complete including window and louver types except referencing to details.

1.5.1.9 Fire Ratings

Wall ratings, and fire hazards shall be clearly indicated as required by Fire Protection criteria. Wall fire ratings shall be graphically shown by a continuous symbol or pocheing within the wall on a Fire Protection /Life Safety Plan. When other functions coexist with the fire protection functions, their integration shall be clearly indicated, with an analysis that describes how both functions will be served. Provide a separate, composite type floor plan which makes an accurate presentation of these various features and functions.

1.5.1.10 Drawing Scales

Architectural work shall be drawn at the scales listed below. Other scales may be used only by written authorization through the Project Architect, Omaha District. Units of measurements shown on the drawings shall be done in English units. All disciplines should use the same scale for plan sheets. The following is a comparison guide to establish equivalent scaling of drawings:

<table>
<thead>
<tr>
<th>Composite Plans (Note 1)</th>
<th>ENGLISH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor Plans</td>
<td>Varies</td>
</tr>
<tr>
<td>Reflected Ceiling Plans</td>
<td>1/4-Inch = 1'-0&quot;</td>
</tr>
<tr>
<td>Detail Plans (Note 2)</td>
<td>1/8-Inch = 1'-0&quot;</td>
</tr>
<tr>
<td>Roof Plans</td>
<td>1/2-Inch = 1'-0&quot;</td>
</tr>
<tr>
<td>Exterior Elevations</td>
<td>1/8-Inch = 1'-0&quot;</td>
</tr>
<tr>
<td>Interior Elevations</td>
<td>Same scale as plan</td>
</tr>
<tr>
<td>Interior Toilet Elevations</td>
<td>1/2-Inch = 1'-0&quot;</td>
</tr>
<tr>
<td>Building Cross Sections</td>
<td>1/4-Inch = 1'-0&quot;</td>
</tr>
<tr>
<td>Wall Sections</td>
<td>3/4-Inch = 1'-0&quot;</td>
</tr>
<tr>
<td>Stair Sections</td>
<td>3/4-Inch = 1'-0&quot;</td>
</tr>
</tbody>
</table>
Details (Note 2)                            3-Inches = 1'-0"
Wall Types                                  3/4-Inch = 1'-0"
Fire Protection Plans (Note 1)              Varies

Notes:

1. Scale of composite plan shall be as required so that the entire facility is drawn on one sheet without break lines.

2. The goal of this requirement is that the details be large enough to show all fixtures, accessories, equipment, materials, manner of construction, clearances required for proper maintenance, and complete dimensions. Toilet rooms and Equipment rooms are examples of the kind of spaces which shall be drawn as a Detail Plan.

1.5.1.11 Legends

Standard architectural material symbols used on the drawings shall be provided as a separate architectural legend drawing. Additional material symbols should be added to the Legend Sheet as needed for the project.

1.5.1.12 North Arrows

North arrows shall be oriented the same direction on all plan sheets and by all disciplines; including site and civil drawings. Plan north shall be "up" or the left on the drawings. Indicate true north on composite plan drawings. North arrows shall be located approximately at the same location on all sheets.

1.5.1.13 Modular Design

Modular Design practices shall be followed in the design of all masonry buildings or components of buildings. Dimensions shall be figured to whole or half-unit lengths of standard units in order to reduce on-site cutting of masonry.

1.5.1.14 Symbols

The Room and Door Numbering system shall be consistent. The standard symbols for Amendments (a triangular box) or Modifications (a type of circular box, see the chapter on Drafting Criteria) to the contract shall not be used for any other purpose, and care must be taken to avoid using even similar appearing but technically different symbols. Room numbering shall start at the main entrance and proceed clockwise around functional areas.

1.5.1.15 Schedules

Schedules for room finish, doors, windows, louvers, etc., shall be clear and complete. As many columns as necessary should be provided in order to present the essential information. The "Remarks" column should not be used as a substitute for an information column. Normally a single item should be presented on each schedule line. Other scheduling methods as standard with the A-E may be used if approved by written authorization from the Project Architect, Omaha District.
1.5.1.16 Notes

Notes may be placed on drawings to reduce the amount of repetitive drafting, provided that clarity is not lost. General notes should be placed at the right-hand edge of the sheet and, if possible, should be located on the first sheet in the set. Notes that pertain to each drawing however, should be placed on each drawing.

1.5.1.17 Dimensions

Dimensions must be complete, accurate and fully coordinated. Dimensions should be to points easily measurable in the construction, and should be laid out to eliminate refiguring in the field. Dimensions should be tied-in to column lines, etc., to facilitate checking. Plan dimensions for frame construction should be to face of stud for exterior walls, to one face of stud for interior partitions, and to centerline of openings. For masonry construction, dimensions should be to one or both nominal faces of masonry and to jambs of openings.

1.5.1.18 Facility Elevation

The level of finished floor shall be indicated as EL.= 100 000. Elevations for footings, etc., shall be related to this figure. Sea level elevations shall not be shown on the building drawings.

1.5.1.19 Access to Utilities

All utilities within the building, such as piping, ductwork, electrical work, etc., shall be concealed in finished areas. Provide plumbing chases in toilet areas. The clear space above ceilings and the size of chases must be carefully figured to accommodate piping slopes and connections, ductwork crossovers, and similar situations. Access must be provided to valves, cleanouts, etc. Space provided for utilities systems must be adequate but should not be excessive.

1.5.1.20 Reflected Ceiling Plans

Reflected Ceiling Plans shall be provided for all spaces in the building. Reflected ceiling plans shall show the ceiling tile layout and location of gypsum wallboard and other ceiling types where applicable. All light fixtures, air diffusers, grilles, registers, PA speakers, sprinkler head layout, smoke and heat detectors - if ceiling mounted, and other ceiling mounted items will also be shown on the reflected ceiling plans. The fixtures and other equipment shall be laid out in a regular pattern symmetrical with the ceiling tile grid, or symmetrical with the room centerlines, columns, windows, or other feature that dominates. All ceiling mounted items shown shall be fully coordinated with all other disciplines.

1.5.1.21 Sketches

All sketches presented during the design phase shall be reduced to 8-1/2" by 11" and included in this design analysis to document the design options and decisions evaluated during the design process.
1.5.2 SPECIFICATIONS

1.5.2.1 Use of Technical Guide Specifications

Unified Facilities Guide Specifications (UFGS) are prepared by the Corps of Engineers to achieve the maximum uniformity in contract specifications. The UFGS describe the type and quality of material and installation normally acceptable for Corps construction, and often represent specific agreement between the Corps and the applicable industry. The provisions of the technical guide specifications should not be changed without justification. The 60% submittal shall include a draft edited specifications of all the applicable sections. Items added or deleted in these specification sections shall be evident. Complete descriptions including specific size, gauge, and configuration are included in the UFGS for a wide variety of items. The designer must be familiar with the UFGS requirements in order to provide details fully coordinated with the technical specification descriptions. Terminology used on the drawings shall be the same as used in the UFGS. Where it is desirable to detail a variance with the standard provisions of the UFGS, the specifications must be revised to coordinate with the details. New guide specifications shall be limited to those specialty type items not covered in the regular sections of UFGS.

1.5.3 DESIGN ANALYSIS NARRATIVE

The Design Analysis shall be essentially complete with emphasis on the following:

1.5.3.1 Basic Criteria Statement

A statement indicating the basic criteria to be applied to the design including type of construction (noncombustible, etc.), category of construction (permanent, etc.), major fire protection and exit requirements, etc..

1.5.3.2 Description of Materials

A description of materials for all major building components and of all interior and exterior finishes ascertaining their matching of existing. The description of materials must include type of exterior wall construction, room finish schedule, window types, panel materials, etc. The description of materials should follow the continuity of the MIL-HDBK 1190. The description of finishes may be presented in schedule form.

1.5.3.3 Additional Criteria/Clarification

A list of items on which additional criteria, clarification, or guidance is required.

1.5.3.4 Reason for Selection

The written presentation must include the designer's reasons for selecting specific materials, architectural compatibility, and architectural treatment in all cases in which the reason for selection is not obvious.

1.5.3.5 Site Adaptation of Standard Drawings

Site adaptation of standard drawings shall include the following in the
design analysis.

a. An outline of the selections made where the standards permit the designer a choice of design or material.

b. An outline of items on the standard that do not conform to current criteria or to the design instructions, and suggested methods for changing the standards.

c. An outline of errors found in the standards and suggested methods for correction.

d. An outline of improvements the designer feels should be made to the standards, with full explanation and justification.

1.5.3.6 General Parameters

The design analysis shall follow the format described herein.

a. The purposes, overall functions, and total capacities of the facility.

b. The design theme or visual appearance of the exterior and interiors of the building, and how this facility coordinates with the image criteria of the installation on which it will be constructed.

c. The number of personnel to use facility.

d. The type of activities and equipment involved.

e. The anticipated life of the functions to be accommodated.

f. The category of construction; permanent

1.5.3.7 Functional and Technical Requirements

a. Functional areas, occupant capacities, and allocation, including a functional relationship matrix.

b. All items of equipment, required.

c. Occupational safety and health.

d. Handicapped accessibility.

e. Energy conservation energy budget goals.

f. Sound and vibration control.

g. Interior service areas.

h. Physical security; lock and keying, intrusion-detection, alarms, restricted access areas, interior guard support, and ties to local authorities.

i. Justification for selection of exterior and interior finishes and materials.

j. Moisture Vapor Control.
k. Lessons learned incorporated into the design.

1.5.3.8 Design Objectives and Provisions

a. Adaptation of the building to the size, shape, and orientation of the site.

b. Building layout to establish convenient circulation flows during normal operation and emergency evacuation activities, for materials, equipment, services, and people.

c. Grouping spaces into sound-compatible zones and protective construction zones, e.g., for fire and storm.

d. Space layout compatible with modular (structural and environmental) support systems.

e. Type of construction materials, architectural systems, and finishes.

f. Building expandability/changeability.

g. Physical security.

h. Barrier-free design.

i. Energy conservation. (insulation, orientation)

j. Acoustical design.

k. Moisture vapor condensation design.

l. Composition of masses and spaces architectural compatibility and architectural details to reflect the design theme and desired image, and the scale and nature of the activities involved.

m. Perception of the building details and volumes. (Specific provisions made, e.g., an identifiable sequence of viewing positions for experiencing the interior and exterior architectural design.)

n. Enhancement of materials and systems maintenance and operation.

o. Economy of building construction, operation, and maintenance: life-cycle cost effectiveness.

1.5.3.9 Coordination with Installation or Outside Agencies

a. Physical security support.

b. Occupational safety and health, as required.

c. Government furnished equipment.

d. Operations and maintenance support.

1.5.3.10 Checklists

Fire Protection Code Analysis and Handicapped Checklist shall be included in the Design Analysis.
1.5.4 DESIGN ANALYSIS CALCULATIONS

a. Net room areas, occupant capacity and gross building areas.

(Categorize areas and capacities under the titles of "Operational Space Requirements", "Administrative Space Requirements", "Storage Space Requirements", and "Support Space Requirements".)

b. U-values for each wall, window, door, or roof type studied or selected.

c. Acoustics.

d. Rainfall intensity relative to roof area and roof drain size and number calculations.

1.6 INTERIORS

1.6.1 DESIGN ANALYSIS NARRATIVE

The design analysis shall contain an explanation of the desired image or visual appearance of the interior of the facility and the design intent.

1.6.2 DRAWINGS

A furniture footprint indicating proposed furniture layout shall be incorporated into the drawings. Drawings shall be at 1/4" = 1'-0" scale. Identify on drawings if furniture is not in contract.

1.6.3 SPECIFICATIONS

Appropriate UFGS guide specifications shall be provided and coordinated with the drawings and design analysis. Color requirements shall be specified in Section 09 06 00 Schedule of Finishes. Specifications shall be edited to identify proposed product and installation requirements. Where materials or installation requirements are not covered in the provided specifications, information shall be prepared to cover these items.

1.6.4 COLOR BOARDS AND LEGENDS

Color boards shall show actual color samples of all proposed exterior and interior finishes. A color board legend shall accompany the boards and shall clearly identify all finishes. Clarification of finish placement shall be required when more than one color of a single finish is proposed. Color boards shall be 8 1/2" x 11" in size and provided in a three ring binder. Include project name and location, design stage and date on the front cover and spine of the binder.

1.6.5 FURNITURE, FIXTURES AND EQUIPMENT (FF&E)

Per UFC 3-120-10 INTERIOR DESIGN submittal requirements, provide a 65% design. Include an Item Code Legend, not an Item Installation List.

1.7 STRUCTURAL

1.7.1 DRAWINGS

Drawings shall include roof and floor framing plans, floor slab plans and foundation plans. Roof and floor framing plans shall show sufficient
details to clearly indicate the type of framing system used, size and spacing of members and their elevations. The location of all columns or pilasters shall be shown, and all building structural members shall be at least outlined. The sizes, locations and elevations of footings shall be shown. Slab plans shall be coordinated with the Architectural sheets and shall indicate the locations of structural walls and partitions, recessed slabs and contraction or construction joints. Concrete slab-on-grade thicknesses and sections shall be shown. Proposed treatment of special footings and unique or complex features and details shall be shown on the drawings. Elevations views, sections and details necessary to illustrate the design at a 60% level of completion shall be provided. Drawings shall also include overall building plan dimensions, north arrows, and design notes. Drawings shall be at done at a scale appropriate for the design, in no case however, shall plan type drawings be done at a scale smaller than 1/8" = 1'-0" or detail type drawings at a scale smaller than 1/2" = 1'-0".

1.7.2 SPECIFICATIONS

For this 60% design submittal the Contractor shall provide a listing by title and number of all Technical Specifications proposed for use in the final structural design. Identify special sections that are to be developed.

1.7.3 DESIGN ANALYSIS NARRATIVE

Design analysis shall follow the format described in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES, Paragraph 3.3, "Design Analyses" and the specific content shall be essentially as outlined below.

1.7.3.1 Design Criteria and References

A list of design criteria references, such as DOD Unified Facilities Criteria, Department of the Army Technical Manuals, ACI Standards, AISC Specifications, etc., and any other references which were used in the design of the project shall be included in the narrative.

1.7.3.2 Design Loads and Conditions

A list of structural design loads and conditions shall be provided, including:

- Snow load parameters;
- Wind load parameters
- Seismic design parameters;
- Roof live loads;
- Floor live loads, identifying each loading with usage and the room or space where used;
- Foundation design criteria, including the design depth for footings, allowable soil bearing pressure, equivalent fluid densities (or lateral earth pressure coefficients) for the design of earth retaining structures and building components, modulus of subgrade reaction, and any other pertinent data derived from the recommendations of the Final Geotechnical Investigation Report.

1.7.3.3 Structural Materials

A list of structural materials shall be provided, together with the stress grades and/or ASTM designations, as applicable, for structural steel, concrete, and reinforcing steel; the series for steel joists; and
identification of the proposed use of each material in the structure.

1.7.3.4 Description of the Structural System

A concise description of the proposed structural system for the building, together with the reasons for its selection, shall be provided. All principal elements of the structural system selected shall be described. Typically, these shall include:

- Primary supporting members for the roof;
- Structural walls, type of material, and whether load bearing or non-load bearing, with location of load-bearing walls defined, and measures taken to compensate for expansion/contraction and crack control in masonry walls;
- The proposed system for resisting lateral forces (wind and earthquake) and transferring them to the ground, whether diaphragms, chord bracing, shear walls, braced or moment resisting frame, etc;
- Foundations, description of special designs to accommodate existing site conditions;
- Concrete slab-on-grade floors, description of floor surface finish treatment, accommodation of live loads, and the use, location and types of crack control joints;
- The proposed treatment of any unusual structural loadings, features or unique solutions to structural problems.
- Identification of any major vibrating elements and measures taken to isolate them.

1.7.4 Design Analysis Calculations

The extent of the structural calculations shall be indicative of a design which has reached a 60% level of completion. Computations shall include snow, wind, seismic, dead and live loads. Computations shall show sizing and spacing of structural members for roof and floor framing, sidewalls and foundation sizes, as appropriate to the systems to be used for these elements.

1.7.5 Final Geotechnical Investigation Report

The geotechnical investigation data, which will be included in this RFP at a later submittal, is intended for proposal preparation and final design use. The information in the Final Subsurface Investigation and Geotechnical Information Report included in the RFP represents the best available site data. Variations from the typical conditions described may exist at the site."

1.8 MECHANICAL

Compliance with the design requirements for the building mechanical systems will be determined by a review of the submitted 60 percent drawings, design analysis, and specifications. Any conflicts in the design requirements or lack of thorough understanding of the nature and scope of work shall be identified and resolved prior to submittal of the 60 percent design.

1.8.1 DESIGN DRAWINGS

The 60 percent design drawings shall be fully coordinated with the design analysis. Sufficient plans, piping diagrams, sections, flow diagrams, details, schedules, and control diagrams/sequences shall be provided as
necessary to define the required design intent. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned. Unless otherwise indicated, all floor plans shall be drawn at 1/8" = 1'-0" scale and show all room names and numbers. An exception to this are administrative areas being air-conditioned shall be 1/4" = 1'-0" scale and mechanical room plans shall be 1/2" = 1'-0" scale. Sheet reference number sequencing shall be in accordance with the National CADD Standards with Omaha District CADD requirements. Submittal drawings shall include, but not limited to, the following:

1.8.1.1 Mechanical Index Sheet

An index sheet identifying all mechanical drawings shall be provided, including those drawings anticipated to be provided in the 100 percent design submittal. Index shall include drawing design file numbers, drawing numbers, sheet numbers, and drawing descriptions.

1.8.1.2 Mechanical Abbreviation, Legend, and General Notes Sheet

This sheet shall include all mechanical abbreviations and symbols that will be used on the drawings. Symbols shall be grouped into sections; as a minimum, provide sections for Plumbing, Heating, Miscellaneous Piping, Valves and Fittings, and ventilation.

1.8.1.3 Exterior Utility Drawings

The following exterior utility drawings shall be provided:

a. Removal Plan

All existing exterior mechanical utilities and utilities which are to be removed shall be indicated on the Site Removal Plan located in the civil section of the drawing package.

b. Utility Plan:

All existing and new mechanical utilities shall be indicated on the Site Composite Utilities Plan located in the civil section of the drawing package. The location of existing exterior utilities shall be thoroughly checked and indicated on plans and profiles, thus preventing interference with new services. The utility drawing shall indicate all new utilities, including tie-in points, and existing utilities which are to be abandoned.

1.8.1.4 Plumbing Drawings

The following plumbing drawings shall be provided:

a. Plumbing Plans

Plumbing plans showing the design and tentative layout of the domestic hot and cold water distribution systems; make-up water piping; soil, waste and vent piping; and storm water drainage system shall be provided. Plans shall show all anticipated routing of piping systems from the connections within the structure to a point 5 feet outside the structure. The grade of all drain lines shall be calculated and invert elevations established. All electrical panels/equipment and pertinent HVAC equipment (expansion tanks, boilers, AHU's, pumps, lawn sprinkler system, etc.) shall be outlined in half-tone on the plumbing plans. Plans may combine building areas and be drawn at 1/8" = 1'-0" scale as long as legibility is not compromised.
Plumbing fixtures and drains shown on the drawings shall be designated by the same identification system used in the Technical Specification and Plumbing Fixture Schedule.

b. Enlarged Mechanical Room Plumbing Plan

An enlarged mechanical room plumbing plan drawn at a minimum 1/4" = 1'-0" scale shall be provided. Plan shall show layout of all plumbing equipment and piping within the rooms. In addition to all the plumbing systems required, the plan shall show half-toned outlines of all HVAC equipment located in the room, gas service, lawn sprinkler apparatus, the fire protection entrance and risers, and the outline of any electrical panels or equipment located in the room.

c. Plumbing Detail and Schedule Sheet

The following details shall be provided: water heaters, and water service entrance. The provided plumbing fixture schedule and a contractor generated water heater schedule shall be provided.

1.8.1.5 Mechanical HVAC Drawings

Show on mechanical HVAC drawings, all items of mechanical equipment, including boiler room equipment, HVAC equipment layout, air handling units, air distribution and exhaust systems, etc., to determine proper space allocation within the intent of the architectural layout requirements. Plans, elevations, and sections shall be developed sufficiently to insure that major equipment items, piping, and ductwork cause no interference with structural members, electrical equipment, etc. The following HVAC drawings shall be provided:

a. Mechanical HVAC Plans

Mechanical HVAC plans showing the design and tentative layout of the hot water piping distribution system and equipment, the air supply and distribution systems, and the ventilation and exhaust systems shall be provided. Air supply and distribution systems shall show all ductwork, including supply and return ductwork, ductwork to diffusers, and all diffusers. For the 60 percent submittal, all ductwork may be shown as single-lined. The final design submittal shall show all ductwork as double-lined. All electrical panels/equipment and pertinent plumbing equipment shall be outlined in half-tone on the HVAC plans.

b. Enlarged Mechanical Room HVAC Plans

Enlarged mechanical room HVAC plans showing all mechanical systems and drawn at a minimum 1/2" = 1'-0" scale shall be provided. Plans shall show layout of all equipment, piping, and ducts located within the rooms. Equipment shall include (but not limited to) air handling units with associated outside air intakes, relief air, and supply/return ducts; exhaust/supply fans, mechanical room ventilation intake/relief openings, gas service entrance, combustion air opening, unit heaters, HW pumps, boilers, expansion tanks, and temperature control panels. Plans shall show dedicated access space for items requiring maintenance. In addition to all the mechanical HVAC systems required, the plan shall show half-toned outlines of all major plumbing equipment, the water service entrance, fire protection entrance and riser, lawn sprinkler apparatus, and any electrical equipment or panels located in the room.
c. Mechanical Room Sections:

For each air handling unit within the mechanical room, a mechanical room section view shall be provided showing, but not limited to, all AHU components, ductwork connections/routing, and relationship to adjacent structural features.

d. Chilled Water System Flow Diagram:

Provide flow diagram showing the facility piping system including the pumps and connected chilled water equipment. Each pump and equipment item shall show associated cfm flowrate. All thermometers, pressure gauges, isolation and control valves, bypass piping, freeze protection piping, etc. shall be shown on the flow diagram.

e. Mechanical Detail Sheets:

Installation details showing all specification requirements such as isolation and balancing valves, thermometers, pressure gauges, equipment pads, strainers, vents, hangers, vibration isolation, etc. shall be provided for each item of mechanical equipment. As a minimum, the following mechanical details shall be provided to the extent they are included in the design:

- Refrigerant Piping Diagram
- Hot Water Boiler and Piping Diagram
- Chilled water piping Diagram
- Chilled water pumps
- Hot Water Pumps
- Expansion Tanks
- Horizontal Unit Heater
- Vertical Unit Heater
- Chemical Shot Feeders
- Gas Service Entrance
- Radiant Floor Heating Piping Diagram
- Radiant Floor Manifolds
- Cabinet Unit Heater
- Air Handling Units
- Wall Propeller Supply/Exhaust Fan
- In-line Supply/Exhaust Fan
- Relief Hood
- Relief Vent
- Exhaust Hoods
- Seismic Requirements for Floor-Mounted and Suspended Equipment
- Infra-red System

f. Mechanical Schedule Sheets

Schedules, with preliminary capacities, shall be provided for each item of mechanical equipment. Furnished typical equipment schedules shall be used whenever possible and shall be revised and completed as necessary to suit the project requirements. In addition to the furnished schedules, damper and control valve schedules shall also be provided.

1.8.1.6 HVAC Control Drawings

Simplified, one-line type control schematics showing all control system interface points and detailed sequence of operation shall be provided for
all mechanical equipment and systems. Sequence of operation for each item of equipment and system shall be sub-sectioned into paragraphs describing discreet operational requirements. The following drawings shall be provided:

HVAC Controls Legend:

This sheet shall include all control abbreviations and symbols that will be used on the drawings. Furnished Controls Legend sheet shall be used as a basis for all abbreviations and symbols used on the Final Control Drawings.

a. Misc Systems

These sheets shall include all miscellaneous equipment items such as supply/exhaust fans, unit heaters, radiant floor, infra-red heaters, controls air compressor, etc. that are not interlocked to the main HW or air handling unit systems. Provide control schematic and sequence of control for each item of equipment on the same sheet.

b. Hot Water System

Provide a boiler and pumping system control schematic and sequence of operation.

c. Radiant Floor Water System

Provide a manifold and zone pumping system control schematic and sequence of operation.

d. Air Conditioning System:

Provide a condensing unit, evaporator and chilled water pumping system control schematic and sequence of operation.

e. Air Handling Systems

For each air handling system, including outside air makeup system, provide a control schematic and a sequence of operation. Include all items of equipment that are interlocked to each system.

f. Control Points Lists

Provide Local Control Panel control points lists for all items of equipment and systems, identifying all anticipated temperature control system input/output points. The format for defining the input/output points shall be as identified on the furnished Example Control Point List sheets.

1.8.2 TECHNICAL SPECIFICATIONS

None of the government provided guide specifications are required to be submitted at the 60 percent design stage. However; any Contractor generated specifications required to meet the project specifics, or individual specification items added to the provided guide specifications shall be submitted for review.

The following UFGS guide specifications shall be edited and coordinated with the drawings and design analysis to identify the proposed product and installation requirements for the facility:
Proposed HVAC and Temperature Control System Performance Test and Functional Performance Checklists shall be included in the appropriate specifications.

1.8.3 DESIGN ANALYSIS NARRATIVE

The narrative portion of the design analysis shall contain a narrative description and analysis for each of the mechanical portions of the design. The basis and reasons for specific engineering decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. Design statements shall be provided in sufficient detail to enable the reviewer to get a clear picture and understanding of all included work so that approval will be granted. Narrative shall be complete relative to scope and intended design approaches. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded, and detailed at the final design stage. If alternatives were to be evaluated and selected by the designer, findings (pros and cons) and conclusions shall be included. The design analysis shall carry a complete narrative for every item and system covered in the design, and shall include, but not be limited to, the following:

1.8.3.1 Index

Provide a design analysis index identifying all main and sub-paragraph headings.

1.8.3.2 Project Summary

Provide a brief description of the mechanical design objectives.

1.8.3.3 Applicable Criteria

A list of all applicable criteria used for basis of design.

1.8.3.4 Technical Specifications

A list of Technical Guide Specifications that will be used for the project.
1.8.3.5 Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.

1.8.3.6 System Descriptions

Provide a complete description of all building systems; include the designer's reasons for selecting specific materials, systems, etc. in which the reason for selection is not obvious. System descriptions shall include, but not limited to, the following:

- Plumbing System
- Exterior Gas Distribution System
- Interior Gas Piping System
- Hot Water Heating System
- Radiant Floor System
- Exhaust Hoods
- Air Supply and Distribution Systems
- Ventilation and Exhaust Systems
- Temperature Control System
- Seismic Protection
- Chilled Water System
- Refrigeration System
- Infra-red system

1.8.4 DESIGN ANALYSIS CALCULATIONS

The Design Analysis calculations shall provide an estimate of the heating, cooling, and ventilation loads to determine a preliminary selection of the type and size of mechanical equipment to be used. Design calculations shall be provided in sufficient detail to enable the reviewer to get a clear understanding of all work to allow approval. Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials, performance of specific systems or equipment. Manufacturer's catalog data sheets shall be provided for each item of equipment selected. Calculations may be performed by manual or computerized procedures. Use of standardized charts, curves, tables, graphs will generally be acceptable for portions of required calculations lieu of specific calculation procedures. Such data must be from a recognized source which is identified in the design analysis and shall be included with the calculations. Design calculations and computations shall be provided for all systems and shall include, but not limited to, the following:

1.8.4.1 Index

Provide a design analysis index identifying all calculation items.

1.8.4.2 Design Conditions

A list of Mechanical HVAC design conditions including elevation, latitude, heating/cooling degree days, winter and summer outside design temperatures, inside design temperatures for all spaces, ventilation rates, etc. shall be provided.
1.8.4.3 Zone Air-Conditioning Loads

Preliminary cooling calculations shall be prepared using the Cooling Load Temperature Differential/Cooling Load Factors (CLTD/CLF) Method as described in the ASHRAE Fundamentals Handbook.

1.8.4.4 Block Air-Conditioning Loads

Preliminary block cooling load calculations, compassing the air-conditioned areas, shall be prepared using the CLTD/DLF Method.

1.8.4.5 Chilled Water Pump Selections

Include pump flow calculations and catalog selection data indicating dimensions, connection sizes, rpm, horsepower, and efficiency.

1.8.4.6 Heating Loads

For each area or room requiring heat; provide calculations.

1.8.4.7 Heating Load Summary

A tabular summary of all heating load calculations for each area or room, including combustion air heating, shall be provided.

1.8.4.8 Boiler Selection

Include boiler capacity adjustments for altitude, inefficiency, and net rating. Provide catalog data indicating input capacity, net output capacity, dimensions, and water and flue size connections.

1.8.4.9 Hot Water Pump Selection

Include pump flow calculations and catalog selection data indicating dimensions, connection sizes, rpm, horsepower, and efficiency.

1.8.4.10 Combustion-Air Requirements

Include combustion air quantity and free area calculations, louver selection, combustion air heating requirements, and selection of heating equipment.

1.8.4.11 Unit Heater Selections

For each area requiring a unit heater, provide data on capacity, weight, and horsepower.

1.8.4.12 Mechanical Ventilation

For each area or room requiring mechanical ventilation for cooling; provide calculations similar to zone air-conditioning, louver selection, and catalog fan data.

1.8.4.13 Toilets/Janitor Room Ventilation

Provide calculations, catalog fan data, and louver selections, for each toilet area.
1.8.4.14 Air Handling Units

A tabular summary of all airflow calculations for each area or room shall be provided on each air distribution system for fan sizing.

1.8.4.15 Domestic Water Demand

Calculations for determining the size of the domestic cold water supply line to the building shall be provided.

1.8.4.16 Domestic Hot Water Demand

The design guidance provided for service water heating in ASHRAE HA shall be followed to determine the domestic hot water demand for the facility. Provide catalog data for the domestic water heaters.

1.8.4.17 Electrical Load Summary

A summary of all mechanical equipment and the associated electrical load requirements shall be provided.

1.8.5 ENERGY CONSERVATION

Mechanical designs shall be economical, maintainable and energy conservative with full consideration given to the functional requirements and planned life of the facility. Emphasis shall be given to heat reclamation, outside air usage and other energy conservation measures for mechanical systems. Each major item of proposed mechanical equipment shall have a net efficiency rating that is equal to or exceeds the net efficiency ratings of similar or equal equipment of the four manufacturers each having one of the four highest ratings.

1.8.6 AIR POLLUTION CONTROL

Air pollution control shall be incorporated in all designs. The Architect-Engineer shall investigate the latest Using Service, Local, State, and Federal regulations and standards, analyze and report on requirements in the design analysis, and include in the design as applicable. The most stringent of all regulations and standards shall be implemented into the design. If in doubt as to requirements, contact this office for assistance.

1.9 ELECTRICAL

1.9.1 DRAWINGS

Drawing scale shall match architectural drawing requirements. Drawings shall show the following:

1.9.1.1 Lighting Layout and List of Fixtures

Complete lighting layout of all areas shall be provided. The type of fixture shall be indicated on the drawing. Complete list of fixtures proposed with type of lamp and wattage.

1.9.1.2 Receptacle Layout

Complete receptacle layout should be provided for all areas to indicate project requirements.
1.9.1.3  Power Equipment and Layout

Power equipment and layout such as switchboard, panelboards, large motor driven items, etc.

1.9.1.4  Power One Line Diagram

Power one line diagram shall be shown to indicate arrangement of the system.

1.9.1.5  Fire Detection

Fire Detection drawings shall be provided and inserted in the Fire Protection/Fire Suppression F-Series of drawings.

1.9.1.6  Miscellaneous Details of Special Equipment

Miscellaneous details of special equipment to indicate understanding of 01 86 26 ELECTRICAL REQUIREMENTS.

1.9.2  SPECIFICATIONS

Submit prescriptive specification sections to specify the quality, characteristics, installation procedures and testing requirements for all items of the proposed electrical design.

Specifications shall be provided (to approximately 60 percent completion). See Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES, paragraph 3.2, SPECIFICATIONS for additional requirements.

1.9.3  DESIGN ANALYSIS NARRATIVE

The design analysis shall contain a description and analysis of the electrical portions of the design. Special features, unusual requirements, etc., should be noted. Narrative must address all technical requirements identified in Section 01 86 26 ELECTRICAL REQUIREMENTS.

1.9.4  DESIGN ANALYSIS CALCULATIONS

Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials. As a minimum the following shall be submitted.

1.9.4.1  Service

Sizing of building services EMD (Estimated Maximum Demand) for all the building loads.

1.9.4.2  Transformers

Sizing of general purpose dry type transformers.

1.9.4.3  Feeders

Sizing of main feeders.
1.9.4.4 Panelboards

Sizing of panelboards and distribution equipment.

1.9.4.5 Illumination Calculations

Data should identify target and calculated illumination levels for all typical rooms. Calculations should be adjusted to compensate for special applications such as irregularly shaped rooms, open sides, ceiling obstructions (beams, ductwork), corridors, etc. If the lumen method is used for corridor calculations, the calculations should be performed using a module in which the length doesn't exceed 3 times the width (2:1 ratio preferred).

1.9.4.6 Short Circuit Evaluation

The maximum possible fault current at the building service should be calculated.

1.10 COMMUNICATIONS

1.10.1 Drawings

Drawing scale shall match architectural drawing requirements. Drawings shall be organized and demonstrate that the work complies with all requirements of the RFP as follows:

1.10.1.1 Outside Plant Distribution

Manhole and ductbank system layout shall show all exterior features including: quantity and sizes of ducts, manhole types, cable types and routing.

1.10.1.2 Voice and Data Plans

Complete layout of all areas and outlets shall be provided. The type of outlets shall be indicated. Cable tray, conduits and other pathways shall be shown, with sizes indicated. Racks, cabinets, and other equipment shall be shown and identified.

1.10.1.3 Riser Diagrams

Provide riser diagrams that indicate the ER, TR's risers, backbone trays and conduits, typical horizontal cabling, backbone termination areas, and service entrance configurations, and all backbone cabling (including types and counts).

1.10.1.4 Outlet Configurations

Show all unique outlet configurations, including connector types and quantities and labeling conventions.

1.10.1.5 Rack, Cabinet, and Equipment Elevations

Show typical elevations of each type of rack, cabinet, or other equipment or termination enclosures, including cable management, grounding, power, patch panels, connectors, etc.
1.10.1.6 Miscellaneous Communications Systems

1.10.1.7 Plans

Show all devices and equipment for Public Address, and CATV.

1.10.1.8 Riser Diagrams

Provide a separate riser diagram for each system, showing all major components, typical minor components (speakers, volume control, etc.) and interconnecting cabling.

1.10.2 Specifications

Submit prescriptive specification sections to specify the quality, characteristics, installation procedures and testing requirements for all items of the proposed communications design.

1.10.3 Design Analysis Narrative

The design analysis shall contain a description and analysis of the communications portions of the design. Special features, unusual requirements should be noted. Narrative must address all technical requirements identified in section 01 86 29 COMMUNICATIONS REQUIREMENTS.

1.10.4 Design Analysis Calculations

Backup data shall be furnished to support basic design decisions related to sizing of cable trays and conduits.

1.11 FIRE PROTECTION

1.11.1 DRAWINGS

Features of Fire Protection, their ratings, and the hazards requiring them, shall be clearly indicated. Sprinkler and fire alarm/detection areas shall also be clearly indicated. Fire detection mass notification and sprinkler systems shall be laid out and detailed sufficiently to indicate the designers understanding of the Section 01 86 13 FIRE PROTECTION REQUIREMENTS. When other functions co-exist with the fire protection functions, their integration shall be clearly indicated, with an analysis that describes how both functions will be served. Provide a separate, composite type floor plan which makes an accurate presentation of these various features and functions. As part of the submittal, provide a set of plans that shows emergency egress for the facility. Submit Life Safety Plan and Building Code Analysis developed by the Fire Protection Engineer of Record. Submit credentials of Fire Protection Engineer of Record with submittal. Perform hydrant flow test in accordance with NFPA before design of fire suppression system.

1.11.2 SPECIFICATIONS

None of the Unified Facilities Guide Specifications (UFGS) are required to be submitted at this design stage. However, any Contractor generated specifications required to meet the project specifics, or individual specification items added to the provided guide specifications shall be submitted for review. Note that UFGS sections 21 13 13.00 10, WET PIPE SPRINKLER SYSTEMS, FIRE PROTECTION, 21 13 17.00 10 DRY PIPE SPRINKLER SYSTEMS, FIRE PROTECTION, AND 28 31 76 INTERIOR FIRE ALARM AND MASS
NOTIFICATION SYSTEM CURRENT LOOP are required for this contract. UFGS sections may be edited only for those portions that do not apply to this project. For the items that do apply, no changes may be made.

1.11.3 DESIGN ANALYSIS

The design analysis shall include a separate fire protection report containing, but not limited to, review statements and/or comments on the following items, where applicable.

a. Location and rating of fire walls and fire partitions.
b. Column, floor, and roof protection.
c. Path of travel for emergency egress and operation of panic exits.
d. Access to building for fire fighting.
e. Design and placement of fire and smoke stop doors.
f. Labeled windows, where required.
g. Venting of smoke.
h. Placement of hand fire extinguisher cabinets.
i. Type and adequacy of sprinkler system.
j. Building exterior fire protection facilities and building clearances.
k. Type of occupancy.
l. Zoning of fixed fire protection systems and hydrant flow test results.
m. Type and adequacy of fire alarm and detection systems.
n. Zoning of fire alarm and detection systems.
o. Life Safety Plans and Building Code Analysis
p. Number of zones of alarm and detection systems that are separately transmitted to the base or installation fire department.

1.12 ENVIRONMENTAL PROTECTION COMPLIANCE

1.12.1 SPECIFICATIONS

If Section 01 57 20.00 10 ENVIRONMENTAL PROTECTION is not adequate for compliance with environmental laws and regulation for this project, the Contractor shall be responsible for developing additional requirements and/or editing the specification to ensure that the project is in full environmental compliance. If Section 01 57 20.00 10 ENVIRONMENTAL PROTECTION is revised by the Contractor, the revised specification shall be included with this submittal.

1.12.2 DESIGN ANALYSIS NARRATIVE

The Contractor shall prepare a chapter in the Design Analysis entitled:
"Environmental Protection Compliance". This chapter shall summarize how the project complies with environmental laws and regulations with regard to environmental permits, notices, reviews and/or approvals by the governing authorities. As a minimum, the chapter shall include the following:

a. The list of Permitting and/or Approving Authority(ies).

b. The list Construction/Operating Permits, Notices, Reviews and/or Approvals required for the project. If, when checking with the environmental agencies, a permit, notice, or approval is not required, include a copy of the telephone conversation memorandum or letter from the agency stating nothing required.

c. Time required by the permitting agency(ies) to process the application(s) and issue the permits.

d. Fee schedule including filing/application fees, review fees, emissions fees, certification testing, etc.

e. Monitoring and/or compliance testing requirements.

f. Copies of the completed application forms and associated documents.

1.12.3 Submittal of Environmental Approvals, Permits Applications and Associated Documents

Approvals and/or Permits, for which the facility is required to be permittee or the facility is required to submit for approval to the Federal, State, or local governing agency, may be required to be submitted with 60 percent design documents because of time restraints for obtaining the permit. The Contractor shall complete the technical portions of the approvals, permit applications and complete the required associated supporting material. This package shall be submitted to the Corps of Engineers with sufficient time for the Federal Facility to receive the approval and/or permit prior to construction commencing.

1.13 SAFETY

1.13.1 SPECIFICATIONS

At a minimum, identify the pertinent UFGS guide specification that will be edited.

```
01 35 26 Governmental Safety Requirements
02 82 13.00 10 ASBESTOS ABATEMENT
02 83 13.00 20 LEAD IN CONSTRUCTION
02 84 16 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY
```

Any interference with the Civil, Mechanical, Electrical, Geotechnical, and Environmental specifications shall be addressed and reviewed to extract the list of sampling and analysis requirements.
1.13.2 DESIGN ANALYSIS

1.13.2.1 Narrative

The Design Analysis Narrative shall list all conditions impacting safe work on the project for each of the sections listed above. Potentially hazardous conditions such as and materials shall be identified. The basis and reasons for specific decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. Design statements shall be provided in sufficient detail to enable the reviewer to get a clear picture and understanding of all included work. Narrative shall be complete relative to scope and intended design approaches. The total scope projected to final design shall be outlined in a form that will be conveniently adapted, expanded and detailed at the final design stage. The design analysis shall carry a complete narrative for every item covered in the design.

1.13.2.2 Design Analysis Calculations

Amount and location of hazardous material (asbestos, lead paint, PCBs, etc) that will be removed shall be addressed.

1.13.2.3 Basis, Specific goals, Objectives and Priorities for Hazardous Material

The Design Analysis should establish specific goals, objectives and priorities for safety (including the removal, handling and disposal of hazardous materials) of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Show how systematic planning has been used in the design, and to meet the objectives. Systematic planning ensures high decision confidence and stakeholder satisfaction. It should list various regulatory, scientific and engineering decisions that must be made in order to achieve the desired outcome, list unknowns that stand in the way of making those decisions, and strategies to eliminate or manage the unknowns.

1.14 SUSTAINABLE DESIGN

Provide a draft of the summary documentation of all items and categories in Leadership in Energy and Environmental Design (LEED) Green Building Rating System that have been incorporated into the design in order to achieve a Silver LEED rating. The LEED rating Project Checklist, shall be completed by the Contractor and submitted to the Government along with supporting documentation. See Section 01 81 00 SUMMARY OF WORK for additional requirements. The summary documentation shall be part of the design analysis and the LEED Checklist, Air Force HPSB Score Sheet, and Project Energy Summary shall be included as an Appendix to the Design Analysis.

PART 2 NOT USED

PART 3 NOT USED

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SECTION 01 33 00.38

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05/07

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PART 2 NOT USED

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For general submittal requirements, see Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.1 REFERENCES

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)


ACI INTERNATIONAL (ACI)


INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)


IEEE Std 242  (2001) Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems - Buff Book

AMERICAN WELDING SOCIETY (AWS)


NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70  (2017) National Electrical Code

U.S. DEPARTMENT OF DEFENSE (DOD)

AF ETL 11-18  Small Arms Range Design and Construction (19 April 2011)

AF FC 4-179-03F  Air Force Indoor Small Arms Firing Range (1 April 2015)

UFC 1-200-01  DoD Building Code (General Building Requirements) (20 June 2016)

UFC 3-600-01  Fire Protection Engineering for Facilities (8 August 2016)

UFC 4-021-01  Design and O&M: Mass Notification Systems (January 2010)

UFC 3-310-05A  (March 2005) Design: Masonry Structural Design for Buildings
1.2 CIVIL/SITE

1.2.1 DRAWINGS

1.2.1.1 Location Plan and Vicinity Map

A Vicinity Map consists of a small scale drawing of the project location, similar to a road map. A Location Plan consists of a small scale drawing showing the Government property or reservation limit with the construction project site shown. The drawing shall show the facility approved Contractor Access and Haul Routes. A reproducible base sheet, if available, may be provided by the Omaha District for the Contractor's use in preparing the Location Plan.

1.2.1.2 Survey Plan

The information depicting existing conditions used to generate site drawings shall be shown on this drawing. An engineering survey of the site will be presented to the Contractor selected as a result of this RFP process. Any additional survey information required by the Contractor for design above that shown in the prepared engineering survey shall be procured and paid for by the Contractor.

1.2.1.3 Removal Plan

The removal plan will show the existing physical features and condition of the site before construction. This information should include the field survey to show all above and below ground utilities; buildings, drives, roads and parking areas, walks, and vegetation; and such facilities as retaining walls, underground storage tanks, foundations, etc. Each physical feature to be removed shall be as indicated on the standard legend sheet, a legend on the removal plan, and properly noted: to be removed, to remain, or to be relocated.

1.2.1.4 Site Plan

The Site Plan shall show all the site layout information necessary to field locate the building, walks, parking lots, and all other appurtenances to be constructed on the project. All site related work to be constructed will be located by dimensions. The Site Plan will identify all site related items such as: curbs, pavements, walks, plazas, bollards, trash enclosures, retaining walls, etc. in accordance with a standard legend sheet or with additional legends or notes. Site Plans shall be at a scale of 1 Inch = 20 Feet or 1 Inch = 40 Feet. Other drawing scales must be approved by the Omaha District. North arrows shall be oriented the same direction on all plan sheets and by all disciplines. No existing or proposed contours shall be shown on this Plan. The Site Plan, prior to adding the dimensions, should serve as the base sheet to the other Plans, such as: Utilities Plan, Grading and Drainage Plans and Landscape Plan. The Site Plan shall show all existing physical features and utilities within and adjacent to the work site that will remain after the proposed construction has been completed. This plan will also show any free zones, construction limits, and storage areas. Whenever the Site Plan occupies more than one sheet of drawings, a Key Plan shall be included. Additional plans, showing specific areas of the site in smaller scales can be included.
1.2.1.5 Grading and Drainage Plan

A final grading and drainage plan shall be provided at the same scale as the site plan 1 Inch = 20 Feet or 1 Inch = 30 Feet. Other drawing scales must be approved by the Omaha District. In addition to the requirements for the preliminary plan, the final plan shall show the final location of all storm drains, culverts, and subdrains. Storm drainage lines and structures shall be labeled. The rim elevation of all manholes, curb inlets, and area inlets shall be indicated.

1.2.1.6 Composite Utilities Plan

A Composite Utilities Plan shall be provided at a scale of 1 Inch = 20 Feet or 1 Inch = 30 Feet. Other drawing scales must be approved by the Omaha District. New and existing utilities shall be indicated. Plans shall show layout of the new and existing storm drainage systems, gas systems, sanitary systems, electrical systems, communication systems, water systems, steam systems and any other utilities which need to be provided for. Include new and existing contours.

1.2.1.7 Storm Drain Profiles

Provide profiles of all new storm drains, subdrains, and culverts showing new and existing grades, new and existing utilities, pavement sections in detail, pipe diameters and lengths, pipe slopes, invert elevations, etc. Class and gauge of all storm drain, subdrain, and culvert pipes shall be provided. This information may also be included in Storm Drain and Subdrain Schedule drawings. Profiles of roof drain runout lines may or may not be provided, at the Contractor's discretion.

1.2.1.8 Drainage Structure Details

Provide typical details of all storm drainage structures. Unless otherwise directed, use Omaha District standard detail drawings. The use of alternate details shall be approved prior to the final design documents. A, B, C, and D dimensions of all storm drain and subdrain structures shall be shown. Dimensions may be shown on either the Storm Drain and Subdrain Schedules, profiles, or structure detail drawings.

1.2.1.9 Pavement Details

Provide details of concrete curb and gutter, integral curb, typical pavement sections, typical sidewalk section, pavement utility cut details, and interface detail between new and existing pavement. Concrete curb and gutter and integral curb shall conform to standard details provided, in RFP drawings.

1.2.1.10 Pavement Joint Layout Plans

Provide pavement joint layout plans with spot elevations at joint intersections for all new concrete roads, parking areas, and pavements. Each type of joint shall be shown with a different symbol and a joint legend provided. Pavement joint layout plans shall be drawn at a scale of
1 Inch = 10 Feet or 1 Inch = 20 Feet. Under no circumstances shall pavement joint layout plan be combined with any other plans.

1.2.1.11 Concrete Pavement Joint Details

Provide concrete pavement joint details. Use Omaha District standard detail drawings whenever practicable.

1.2.1.12 Fence Details

Provide details of fence and gates. Use Omaha District standard detail drawings whenever practicable.

1.2.1.13 SWPPP Site Map

Provide a site map indicating drainage patterns and approximate slopes anticipated after major grading activities, areas of soil disturbance, areas which will not be disturbed, locations of major structural and non-structural erosion controls identified in the Storm Water Pollution Prevention Plan, locations where stabilization practices are expected to occur, locations of off-site material, waste, borrow or equipment storage areas, surface waters (including wetlands), and locations where storm water discharges to a surface water.

1.2.1.14 Erosion Control Details

Provide details of best management practices used to control erosion.

1.2.1.15 Site Furnishing Details

The Contractor shall provide designs and details as necessary for site furnishings and accessories.

1.2.1.16 Landscape Plan

A Landscape Plan showing seeded and sodded areas, shall be prepared. The Landscape Plan shall be prepared by a fully qualified, experienced professional Landscape Architect. The A-E (Contractor's Designer) shall specify types of plant materials that are locally grown, commercially available and acclimated to the project environment. The Landscape Plan shall include a plant materials schedule or listing. This schedule shall include botanical names, common names, size, the method of planting and remarks. The Landscape Plan shall also show all unsurfaced ground areas disturbed by construction within the project limits with these areas shown to be seeded, sodded, or mulched as required.

1.2.1.17 Landscape Details

The Contractor shall verify the methods of planting to meet the project site/installation requirements and provide the necessary Landscape Details to perform the contract design work. Details shall reflect local practices and conditions for installation. The Contractor shall provide designs and details as necessary for other required site furnishings and accessories.

1.2.1.18 Sprinkler Irrigation System Plan

Sprinkler irrigation plan shall designate the lawn area to be irrigated. Plan shall show head layout piping with sizes and all other corresponding components. All appropriate details are to be shown and calculations
included. Provide flow and pressure requirements.

1.2.2 SPECIFICATIONS

Provide complete edited specifications for all items. Technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

1.2.3 DESIGN ANALYSIS NARRATIVE

Design analysis shall include the following:

1.2.3.1 References

Provide design references used in preparing the civil/site design.

1.2.3.2 Basis For Design

The Design Analysis should give the basis, specific goals, objectives and priorities for civil/site design of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Document stormwater pollution prevention measures and other environmental considerations made during design.

1.2.3.3 Grading

A narrative of the grading design and criteria used.

1.2.3.4 Drainage

A narrative of the drainage design and criteria used. Include information on the storm drain pipe materials selected and their ability to withstand earth dead loads and live loads that will be imposed.

1.2.4 Design Analysis Calculations

1.2.4.1 Storm Drainage System Calculations

Storm Drainage System Calculations shall include the following:

a. Drainage area map showing boundaries of each drainage area and respective drain inlet or culvert.

b. Storm run-off calculations for each drainage area.

c. Tabulation of capacities of new storm drains including: diameter and slope of storm drain pipes, design storm discharge and velocity for each storm drain pipe, maximum discharge capacity of each storm drain pipe, headwater depth of each culvert during design storm discharge.

d. Hydraulic capacity calculations for each new curb and area inlet.

1.2.4.2 Pavement Calculations

Pavement thickness calculations for each pavement.
1.2.4.3 Sprinkler Irrigation System Design Parameters

A list of applicable criteria and/or design standards shall be provided. This shall also include precipitation rates, pipe sizes and material and complete calculations of total flow and pressure requirements and head losses. A narrative description of the system including special requirements and drip systems shall be provided.

1.3 GEOTECHNICAL

See Structural Design Requirements.

1.4 WATER SUPPLY AND WASTEWATER

1.4.1 DRAWINGS

Generally, the corrected and approved 60 percent plans may be used as the basis for the final plans. However, all details necessary for complete construction must be included. The 100 percent final design submittal shall include all the information presented in the 60 percent submittal, updated to final design status, corrected to reflect any changes made in response to review comments, and shall include the additional requirements specified hereinafter. Any concerns in developing the final design documents shall be resolved prior to starting the final design stage.

1.4.1.1 Water Distribution and Sewage Collection Systems Plans (including building services)

Provide all existing utilities and above ground features, including sizes and material types, which may pose as an obstacle (i.e., water, sewer, gas, electrical, etc.) on the basic site plan layout. Indicate existing pipe material and sizes where new lines connect along with the type of connection and elevations of connections. Provide all new water and sewer lines with sizes. This will include all new service lines, up to within the 5-foot building line. Locations of all new manholes, fire hydrants, valves (including PIV's), similar appurtenances, connection points and etc. shall be provided. For pavement cuts, show type of pavement to be removed and replaced. Show contours on plan view. Include stationing on both plan and profile sheets.

1.4.1.2 Water Distribution and Sewage Collection Systems Profiles

Profiles of all gravity sewers, waterlines (excluding service connections) and sewage force mains shall be provided. Profiles may be omitted for short waterlines, unless necessary to assure adequate cover or avoid interference with other underground facilities. Indicate existing pipe material and sizes where new lines connect. Indicate type of connection and elevation. Include all interference elevations.

1.4.1.3 Water Distribution and Sewage Collection Systems Details

Appropriate water and sewer details shall be provided. Use Omaha District standard detail drawings. The standard detail sheets will be furnished if required. For roadway pavement crossings, indicate installation method (open cut, boring, jacking, etc.). Include standard casing details.
1.4.2 SPECIFICATIONS

Specifications shall be coordinated with the plans and include all items. Provide special sections to cover those subjects for which no UFGS guide specifications are used or available. These special sections shall include all approved changes from the 60 percent review stage. All UFGS guide specifications, to be provided, shall be in edited form showing all text to be deleted and added.

1.4.3 DESIGN ANALYSIS NARRATIVE

Design analysis shall include the following and all applicable data contained in the 60 percent design analysis narrative shall be repeated. References shall not be made to the previous design analysis. The final design analysis shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design.

1.4.3.1 References

Provide design references used in preparing the water and wastewater design.

1.4.3.2 Water Supply and Distribution Systems

A narrative of the water supply and distribution systems design and applicable criteria used shall be provided. Include the peak and average domestic demands, the interior and exterior fire flow requirements and the available flow and residual pressures. A description of the water distribution system, and complete calculations necessary to support equipment, piping sizes, interior and exterior fire demands, and domestic demands, etc. shall be provided.

1.4.3.3 Wastewater and Sewers

A narrative of the wastewater supply design and applicable criteria used shall be provided. Include the average, diurnal peak, and extreme peak flows along with the full flow capacity (70% of the total depth) of the system. The design shall be in accordance with velocity requirements of UFC 3-240-07FA. A listing of allowable piping materials, and complete calculations necessary to support equipment and piping sizes shall be provided.

1.5 ARCHITECTURAL

1.5.1 DRAWINGS

The drawings shall be complete, include all necessary and required details, thoroughly checked, and fully coordinated with the technical Specifications and all other Construction Documents. Previous comments and applicable criteria changes shall have been incorporated into the design. Removal work and details should be shown on separate drawings. The contract drawings shall fully describe the type and the scope of work required. The layout of individual sheets and the organization of the assembled set shall follow and communicate a logical sequence. General information shall be presented first, progressing to more detailed information. When assembling details, begin in the upper left-hand corner of the sheet with letters progressing to the right and down. When dimensioning, use arrowheads, not dots or slashes. Where major structural elements are included as parts of architectural detailing, do not indicate sizes. These elements must be
fully defined in the structural design documents. See 60% Architectural drawing submittal requirements for drawing scales of remaining drawings to be submitted. Contractor shall submit letter by Fire Protection Engineer at 100% submission certifying the design complies with all pertinent codes, UFCs, etc. Contractor shall submit life safety and building code plans stamped by the fire protection engineer at the 100% design. Include all drawings from the 60% submittal plus all additional detail drawings required for complete 100% design. These shall include but not be limited to the following:

- Interior Elevations and Details
- Door Details
- Window Details
- Louver Details
- Roof Details
- Stair Details
- Casework Plans, Elevations, and Details
- Wall Plan Details and Plan Details
- Fire Wall Details and Penetration Conditions
- Sealant Details
- Ceramic Tile Details
- Ceiling Details
- Control/Expansion Joint Details
- All Miscellaneous Details

1.5.2 SPECIFICATIONS

The technical specifications shall be complete and fully coordinated with the drawings. Special sections shall be prepared to cover those subjects for which no pattern guide specification is available. Notes to the Designer that accompany specifications shall be used in editing technical guide specifications. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All UFGS guide specifications shall be edited in accordance with Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.5.3 DESIGN ANALYSIS NARRATIVE

The Design Analysis shall include the basic information presented in the previous submittal, corrected to reflect changes in content made in response to review comments. Outline specifications shall be omitted from the Final Design Analysis as the information is included on the final drawings and project specifications. The design analysis shall be written in the present tense.

1.5.4 DESIGN ANALYSIS CALCULATIONS

The Design Analysis calculations shall include the basic information presented in the previous submittal, corrected to reflect changes in content made in response to review comments.

1.6 INTERIORS

1.6.1 DESIGN ANALYSIS NARRATIVE

Updates as a result of the 60% review conference shall be made to the design analysis.
1.6.2 DRAWINGS

Updates required to the furniture footprint as a result of 60% review shall be incorporated into the drawings.

1.6.3 SPECIFICATIONS

Technical specifications shall be in final form for construction (in accordance with the requirements of Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES and shall include all changes requested during the 60% review stage. All specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product, installation requirements, and testing methods for this facility.

1.6.4 COLOR BOARDS AND LEGENDS

Color boards shall show actual color samples of all proposed exterior and interior finishes. A color board legend shall accompany the boards and shall clearly identify all finishes. Clarification of finish placement shall be required when more than one color of a single finish is proposed. Color boards shall be 8 1/2" x 11" in size and be provided in a three ring binder. Include project name and location, design stage and date on the front cover and spine of the binder.

1.6.5 FURNITURE, FIXTURES AND EQUIPMENT (FF&E)

Per UFC 3-120-10 INTERIOR DESIGN submittal requirements, provide a 100% design. Updates required to the FF&E as a result of 60% review shall be incorporated. Include an Item Code Legend, not an Item Installation List.

1.7 STRUCTURAL

1.7.1 DRAWINGS

Final drawings shall be complete, thoroughly checked, and fully coordinated with the other disciplines, specifications and all other construction documents. Previous comments and applicable criteria changes shall have been incorporated into the design. The drawings shall be complete with all plan views, elevations, sections, details, schedules, diagrams, and notes necessary for the construction of the project. For structural steel framing, the drawings shall meet the requirements for design drawings set forth in the AISC 350 AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings. All structural steel members and connections shall be fully detailed. Design of structural steel connections shall be the responsibility of the structural design engineer and shall not be delegated to the steel fabricator. For structural concrete, the drawings shall conform to the standards for engineering (design) drawings set forth in the ACI Detailing Manual ACI SP-66. Additionally, those items described below which are applicable to the design shall be incorporated into the drawings. Drawings shall be at a scale appropriate for the design, in no case however, shall plan type drawings be done at a scale smaller than 1/8" = 1'-0" or detail type drawings at scale smaller than 1/2" = 1'-0".

1.7.1.1 Grid Systems, Dimensions, and Floor Elevations

Each foundation and slab plan, floor framing plan and roof framing plan shall have an alpha-numeric grid system aligned with centerlines of any
columns or pilasters, or with load bearing and non-load bearing walls, as applicable. The same grid system shall be used for all plan views. Each plan view shall have all necessary dimensions. On plan views, the dimensions shall define the location of grid lines, offsets, and all structural elements, as well as the overall sizes of the buildings and structure. The finish elevation of the floor shall be indicated as 100'-0", and elevations for all other roofs, floors, and foundations shall be numerically referenced to this basic elevation.

1.7.1.2 Plan Sheets

a. Foundation and Slab Plans

Foundation and slab plans shall show the size and location of all foundation elements, such as foundation walls, grade beams, piers, footings, piles, and pile caps, drilled piers, and foundation drains. Elevations for footings, pile caps, and foundation drains shall be indicated on the plan. Plans for building slabs-on-grade and exterior stoop slabs at building entrances shall show location and type of joints, slab thicknesses and reinforcing, elevation of slab surfaces, and any other design features, such as drain trenches or equipment bases, which affect the slab design. Also, indicate if slabs are placed over a vapor barrier and capillary water barrier.

b. Framing Plans

Separate framing plans shall be provided for each structural floor roof and all parts of the structure. Plans shall show the size, spacing, and location of all roof and floor framing members, their supporting columns, pilasters or walls, all auxiliary members such as bracing and bridging, sag rods and the size and location of all major openings through floors and the roof.

1.7.1.3 Elevation Views, Sections and Details Sheets

Elevation views, sections and details necessary to illustrate fully the design shall be provided. Some requirements peculiar to the various structural materials are described below.

a. Concrete

Drawings shall include elevation views as necessary, plus sections and details to show the outlines of concrete cross-sections, reinforcing bar arrangements, concrete cover for rebar, installation of embedded items, and joint construction. All lap splice and embedment lengths for reinforcing bars shall be clearly indicated on the drawings. A sill detail for each foundation condition at exterior and interior doors shall be provided.

b. Precast Concrete

Submit drawings and design calculations indicating complete information for the fabrication, handling, and erection of the precast prestressed member. Drawings shall not be reproductions of contract drawings. Design calculations and drawings for precast prestressed concrete units (including connections) shall be made by a registered professional engineer experienced in the design of precast prestressed concrete members and registered in the state where the project is located, and submitted for approval prior to fabrication. The drawings shall indicate, as a minimum, the following information:
i. Plans, elevations and other drawing views showing the following:
   (1) Member piece marks locating and defining products furnished by
       the manufacturer.
   (2) Headers for openings.
   (3) Location and size of openings that cut prestressing strands or
       require the location of prestressing strands to miss field cut
       openings.
   (4) Relationships to adjacent material.
   (5) Joints and openings between members and between members and other
       construction.
   (6) Location of field installed anchors.
   (7) Erection sequences and handling requirements
   (8) Areas receiving toppings and magnitude of topping thickness.
       Identify areas where topping is an integral part of the structural
       capacity of the precast prestressed members.
   (9) Lifting and erection inserts

ii. Elevations, sections and other details for each member showing the
    following:
   (1) Connections between members and connections between members and
       other construction.
   (2) Connections for work of other trades and cast-in items and their
       relation to other trades.
   (3) Dimensioned size and shape for each member with quantities,
       position and other details of reinforcing steel, anchors, inserts
       and other embedded items.
   (4) Lifting, erection and other handling devices and inserts.
   (5) Surface finishes, texture, treatment, and color of each member.
   (6) Estimated cambers

iii. Magnitude, schedule and sequence of tensioning and detensioning
     prestressing strands.

iv. Strength properties for concrete, steel and other materials.

v. Methods for storage and transportation.

vi. Description of loose, cast-in and field hardware.

vii. All dead, live, handling, erection and other applicable loads used in
    the design.

viii. Reinforcing, including prestressing and special reinforcement
      details. Panel thicknesses showing and dimensioning the various concrete
      wythes and insulation layer(s).

ix. Minimum concrete compressive strengths at initial prestress and 28
    days, initial prestress to be applied, and minimum release strength.

x. Shoring, unless structural computations are submitted showing that
    allowable concrete stresses during the work will not be exceeded when
    shoring is not used.

xi. Indicate separate face and backup mix locations.

c. Masonry

Wall reinforcing shall be located and identified on plans, in section cuts,
elevation views or in schedules. Structural elevations when needed shall be included to clarify the construction requirements for masonry reinforcement, especially the reinforcement around wall openings. Details applicable to the project shall be shown on the structural drawings. Listed below are some frequently required masonry details, most of which are shown in UFC 3-310-05A, and on the Typical Masonry Sheets. The Typical Masonry Sheets will be provided to the successful offeror upon request and may be edited and incorporated into the final drawings as needed. Additional details as required shall be extracted from other sources and incorporated into the final drawings. All details shall be fully edited to reflect the specific requirements of this project. Supplemental details shall be added as necessary to complete the design.

Masonry Details Frequently Used
- Masonry Control Joint (MCJ).
- Brick Expansion Joint (BEJ)
- Control Joint at Bond Beam.
- Bond Beam Corner Reinforcement.
- Seismic Reinforcement Around Wall Openings.
- Wall Reinforcement Details for 1 and/or 2 bar-per-cell stiffeners.
- Doweled or Other Connection of Masonry to Foundation, Floor, Roof or Bond Beam.
- Bond Beam (or Steel) Lintels and Bearing Details
- Lateral Support Detail for Top of Masonry Partition Walls.
  (lateral support locations must be shown on framing plan sheets.)
- Steel Joist Bearing

d. Structural Steel, Steel Joists, and Steel Decking

Structural steel connections shall be fully detailed and shown on the drawings. The anchorage of beams, trusses, joists, and steel deck to walls or other bearings, and the extra framing or reinforcement required at deck openings shall also be detailed. Notes, details, or schedules on the drawings shall indicate the steel deck attachment method to be used, and shall give the size and spacing for perimeter, side lap, intermediate supports and end lap attachments. Welded connections shall be detailed using standard weld symbols illustrated in AWS D1.1/D1.1M. All applicable weld sizes, spacing, types, contours and finishes shall be shown.

1.7.1.4 Schedules

a. Foundation Schedules

Foundation schedules for the foundation type selected shall be included, as applicable. The schedule shall include all pertinent information required for the foundation system being used.

b. Framing Schedules

For concrete framing, beam and column schedules shall conform to the requirements of the ACI SP-66. For structural steel framing, provide a column schedule complete with design loads at splices, if any, and at column bases.

1.7.1.5 Equipment Loads

All equipment loads which exceed 200 lbs and are not supported by concrete slab-on-grade shall be identified on the drawings by showing equipment
locations, total weights, and reaction loads at support points.

1.7.1.6 Notes

a. Design Notes

Under the heading "Designer's Notes," the structural drawings shall contain notes which begin: "The structural design was prepared using the following data:". The data then listed shall include the structural loading criteria used for design, such as roof and floor live loads, snow load design parameters, wind speed and wind load design parameters, seismic design parameters vehicular loads, allowable soil bearing pressures (as recommended by the Final Foundation Analysis report, foundation design depth, design wind uplift pressures for steel joists and other data pertinent to future alterations. Also, to be listed are the ASTM designations and stress grades of the applicable structural materials: structural steel, masonry, cold-formed metal framing, concrete for each usage, reinforcing bars, welds, and bolts.

b. General Notes

Other notes, which direct the work to be performed, the materials to be used, etc., shall be grouped under the heading of "General Notes." Included in these notes should be a description of the building's structural system, if necessary.

1.7.2 SPECIFICATIONS

Technical specifications for final design shall be prepared in accordance with the instructions provided in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES, Paragraph 3.2 "Specifications". The technical specifications shall be complete and fully coordinated with the drawings. All specification indexes shall be completely edited to reflect the paragraphs retained in the body of the specification. All references that have not been used in the body of the specification shall be edited from the technical specification.

1.7.3 DESIGN ANALYSIS NARRATIVE

The final design analysis narrative shall repeat and expand upon the basic information presented in the 60% design analysis narrative, and shall be corrected to reflect revisions made for the final design.

1.7.4 DESIGN ANALYSIS CALCULATIONS

Calculations shall be prepared by an experienced structural engineer and shall include an investigation of loading, (gravity, wind, seismic, etc.) shear, moment, wind uplift, stability and deflection calculations. The computations are to be systematic and accurate. Similar beams, columns, panels, or connections may be grouped by designing the largest member or connection in the group, but every individual slab, beam, column, footing, connection or other structural member or structural consideration indicated by the plans shall be accounted for by pertinent calculations, statement or reasoning, or reference to a design source. Design formulas shall be written out in symbols the first time each is used, before the numerical values are supplied. All formulas and results (answers) shall be identified by dimensional units. Basic assumptions of loads, working stresses, and methods of analysis must appear in the calculations; these assumptions must be applied consistently to a given problem. Complete design calculations
shall be required for all original designs. The calculations shall be presented in a clear and legible form, incorporating a title page, table of contents, and a tabulation showing all design loads and conditions. Pages shall be numbered consecutively and identified in the table of contents. Cross referencing shall be clear. The source of loading conditions, formulas, and references will be identified. Assumptions and conclusions shall be explained. Superseded areas of computations must be ruled out. All computations shall be given a complete numerical and theoretical check within the Contractor's office. Calculation sheets shall carry the names or initials of the developer and the checker, and the dates of calculations and checking. No portion of the design calculations shall be developed and checked by the same individual.

1.7.4.1 Computer Calculation Submittals

All applicable input and output data shall be included in readable printed form as part of the design calculations. Continuous paper such as that used in computer terminals or printers shall be cut into individual pages and shall not be submitted in a continuous roll form. All input and output data shall include a brief synopsis of the computer program(s) stating required input, method of solution, approximations used, codes and specifications used, output generated, extent of previous usage or certification of the program(s), and program author(s). Generalized flow chart(s) may be used to supplement description of solution process, if desired. All computer generated and long-hand calculation sheets shall be identified by sheet number, indexing and cross-referencing. Each member or structure being analyzed shall be identified, dimensioned and shown in a loading diagram. A separate diagram shall be provided for each load case, such as dead plus live, dead plus wind, etc. Input and output values including intermediate values shall clearly be identified if such values are necessary for evaluation of the submittal.

1.7.5 Final Geotechnical Investigation Report

The geotechnical investigation data, which will be included in this RFP at a later submittal, is intended for proposal preparation and final design use. The information in the Final Subsurface Investigation and Geotechnical Information Report included in the RFP represents the best available site data. Variations from the typical conditions described may exist at the site.

1.8 MECHANICAL

The 100 percent final design submittal shall include all the information presented in the 60 percent submittal, updated to final design status, corrected to reflect any changes made in response to review comments, and shall include the additional requirements specified hereinafter. Any concerns in developing the final design documents shall be resolved prior to starting the final design stage.

1.8.1 DRAWINGS

The final design drawings shall be fully coordinated with the design analysis and specifications. Provide sufficient plans, piping diagrams and isometrics, mechanical room sections, water and air flow diagrams, details, schedules, control diagrams, sequences of operation, etc., as necessary to define the design requirements. Large-scale plans of congested areas shall be provided. Coordinate with architectural design for provision of access panels for all concealed valves, traps and air vents, etc. Floor plans
shall use the architectural floor plans as a basis, with the building outline half-toned. The final design drawings shall include all the requirements and drawings defined for the 60 percent submittal. In addition, the following new drawing requirements and drawings shall be provided:

1.8.1.1 Mechanical Abbreviation, Legend, and General Notes Sheet

On this sheet, include any mechanical general installation notes that may be required to clarify the construction intent that may not be readily apparent in the specifications or on the drawings. General notes may be provided on a separate sheet if space does not exist on the Abbreviation and Legend sheet.

1.8.1.2 Plumbing Drawings

Enlarged Toilet Room Plans:

Enlarged toilet room plans showing all fixtures, water, waste, and vent piping shall be provided for each toilet area. Enlarged plans shall be drawn at a minimum $1/4" = 1'-0"$ scale.

1.8.1.3 Mechanical HVAC Drawings

Hot Water System Flow Diagram:

Provide a hot water flow diagram showing the boiler, pumps, and all connected heating equipment including radiant floor heating system. Each equipment item shall show associated flowrate. All thermometers, pressure gauges, isolation and control valves, bypass piping, etc. shall be shown on the flow diagram.

Chilled Water System Flow Diagram:

Provide a chilled water flow diagram showing the cooler, pumps, and all connected cooling equipment. Each equipment item shall show associated flowrate. All thermometers, pressure gauges, isolation and control valves, bypass piping, etc. shall be shown on the flow diagram.

1.8.1.4 HVAC Control Drawings

In addition to the updated Controls Legend and System Block Diagram Sheets, final HVAC control drawings for each system and item of equipment shall be in accordance with the following requirements:

Control Diagrams:

Control Diagrams shall be provided for each system or item of equipment. Systems diagrams shall include every major component installed in or connected to the system, and only one system shall be shown on each diagram. Control Diagrams shall schematically show all sensors, controllers, actuators, indicators, and operator interface devices that are required for the complete automatic control and monitoring of the system. All sensing devices utilized in the control or instrumentation of the system, and all actuating devices shall be shown in their correct mechanical location and functionally interconnected to the other control devices which comprise the control loop. All controlling devices shall be shown with all functional interconnections to inputs and outputs. Each sensing, controlling, actuating, and indicating device shall have its own
unique control loop tag identifier. Communication linkages required to complete the entire intended interface between operators and the control system shall be shown schematically. This includes interconnections between local temperature control panels and the base EMCS. All associated thermometers and pressure gauges, located in their correct mechanical locations, shall also be shown on the diagrams. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

Sequence of Operations:

Sequence of Operations shall be provided for each item of equipment or system and shall fully describe the intended operation of the equipment or system in all different operating modes. As identified on the furnished Example Control Drawings, each Sequence shall be broken down by individual control loops and shall include descriptions of both normal operating modes (running, shutdown, standby, etc.) and abnormal, emergency or safety related modes. Sequences shall include a description of all indication instrumentation, alarm conditions, and automatic actions to be taken upon occurrence of alarm conditions. Each device referenced in the sequence shall be referred to by its unique tag identifier, with each component designator shown in parenthesis. Design setpoints shall be specified for each control loop and indicated as being adjustable. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

The designer shall analyze every component of each system and write each Sequence of Operation to compliment the Functional Performance Checklists. The Sequence of Control on the project drawings shall be explicit and written to ensure that all the requirements of the "Functional Performance Test Checklists" can be accomplished.

Control Points Lists:

Control points lists, identifying each temperature control system input and output, shall be developed for each temperature control panel. See furnished Example HVAC Control Drawings for the required level of detail and formatting.

1.8.2 SPECIFICATIONS

The submitted 60 percent technical guide specifications shall be updated, completely edited, and fully coordinated with the drawings to accurately and clearly identify the final product and installation requirements for the facility.

1.8.3 DESIGN ANALYSIS NARRATIVE

The Final Design Analysis Narrative shall include the information presented in the 60 percent submittal, shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design.

1.8.4 DESIGN ANALYSIS CALCULATIONS

The Final Design Analysis calculations shall include all the information presented in the 60 percent submittal, shall be corrected to reflect changes in content made in response to review comments, and shall be expanded to reflect the completed design. In addition, the following new calculations shall be provided:
a. Pipe sizing calculations for the chilled & heating hot water, plumbing, gas piping systems.

b. Chilled & heating hot water pump head calculations.

c. Chilled & heating hot water expansion tank sizing.

d. External static pressure calculations for all fans.

e. Control Valve CV calculations.

1.9 ELECTRICAL

1.9.1 DRAWINGS

Drawing scale shall match architectural drawing requirements.

1.9.1.1 Interior Drawings

Drawings shall be complete and accurate in every detail and shall include arrangements and types of light fixtures, receptacles, switching, location of special features, necessary details, including legends, fixture schedule, panel schedules, one-line diagrams, layout or functional diagrams for each of the various systems, riser diagrams if applicable, estimated maximum demand for each panel and for entire building and any other relative information which will help clear up any and all questionable items on the plans or in the specifications toward the development of a set of plans which will be clear, concise and correct. Additional drawing requirements for specific equipment or systems have been included in subsequent paragraphs pertaining to the equipment or systems.

1.9.1.2 Floor Plans

All rooms must be identified by name and number. Plans must be legible. Plans shall be developed using the same scale and areas as the architectural floor plans. Separate floor plans must be provided for lighting, power, and fire detection.

1.9.1.3 Diagrams

The power one-line diagram shall be on a dedicated sheet. The diagram should show ratings of major equipment including short circuit ratings. Power, communications diagrams, fire detection and telephone diagrams should be on separate sheets also.

1.9.1.4 Schedules

Provide panelboard and lighting fixture schedules. Panelboard schedules shall include the designation, location, mounting (flush or surface), number of phases and wires, voltage, ampacity and total connected and demand load. Indicate the trip rating, frame size, interrupting rating and number of poles for each circuit breaker in the panelboards. List the circuit number, circuit description and load for each branch circuit.

1.9.1.5 Exterior Drawings

Drawings shall be complete and accurate in all details and shall include the routing of all feeder and branch circuits.
1.9.2 SPECIFICATIONS

All specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product, installation requirements, and testing methods for this facility.

1.9.3 DESIGN ANALYSIS NARRATIVE

The text of the preliminary design analysis should be expanded to reflect the completed design. Calculations used to develop the design should be included. The document in its final form should conform in all applicable respects to the requirements of Section 01 86 26 ELECTRICAL DESIGN REQUIREMENTS.

1.9.4 DESIGN ANALYSIS CALCULATIONS

Backup data shall be furnished to support basic design decisions related to sizing of major equipment and materials, selection of economic alternatives, performance of specific systems or equipment. Calculations may be performed by manual or computerized procedures. Use of standardized charts, curves, tables, graphs will generally be acceptable for portions of required calculations or in lieu of specific calculation procedures. Such data must be from a recognized source which is identified in the design analysis. If possible, a copy of applicable sheets or pages should be included with the calculations. For given equipment, the calculations must conform to requirements identified under subsequent paragraphs herein pertaining to the equipment.

1.9.4.1 Service

Sizing of building service.

1.9.4.2 Transformers

Sizing of all transformers. (Generally for dry type transformers, 1 or 2 samples of detailed calculations to identify the method are sufficient, if input data for remaining units can be derived from panel or feeder sizing data.)

1.9.4.3 Feeders

Sizing of feeders (One detailed sample calculation is sufficient to establish the procedure, remaining data can be in schedules, tables, etc.).

1.9.4.4 Panelboards

Sizing and loading of panelboards and distribution equipment.

1.9.4.5 Voltage drop determination

Provide voltage drop calculations in accordance with IEEE Std 241 to demonstrate that the voltage drop requirements of NFPA 70 are satisfied.

1.9.4.6 Illumination calculations

Data should identify target and calculated illumination levels for all rooms and areas. Calculations should be adjusted to compensate for special applications -- irregularly shaped rooms, open sides, ceiling obstructions (beams, ductwork), corridors, etc. If the lumen method is used for
corridor calculations, the calculations should be performed using a module in which the length doesn't exceed 3 times the width (2:1 ratio preferred).

1.9.4.7 Short Circuit Evaluation

Calculate the fault current in accordance with IEEE Std 242 for each node in the electrical distribution system.

1.9.4.8 Protective Coordination Analysis

A protective coordination study shall be performed to show that the power system is selectively coordinated and is fully coordinated with the upstream breakers. In addition the study shall include all existing and new devices in the Base power plant affected by the installation of the Space Test and Evaluation Facility. The protective coordination / short circuit study shall be complete and approved by the government before any changes are made to the existing equipment.

1.9.4.9 Specialized Applications

Additional engineering backup should be included to address special requirements such as accommodation of nonlinear loads, harmonics analysis, energy studies, etc.

1.10 COMMUNICATIONS

1.10.1 Drawings

Drawing scale shall match architectural drawing requirements. Drawings shall be complete and accurate in every detail; be coordinated with all other work, sufficiently cross referenced to other drawings and specifications; include appropriate notes, schedules, diagrams and details; shall be organized and demonstrate that the work complies with all requirements of the RFP as follows:

1.10.1.1 Outside Plant Distribution

Drawings shall include manhole and ductbank system layout shall show all exterior features including: quantity and sizes of ducts, manhole types, cable types and routing, detail cross references and other notes.

1.10.1.2 Voice and Data Plans

Complete layout of all areas and outlets shall be provided. The type of outlets shall be indicated. Indicate areas served by TR's and equipment rooms. Cable tray, conduits and other pathways shall be shown, with sizes indicated. Racks, cabinets, and other equipment shall be shown and identified.

1.10.1.3 Riser Diagrams

Provide riser diagrams that indicate the ER and TR's; risers, backbone trays and conduits; backbone termination areas; racks and cabinets; service entrance configurations, typical horizontal cabling; and all backbone cabling (including types and counts). Provide separate diagrams for each system. Identify interfaces to other systems (fire alarm, EMCS, etc.)
1.10.1.4 Outlet Configurations

Show all unique outlet configurations, including connector types and quantities and labeling conventions.

1.10.1.5 Rack, Cabinet, and Equipment Elevations

Show individual elevations of each type of rack, cabinet, or other equipment or termination enclosures, including cable management, grounding, power, patch panels, connectors, etc.

1.10.1.6 Enlarged Room Plans

Provide enlarged room plans drawn at \( \frac{\frac{1}{4}''}{1'} \) of every room containing one or more racks or cabinets. Include scaled outlines of racks, backboards, cabinets, cable.

1.10.1.7 Details

Provide installation details that fully define installation requirements for typical and special conditions, including all termination enclosures, break-out boxes, consolidation point or box which includes termination or cable management hardware. Provide manhole details and elevations. Provide duct bank configuration and construction details.

1.10.1.8 PDS Drawings

Provide a separate set of drawings for each PDS. Provide plan drawings that include conduit routing, boxes and enclosures. All materials used in the PDS shall be identified and defined, including conduit type, conduit fittings, boxes, enclosures, locking mechanisms and alarm devices.

1.10.1.9 Miscellaneous Communications Systems

1.10.1.10 Plans

Show all devices and equipment for Public Address, and CATV.

1.10.1.11 Riser Diagrams

Provide a separate riser diagram for each system, showing all major components, typical minor components (speakers, volume controls, etc.) and interconnecting cabling.

1.10.1.12 Details

Provide installation details that fully define installation requirements for typical and special conditions.

1.10.2 Specifications

Submit prescriptive specification sections to specify the quality, characteristics, installation procedures and testing requirements for all items of the proposed communications design.
1.10.3 Design Analysis Narrative

The design analysis shall contain a description and analysis of the communications portions of the design. Special features, unusual requirements should be noted. Narrative must address all technical requirements identified in section 01 86 29 COMMUNICATIONS.

1.10.4 Design Analysis Calculations

Backup data shall be furnished to support basic design decisions related to sizing of cable trays and conduits.

1.11 FIRE PROTECTION

1.11.1 DRAWINGS

Design will be an extension of the 60% submittal, incorporating all comments thereto and any revised criteria, all as specifically directed by the District Office. All conflicts, lack of specific criteria, and/or direction, inconsistencies, ambiguities, and lack of thorough understanding of the nature and scope of work shall be resolved prior to starting final design work. The fire protection plans shall show the following: entire sprinkler system; fire detection and mass notification system, to include control panels, remote annunciators, alarm notification devices, and each initiating device; fire walls; fire partitions; building separations; other fire protection features. Submit letter by Fire Protection Engineer of Record certifying that the project meets all applicable codes, UFC, etc. at 100% submission. Submit life safety and building code plans stamped by the Fire Protection Engineer of Record at 100% submission.

1.11.2 TECHNICAL GUIDE SPECIFICATIONS

The following UFGS guide specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the product and installation requirements for the facility:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 13 13.00 10</td>
<td>Wet-Pipe Sprinkler Systems, Fire Protection</td>
</tr>
<tr>
<td>21 13 17.00 10</td>
<td>Dry-Pipe Sprinkler Systems, Fire Protection</td>
</tr>
<tr>
<td>28 31 76</td>
<td>Interior Fire Alarm ans Mass Notification System Current Loop</td>
</tr>
</tbody>
</table>

All items identified in the specifications not required shall be marked for deletion in accordance with the requirements of Section 01 33 00. 32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES. Those items of equipment, materials, or installation requirements that are required are not permitted to be modified or changed from that presently shown. Government approval is required for the final submittal of these guide specifications.

1.11.3 DESIGN ANALYSIS

The final design analysis will be an extension of the 60% design analysis and shall be complete for every item covered in the design and will include, but not be limited to, the following:

a. List of design criteria.

b. Design conditions.

c. Design calculations.
d. Complete description of system alarm zones.

e. Complete description of system sprinkler system.

f. Complete description of the building fire protection features.

g. Other pertinent information of value for future use in construction contract administration, substantiation of design methods, or permanent record shall be included.

1.12 ENVIRONMENTAL PROTECTION COMPLIANCE

1.12.1 SPECIFICATIONS

The Contractor shall be responsible for updating/revising UFGS Specification Section 01 57 20.00 10 ENVIRONMENT PROTECTION which is furnished with Division 1 of this RFP. Any additional environmental compliances that may be required for this project shall be included. This section shall be included with the 100% Design Specifications rather it has any revisions or not. See 60% submittal requirements for additional information.

1.12.2 DESIGN ANALYSIS

The Contractor shall update/revise the chapter in the 60% Design Analysis entitled: "Environmental Protection Compliance".

1.12.3 SUBMITTAL OF ENVIRONMENTAL APPROVALS, PERMIT APPLICATION AND ASSOCIATED DOCUMENTS

Any revisions that may be required to the permits and/or approvals which were submitted with the 60 percent submittals shall be submitted with final design submittals. If these submittals were not required to be submitted to the governing agencies for a permit or approval at 60% design, they shall be submitted with the 100% Design documents. Any additional approvals and/or Permits required, which were not previously submitted, shall be submitted to the Corps of Engineers with sufficient time for the permits to be obtained prior to construction commencing or with the final design submittals.

1.13 SAFETY

1.13.1 SPECIFICATIONS

At a minimum, the pertinent UFGS guide specification shall be completely edited and coordinated with the drawings.

01 35 26 Governmental Safety Requirements
02 82 13.00 10 ASBESTOS ABATEMENT
02 83 13.00 20 LEAD IN CONSTRUCTION
02 84 16 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY

Any interference with the Civil, Mechanical, Electrical, Geotechnical, and Environmental specifications shall be addressed and reviewed to extract the
list of sampling and analysis requirements.

1.13.2 Design Analysis

1.13.2.1 Narrative

The Design Analysis Narrative shall list all conditions impacting safe work on the project for each of the sections listed above. Potentially hazardous conditions such as and materials shall be identified. The basis and reasons for specific decisions, special features, unusual requirements, etc., shall be explained or summarized as applicable. If it is necessary to deviate from criteria or standard practice, reasons shall also be included. Design statements shall be provided in sufficient detail to enable the reviewer to get a clear picture and understanding of all included work. Narrative shall be complete relative to scope and design approaches. The design analysis shall carry a complete narrative for every item covered in the design.

1.13.2.2 Design Analysis Calculations

Amount and location of hazardous material (asbestos, lead paint, PCBs, etc) that will be removed shall be addressed.

1.13.2.3 Basis, Specific goals, Objectives and Priorities for Hazardous Material

The Design Analysis should establish specific goals, objectives and priorities for safety (including the removal, handling and disposal of hazardous materials) of the project. Identify, explain and document use of design criteria and how the design meets goals, objectives and priorities. Identify the preferred site development concept. Show how systematic planning has been used in the design, and to meet the objectives. Systematic planning ensures high decision confidence and stakeholder satisfaction. It should list various regulatory, scientific and engineering decisions that must be made in order to achieve the desired outcome, list unknowns that stand in the way of making those decisions, and strategies to eliminate or manage the unknowns.

1.14 SUSTAINABLE DESIGN

Provide a complete copy of the summary documentation of all items and categories in Leadership in Energy and Environmental Design (LEED) Green Building Rating System that have been incorporated into the design in order to achieve a certifiable LEED rating. The LEED rating Project Checklist, shall be completed by the Contractor and submitted to the Government along with supporting documentation. This submittal reflects revisions made between the 60 percent and 100 percent design submittals. See Section 01 81 00 SUMMARY OF WORK for additional requirements. The summary documentation shall be part of the design analysis and the LEED Checklist shall be included as an Appendix to the Design Analysis.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --
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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 33 29

SUSTAINABILITY REPORTING

02/15

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   1.6.8 Recycled Content
   1.6.9 Bio-Based Products
   1.6.10 Waste Material Management (Recycling - Construction)
   1.6.11 Ozone Depleting Substances
   1.6.12 Validation and Certification Restrictions

PART 2   PRODUCTS

PART 3   EXECUTION

3.1 SUSTAINABILITY COORDINATION
   3.1.1 Coordinating Sustainability Documentation Progress
3.2 SUSTAINABILITY AWARD
   3.2.1 Third Party Certification Certificates

ATTACHMENTS:

Air Force MILCON Sustainability Requirements Scoresheet
TPC Checklist

Energy Summary Requirements

-- End of Section Table of Contents --
1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)


SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)


U.S. DEPARTMENT OF ENERGY (DOE), Interagency Sustainability Working Group (ISGW)


U.S. GREEN BUILDING COUNCIL (USGBC)


U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247 Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 SUMMARY

This specification includes general requirements and procedures for this project to be constructed and documented per the federally mandated "Guiding Principles" (GP), Third Party Certification (TPC) requirements (if applicable), UFC 1-200-02, High Performance and Sustainable Building Requirements, and other requirements identified in this specification.
1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to this section. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

**SD-01 Preconstruction Submittals**
- Preliminary Sustainability Notebook; G DO
- Preliminary Air Force MILCON Sustainability Requirements Scoresheet

**SD-07 Certificates**
- Third Party Certification (TPC)

**SD-11 Closeout Submittals**
- Final Sustainability Notebook; G DO
- Final Air Force MILCON Sustainability Requirements Scoresheet; G DO
- Amended Final Sustainability Notebook; G DO
- Third Party Certification Certificates; G RO

1.4 GUIDING PRINCIPLES VALIDATION (GPV)

Provide sustainability documentation to verify achievement of Interagency Sustainability Working Group ISWG Guiding Principles Validation (GPV). Provide the following for GPV:

a. Refer to Attachment, Air Force MILCON Sustainability Requirements Scoresheet, at the end of this specification section.

b. Obtain approval of any changes to the Air Force MILCON Sustainability Requirements Scoresheet from the Contracting Officer at the Preconstruction Conference. Contracting Officer's approval establishes identified ISWG Guiding Principles Requirements as the project's sustainability goals.

c. Include all work required to incorporate the applicable ISWG Guiding Principles Requirements indicated on the Air Force MILCON Sustainability Requirements Scoresheet and in this contract.

d. Include documentation to maintain an up-to-date Sustainability Notebook. Supplement documentation containing the following components;
   (1) Air Force MILCON Sustainability Requirements Scoresheet
   (2) Sustainability Action Plan
   (3) Documentation illustrating Guiding Principle (GP) Requirements compliance
(4) Commissioning Plan and Reports

1.4.1 Sustainability Action Plan

Include the following information in the Sustainability Action Plan:

a. Contractor's planned method to achieve each GP requirement.

b. For each designated ISWG Guiding Principles Requirements that is not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

c. Name and contact information for: Contractor's POC responsible for ensuring sustainability goals are accomplished and documentation is assembled.

1.4.2 Costs

Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved ISWG Guiding Principles Requirements.

1.4.3 Third Party Certification (TPC) Documentation

This project shall be designed for, and must be constructed to attain a sustainability rating of LEED GBDC Ref Guide Silver. Project is already registered with the TPC Organization. Provide sustainability documentation, in the format required by the TPC Organization, to the Contracting Officer for approval, and for final approval by the TPC organization. Third Party Certification is met when Government receives TPC organization certificate.

Include the following:

a. Refer to Attachment, TPC Checklist, at the end of this specification section for a blank TPC Checklist.

b. Obtain approval of the TPC Checklist completed by the contractor from the Contracting Officer at the Pre-Construction Conference.

c. Included with this RFP within the Air Force MILCON Sustainability Requirements Scoresheet is a preliminary checklist which has been prepared specifically for this project. At a minimum, the project must meet all LEED Prerequisites and those credits identified with a "Yes" in the first column, or having a point threshold listed. Meeting these criteria alone is not sufficient enough to be eligible for Certification. The Contractor shall select additional credits which they wish to pursue from the optional credits identified with a "Maybe".

The remaining credits have been intentionally excluded from consideration for this project and should only be considered for inclusion after significant discussion with the Government and approval by the Contracting Officer.

d. Complete all work required to incorporate the applicable TPC Requirements.

e. Maintain the information, and provide replacement pages, in the Sustainability Notebook pertaining to additions and changes to the approved sustainability requirements. The Sustainability Notebook is
in electronic format and is explained in the paragraph entitled "SUSTAINABILITY NOTEBOOK". The Sustainability Notebook contains the following components in addition to the GPV components above:

(1) TPC Checklist

(2) Sustainability Action Plan

(3) Completed TPC documentation for each identified prerequisite and credit. Upload onto the TPC Online documentation website.

(4) Copy of all correspondence with the TPC organization.

f. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Action Plan items above:

(1) Contractor's planned method to achieve each TPC requirement.

(2) For each required TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.

(3) Provide the commissioning plan and schedule for performance testing.

(4) Name and contact information for: Contractor's Sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled. Contractor's Sustainability POCs are also responsible for ensuring GPV required in paragraph GUIDING PRINCIPLES VALIDATION (GPV) above.

g. Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved TPC requirements, including but not limited to:

(1) TPC coordination with Government's AE and other consultants, TPC website requirements, and management for documentation.

(2) Construction work required to incorporate TPC prerequisites and credits.

(3) Submittals required to demonstrating compliance with Government approved TPC checklists. Contractor shall facilitate (and accommodate costs associated with) separate design and construction reviews by the TPC organization.

h. Provide all calculations, product data, and certifications required in this contract to demonstrate compliance with the TPC Requirements of this section.

1.4.4 Third Party Certification (TPC)

Project is already registered with TPC organization to achieve level of LEED GBDC Ref Guide Silver. The TPC Online management will be turned over
to the Contractor, who will assume full responsibility for management and obtaining Final Certification. Third Party Certification is met when Government receives TPC organization certificate.

The TPC Certification requires the following:

a. Refer to TPC Checklist at the end of this specification section for a blank TPC Checklist.

b. Obtain approval of the TPC Checklist completed by the contractor from the Contracting Officer at the Pre-Construction Conference.

c. Included with this RFP within the Air Force MILCON Sustainability Requirements Scoresheet is a preliminary checklist which has been prepared specifically for this project. At a minimum, the project must meet all LEED Prerequisites and those credits identified with a "Yes" in the first column, or having a point threshold listed. Meeting these criteria alone is not sufficient enough to be eligible for Certification. The Contractor shall select additional credits which they wish to pursue from the optional credits identified with a "Maybe". The remaining credits have been intentionally excluded from consideration for this project and should only be considered for inclusion after significant discussion with the Government and approval by the Contracting Officer.

d. Complete all work required to incorporate the applicable TPC Requirements.

e. Maintain the information, and provide replacement pages, in the Sustainability Notebook pertaining to additions and changes to the approved sustainability requirements. The Sustainability Notebook is in electronic format and is explained in the paragraph entitled "SUSTAINABILITY NOTEBOOK". The Sustainability Notebook contains the following components in addition to the GPV components above:

   (1) TPC Checklist
   
   (2) Completed TPC Online forms for each identified prerequisite and credit
   
   (3) Copy of all correspondence with the TPC organization including proof of TPC registration
   
   (4) Documentation illustrating compliance with TPC requirements
   
   (5) TPC Award Certificate

f. Include the following information in the Sustainability Action Plan. Provide this TPC information in addition to the GPV Action Plan items above:

   (1) Contractor's planned method to achieve each TPC requirement.
   
   (2) For each required TPC credit that is attempted but not achieved, provide narrative explaining how mission or activity precludes achieving specific sustainability requirement or goal. Provide analysis of particular requirement and level to which project is able to comply.
(3) Name and contact information for: Contractor's Sustainability POC and other names of sustainability professionals on the Contractor's Staff responsible for ensuring TPC sustainability goals are accomplished and documentation is assembled.

(4) Provide the plan and schedule for performance testing, data collection, and commissioning.

g. Contractor is responsible for all costs associated with constructing and demonstrating that project complies with approved TPC requirements, including but not limited to:

   (1) Design TPC review fees and associated documentation changes

      i. Final TPC review, associated documentation changes, and certification fees

   (2) Online TPC management and documentation including revisions.

   (3) Obtaining TPC certification based on Government-approved sustainability goals.

   (4) Construction work required to incorporate TPC prerequisites and credits.

   (5) Submittals required to demonstrate compliance with Government approved TPC checklists.

   g. Provide all calculations, product data, and certifications required in this specification to demonstrate compliance with the TPC Requirements.

   h. Provide all online (or offline, with secure facilities) TPC management and documentation.

   i. Contractor is responsible for all required responses to TPC.

   j. Provide TPC Certificates. Use format below to create the Certificate and Letter of Congratulations. Forward to parties designated by Contracting Officer:

      (1) Certificate:

         Project Title, first line: P-(X); Form DD1391 Project Name).

         Project Title, second line: UIC (Installation code)

      (2) Letter Congratulations:

         Address letter to Facility's Installation commander Name. Address the letter to an individual person.

1.5 SUSTAINABILITY SUBMITTALS

Provide Air Force MILCON Sustainability Requirements Scoresheet and other documentation in the Sustainability Notebook to indicate compliance with the sustainability requirements of the project.
1.5.1  Air Force MILCON Sustainability Requirements Scoresheet

Provide construction documentation that provides proof of and supports compliance with the completed Air Force MILCON Sustainability Requirements Scoresheet.

1.5.1.1  Air Force MILCON Sustainability Requirements Scoresheet Submittals

Submit updated Air Force MILCON Sustainability Requirements Scoresheet in Excel (.xlsx) format with each Sustainability Notebook submittal. Attach final Air Force MILCON Sustainability Requirements Scoresheet to DD1354 Real Property Record Submittal.

1.5.1.2  Air Force MILCON Sustainability Requirements Scoresheet Public Access

Where not included as attachment to this specification section, use the following as Air Force MILCON Sustainability Requirements Scoresheet for respective service branch. Where Internet address appears on two lines, copy full address into Internet browser.


1.5.2  SUSTAINABILITY NOTEBOOK

Provide and maintain a comprehensive Sustainability Notebook to document compliance with the sustainability requirements identified in the approved Air Force MILCON Sustainability Requirements Scoresheet and TPC Checklists. Sustainability Notebook must contain all required data to support full compliance with the ISWG Guiding Principles Requirements and TPC requirements. Sustainability Notebook is in the form of an Adobe PDF file; bookmarked at each ISWG Guiding Principles Requirement, TPC requirement, and sub-bookmarked at each document. Match format to ISWG Guiding Principles numbering system indicated herein. Maintain up to data information, spreadsheets, templates, and other required documentation with each current submittal. For TPC projects, provide a second Table of contents using TPC numbering system. Locate documentation unique to TPC here. Where TPC documentation would repeat GP documentation, insert note referring reviewer to GP documentation.

Contracting Officer may deduct from the monthly progress payment accordingly if Sustainability Notebook information is not current, until information is updated and on track per project goals.

1.5.2.1  Sustainability Notebook Submittal Schedule

Provide Sustainability Notebook Submittals at the following milestones of the project:

- Preliminary Sustainability Notebook(s)

  Submit preliminary Sustainability Notebook for Government review, comment, and approval at each design phase required by this RFP. Include Preliminary Air Force MILCON Sustainability Requirements Scoresheet.

- Construction Progress Meetings. Update GP and TPC documentation in the
Sustainability Notebook and TPC Online tool for each meeting.

c. Final Sustainability Notebook

Submit updated Sustainability Notebook within 60 days after the Beneficial Occupancy Date (BOD). Final progress payment retainage may be held by Contracting Officer until final sustainability documentation is complete. Submit three (3) electronic copies of the Final Sustainability Notebook on DVDs to the Government. Include Final Air Force MILCON Sustainability Requirements Scoresheet.

d. Amended Final Sustainability Notebook

Amend and resubmit the Final Sustainability Notebook to include commissioning, testing and balancing, and collection of performance requirements. Submit three (3) final electronic copies of the Amended Final Sustainability Notebook Submittal on DVDs to the Government no longer than 30 days after the GP, TPC, and Cx designated data collection period.

1.6 DOCUMENTATION REQUIREMENTS

Third Party Certification requirements or credits are mandatory when they have requirements that match a Guiding Principle Requirement. Documentation used to demonstrate TPC compliance may be used to demonstrate GP compliance.

Incorporate each of the following ISWG Guiding Principles Requirements into project construction; and provide documentation that proves compliance with each listed requirement. Items below are organized according to the ISWG Guiding Principles. For projects that require TPC, refer to Third Party Certifier’s reference manuals for TPC requirements.

1.6.1 Commissioning

Work with the Commissioning Authority (CxA) to achieve requirements of the Commissioning plan and other contract document requirements at each stage of commissioning. Maintain up-to-date records of commissioning activities in the Sustainability Notebook, to include commissioning plan and summary commissioning report.

1.6.2 Energy Efficient Equipment

Provide only energy-using equipment that is Energy Star rated, or has the Federal Energy Management Program (FEMP) recommended efficiency. Where Energy Star or FEMP recommendations have not been established, provide most efficient equipment available. Provide only energy using equipment that meets FEMP requirements for low standby power consumption. Energy efficient equipment can be found at: http://www1.eere.energy.gov/femp/ and http://www.energystar.gov/. Provide the following documentation:

Proof that equipment is labeled energy efficient and complies with the cited requirements.

1.6.3 Benchmarking

Provide report of initial actual energy performance with the energy design targets. Provide the following documentation:
Prefinal Performance Report with data collected from the first 60 days of operation of the facility after Beneficial Occupancy Date (BOD). Submit this information with the Final Sustainability Notebook Submittal.

1.6.4 Water Conserving Fixtures

Provide only water-consuming products that are EPA WaterSense labeled, or the most efficient water fixtures available when EPA Watersense products are not available. Provide the following documentation:

Proof that water fixtures are efficient and comply with the cited requirements.

1.6.5 Reduce Volatile Organic Compounds (VOC) (Low Emitting Materials)

Provide materials and products with low pollutant emissions, including composite wood products, adhesives, sealants, interior paints and finishes, carpet systems, and furnishings. Meeting the requirements of ASHRAE 189.1 Sections 8.4.2 (Prescriptive Option: Materials) or Section 8.5.2 (Performance Option: Materials) demonstrates compliance. Insulation products must meet the requirements of Section 8.5.2 (Performance Option: Materials). Provide the following documentation:

a. Demonstrate that materials do not exceed maximum VOC emissions of cited standards. VOC averaging is allowed where coatings are subject to human contact or harsh environmental conditions.

b. Demonstrate that flooring materials comply with VOC emissions of cited standards.

c. Demonstrate that composite wood and agrifiber products and associated laminating adhesives contain no added urea-formaldehyde.

d. Demonstrate that furniture and seating complies with low emissions requirements.

e. Create and maintain a list of above listed products used on the project within the building vapor barrier. Demonstrate how product meets cited standards.

1.6.6 Indoor Air Quality During Construction

Prior to construction, create indoor air quality plan. Implement IAQ plan during construction and flush building air before occupancy.

a. Construction submittal documentation required:

(1) For new construction and for renovation of unoccupied existing buildings, comply with ASHRAE 189.1 Section 10.3.1.4. (Indoor Air Quality (IAQ) Construction Management), with maximum outdoor air consistent with achieving relative humidity no greater than 60 percent. For renovation of occupied existing buildings, comply with ANSI/SMACNA 008 IAQ Guidelines for Occupied Buildings Under Construction.

(2) Provide required documentation showing that after construction ends and prior to occupancy, new HVAC filters were installed, and building air was flushed out in accordance with UFC 1-200-02.
1.6.7 Environmentally Preferred Products

Use products designated for Federal procurement to meet environmentally preferred requirements. Provide the following documentation:

Provide list of environmentally preferable products used on this project that meet the requirements of UFC 1-200-02.

1.6.8 Recycled Content

Provide materials on this project with aggregated total recycled content equal to or greater than 10 percent. In addition, comply with 40 CFR 247. Refer to for assistance identifying products cited in 40 CFR 247. Provide the following documentation:

a. Total amount of recycled content contained in building materials as a percentage of total cost of all building materials on the project (mechanical, electrical, and plumbing components, fire protection equipment and transportation are excluded).

b. Manufacturers documents stating the recycled content by material, or written justification for claiming one of the exceptions allowed under RCRA 6002.

c. Substitutions: Contractor may submit for Government approval, proposed alternative products or systems that provide equivalent performance and appearance and have greater contribution to project recycled content requirements. For all such proposed substitutions, submit with the Sustainability Action Plan accompanied by product data demonstrating equivalence.

1.6.9 Bio-Based Products

Utilize products and material made from biobased materials to the maximum extent possible without jeopardizing the intended end use or detracting from the overall quality delivered to the end user. Use only supplies and materials of a type and quality that conform to applicable specifications and standards.

Biobased products that are designated for preferred procurement under the USDA BioPreferred Program must meet the required minimum biobased content. Refer to http://www.biopreferred.gov for the product categories and BioPreferred Catalog. Provide the following documentation:

a. For biobased products used on this project, provide biobased product content percentage and biobased source of material. Indicate name of the manufacturer, cost of each product and the use of each product on this project.

b. For products that meet USDA Biopreferred Program, provide documentation of USDA Biopreferred label.

1.6.10 Waste Material Management (Recycling - Construction)

Divert construction debris from landfill disposal where markets or on-site recycling exists in accordance with Section 01 74 19 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT. Provide the following documentation:

a. Documentation showing total amount of construction debris diverted from
landfill as a percentage of all construction debris on the project.

b. Include project's Construction Waste Management Plan and all dumpster haul tickets.

1.6.11 Ozone Depleting Substances

The use of CFC-based refrigerants in HVAC&R systems is prohibited. Eliminate the use of ozone depleting substances (CFC's, HCFCs, or Halons) during and after construction where alternative environmentally preferable products are available, taking into account lifecycle impacts. Meet the requirements of ASHRAE 189.1 Section 9.3.3 Refrigerants for no CFC-based refrigerants in heating ventilation, air conditioning and refrigeration systems (except for fire suppression system requirements, covered elsewhere in this specification). Provide the following documentation:

a. MSDS sheets for all refrigerants provided


1.6.12 Validation and Certification Restrictions

The Contractor's purchase of renewable energy certificates (RECs) specifically to meet project sustainability goals is prohibited.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 SUSTAINABILITY COORDINATION

3.1.1 Coordinating Sustainability Documentation Progress

Provide sustainability focus and coordination at the following meetings to achieve sustainability goals. Contractor's designated TPC accredited sustainability professional responsible for GP and TPC documentation must participate in the following meetings to coordinate documentation completion.

a. Pre-Construction Conference: Discuss the following: TPC and Air Force MILCON Sustainability Requirements Scoresheets, Sustainability Action Plan, Construction submittal requirements and schedule, individuals responsible for achieving each Guiding Principle Requirement and TPC prerequisite and credit.

b. Construction Progress Meetings: Review GP and TPC sustainability requirements with project team including contractor and sub-contractor representatives. Demonstrate GP and TPC documentation is being collected and updated to the Sustainability Notebook and TPC Online tool.

(1) Facility Turnover Meetings: Review Sustainability Notebook, and TPC Online submission for completeness and identify any outstanding issues relating to final documentation requirements.
(2) Final Sustainability Notebook Review

3.2  SUSTAINABILITY AWARD

Finalize the sustainability certification process and obtain the TPC Certification Certificates, indicating completion of the projects sustainability goals.

3.2.1  Third Party Certification Certificates

Following the completion of the certification process, the contractor shall order and deliver to the Contracting Officer the original copies of the certificates. Enough copies of the certificates shall be ordered to include a copy for each of the following team members: contractor, Base CE, Omaha District Office, and the Resident Engineer Office. The contractor shall also install a framed copy of the certificate in a location coordinated with the COR, with the designer and contractor's name and logo shown at the bottom in the mat border along with the Corps of Engineers Logo.

-- End of Section --
### General Information

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### LEED® 2009

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### Federal Requirements for High Performance and Sustainable Buildings (HPSB) & UFC 1-200-02

#### HPSB I: Employ Integrated Design Principles (UFC 1-200-02 para 2-2)

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#### UFC 1-200-02 para 2-3. Promote Sustainable Location and Site Development

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**4/25/2017**
Air Force MILCON Sustainability Requirements Scoresheet
version LEED® 2009 (Updated September 2013)

### HPSB II: Optimize Energy Performance (UFC 1-200-02 para 2-4)

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<td>Renewable energy types (check below)</td>
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<td>Solar PV</td>
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<td>Insert generation capacity (KW)</td>
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<td>Insert percentage of total building</td>
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<td>Steam Metering: Select N/A if no service</td>
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### HPSB III: Protect and Conserve Water (UFC 1-200-02 para 2-5)

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<td>Water used for heating and cooling</td>
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### HPSB IV: Enhance Indoor Environmental Quality (UFC 1-200-02 para 2-6)

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<td>Yes</td>
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<td>Protect Indoor Air Quality during Construction</td>
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### HPSB V: Reduce Environmental Impact of Materials (UFC 1-200-02 para 2-6)

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<td>75.0%</td>
<td>Insert percentage diverted from landfill</td>
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### HPSB Totals

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<th>17 Federal Requirements - Yes or N/A</th>
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<td>77% Percentage of Federal Requirements Met</td>
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## Air Force MILCON Sustainability Requirements Scoresheet

**version LEED® 2009 (Updated September 2013)**

* required entry

### LEED® Credits and/or Prerequisites that meet HPSB/UFC Requirements

### LEED® Credits and/or Prerequisites that align closely with HPSB/UFC Requirements

### LEED® Credits that meet USAF Energy & Water Criteria (may depend on technologies & strategies)

### Sustainable Sites

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### Water Efficiency

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### Energy & Atmosphere

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### Materials & Resources

**Achievable Points:** 7  
**Possible Points:** 14

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<td>2. Maintain 75% of Existing Walls Floors &amp; Roof</td>
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<td>3. Maintain 95% of Existing Walls Floors &amp; Roof</td>
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<td>1. 50% Recycled or Salvaged</td>
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<td>Low Emitting Materials, Adhesives &amp; Sealants (HPSB GP4)</td>
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<td>Indoor Chemical &amp; Pollutant Source Control</td>
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### Indoor Environmental Quality

**Achievable Points:** 10  
**Possible Points:** 15

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<td>Increased Ventilation</td>
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### Innovation & Design Process

**Achievable Points:** 3  
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### Regional Priority Credits

**Achievable Points:** 3  
**Possible Points:** 4

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### LEED Project Totals (pre-certification estimates)

**Achievable Points:** 7  
**Possible Points:** 110

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Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80-110

4/25/2017
Project Energy Summary Section of the Design Analysis (DA)

Energy reduction is very important to the goals of the Federal government on all projects. This portion of the DA shall be written in a collaborative manner by the architectural, mechanical, and electrical designers. This is to be a summary section which shall be coordinated and verifiable in the drawings, specifications, other DA sections, and calculations. It is very important that the information presented in this section be inclusive, easily understood, and direct. This portion of the DA shall include the following information and it shall be provided at each design phase and kept current.

1. Indicate the energy criteria the building was design to meet and the year or version of the standard. Example: (ASHRAE 90.1 2007). Indicate or address how conflicts between criteria were addressed and resolved.

2. Indicate the project’s requirement for energy reduction in terms of actual energy reduction. (What is the goal the team strived to meet on this project?)

3. Indicate the energy modeling results attained in terms of actual energy reduction. Information shall summarize the USGBC Energy and Atmosphere (EA) Credit 1 compliance template/form or an equivalently detailed form documenting compliance with the energy reduction requirements. The complete template or form shall be located with the calculation portion of the DA.

4. Provide narrative paragraphs from each discipline which itemizes the integrated design strategies and elements, justification, and their performance requirements which were designed into the facility to attain the modeled energy reduction. Below are example items which would be typically addressed:

Architectural

a. Tested Air barrier, designed to allowable air leakage rate of _____- CFM/SF
b. Wall U-values: ASHRAE Baseline ____ Designed_____
c. Roof U-values: ASHRAE Baseline ____ Designed_____
d. Floor U-values: ASHRAE Baseline ____ Designed_____
e. Window performance: U-value_____
f. Window performance: Solar performance_____
g. Door performance: ASHRAE Baseline ____ Designed_____
h. Sun shades
i. Day-lighting strategy
j. Building orientation
k. Building solar reflectance
l. Fire protection Occupancy
m. LEED FTE Occupancy
n. Plumbing count Occupancy
o. Parking lot sizing Occupancy
p. Etc.

Mechanical

a. Energy model % savings compared to Baseline
b. Overall building load distribution: Envelope (walls, roof, and openings) _____ %, Internal (people & misc) _____ %,
   Lighting ____ %, Plug and Process____%
c. Energy recovery
b. Cooling equipment (Fan coils, Air Handling Unit)
c. Heat rejection equipment (Chiller, geothermal)
d. Heating equipment (Boiler, Electric Heat)
e. Use of internal functions or processes
f. Solar walls
g. Ventilation
h. Economizers
i. Application of variable frequency drives
j. Etc.
Electrical

a. Renewable (PV and Wind) energy providing _____%

b. Day-lighting reducing energy consumption by ____%.

c. Alternative lighting systems

d. Lighting occupancy and day-lighting sensors

e. Lighting watts/sq foot goal and analysis (by room and/or building average) ASHRAE Baseline _____
   Designed_____

f. Parking lot lighting ASHRAE Baseline ___  Designed_____

g. Sub-metering

h. Receptacle switching in accordance with ASHRAE 90.1 requirements

i. Etc.

Attach completed ASHRAE 189.1-09 compliance Check Lists
# Project Scorecard

**Project Name:** FY17 SMALL ARMS RANGE COMPLEX  
**Project Address:** Buckley AFB, CO

## SUSTAINABLE SITES

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<td>Development Density and Community Connectivity</td>
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<td>Alternative Transportation - Public Transportation Access</td>
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<td>Alternative Transportation - Bicycle Storage and Changing Rooms</td>
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<td>Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles</td>
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<td>Site Development - Protect or Restore Habitat</td>
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<td>Site Development - Maximize Open Space</td>
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## WATER EFFICIENCY

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## ENERGY & ATMOSPHERE

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**LEED 2009 for New Construction and Major Renovation**

**Project Scorecard**

**Project Name:** FY17 SMALL ARMS RANGE COMPLEX  
**Project Address:** Buckley AFB, CO
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| Credit 3 | Enhanced Commissioning | 2 |
| Credit 4 | Enhanced Refrigerant Management | 2 |
| Credit 5 | Measurement and Verification | 3 |
| Credit 6 | Green Power | 2 |

### MATERIALS & RESOURCES

| Prereq 1 | Storage and Collection of Recyclables | Required |

| Credit 1.1 | Building Reuse - Maintain Existing Walls, Floors and Roof | 1 to 3 |
| Reuse 55% | 1 |
| Reuse 75% | 2 |
| Reuse 95% | 3 |

| Credit 1.2 | Building Reuse - Maintain Interior Nonstructural Elements | 1 |
| Credit 2 | Construction Waste Management | 1 to 2 |
| 50% Recycled or Salvaged | 1 |
| 75% Recycled or Salvaged | 2 |

| Credit 3 | Materials Reuse | 1 to 2 |
| Reuse 5% | 1 |
| Reuse 10% | 2 |

| Credit 4 | Recycled Content | 1 to 2 |
| 10% of Content | 1 |
| 20% of Content | 2 |

| Credit 5 | Regional Materials | 1 to 2 |
| 10% of Materials | 1 |
| 20% of Materials | 2 |

| Credit 6 | Rapidly Renewable Materials | 1 |
| Credit 7 | Certified Wood | 1 |

### INDOOR ENVIRONMENTAL QUALITY

| Prereq 1 | Minimum Indoor Air Quality Performance | Required |

<p>| Prereq 2 | Environmental Tobacco Smoke (ETS) Control | Required |
| Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| Credit 2 | Increased Ventilation | 1 |
| Credit 3.1 | Construction Indoor Air Quality Management Plan - During Construction | 1 |
| Credit 3.2 | Construction Indoor Air Quality Management Plan - Before Occupancy | 1 |
| Credit 4.1 | Low-Emitting Materials - Adhesives and Sealants | 1 |
| Credit 4.2 | Low-Emitting Materials - Paints and Coatings | 1 |
| Credit 4.3 | Low-Emitting Materials - Flooring Systems | 1 |
| Credit 4.4 | Low-Emitting Materials - Composite Wood and Agrifiber Products | 1 |
| Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| Credit 6.1 | Controllability of Systems - Lighting | 1 |</p>
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GOVERNMENTAL SAFETY REQUIREMENTS

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1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.22 (2007; R 2012) Safety Requirements for Rope-Guided and Non-Guided Workers’ Hoists

ASSE/SAFE A10.34 (2001; R 2012) Protection of the Public on or Adjacent to Construction Sites

ASSE/SAFE A10.44 (2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations

ASSE/SAFE Z244.1 (2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods

ASSE/SAFE Z359.0 (2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest

ASSE/SAFE Z359.1 (2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASSE/SAFE Z359.11 (2014) Safety Requirements for Full Body Harnesses

ASSE/SAFE Z359.12 (2009) Connecting Components for Personal Fall Arrest Systems

ASSE/SAFE Z359.13 (2013) Personal Energy Absorbers and Energy Absorbing Lanyards


ASSE/SAFE Z359.15 (2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems

ASSE/SAFE Z359.2 (2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program

ASSE/SAFE Z359.3 (2007) Safety Requirements for Positioning
and Travel Restraint Systems


ASSE/SAFE Z359.6  (2009) Specifications and Design Requirements for Active Fall Protection Systems

ASSE/SAFE Z359.7  (2011) Qualification and Verification Testing of Fall Protection Products

ASME INTERNATIONAL (ASME)


ASME B30.22  (2016) Articulating Boom Cranes


ASME B30.3  (2016) Tower Cranes

ASME B30.5  (2014) Mobile and Locomotive Cranes

ASME B30.7  (2011) Winches

ASME B30.8  (2015) Floating Cranes and Floating Derricks


ASTM INTERNATIONAL (ASTM)


INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)


NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10  (2013) Standard for Portable Fire Extinguishers

NFPA 241  (2013; Errata 2015) Standard for Safeguarding Construction, Alteration, and
Demolition Operations

**NFPA 51B**
(2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work

**NFPA 70**
(2017) National Electrical Code

**NFPA 70E**
(2015; ERTA 1 2015) Standard for Electrical Safety in the Workplace

**TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)**

**TIA-1019**
(2012; R 2016) Standard for Installation, Alteration and Maintenance of Antenna Supporting Structures and Antennas

**TIA-222**
(2005G; Add 1 2007; Add 2 2009; Add 3 2014; Add 4 2014; R 2014; R 2016) Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

**U.S. ARMY CORPS OF ENGINEERS (USACE)**

**EM 385-1-1**

**U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)**

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<td>Occupational Safety and Health Standards</td>
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<td>Safety and Health Regulations for Construction</td>
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<td>Cranes and Derricks in Construction</td>
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<td>Rules of Construction</td>
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1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with
ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered
professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.17 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document an LHE mishap using the Crane High Hazard working group mishap reporting form (Available at local USACE Safety Office).
1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. If elected by the Contracting Officer's Representative, submittals in this section may be handled as an Administrative Submittals as defined in Section 01 33 00 SUBMITTAL PROCEDURES. Submittals include the following:

SD-01 Preconstruction Submittals
  Accident Prevention Plan (APP); G, RO

SD-06 Test Reports
  Monthly Exposure Reports
  Notifications and Reports
  Accident Reports; G, RO
  LHE Inspection Reports

SD-07 Certificates
  Crane Operators/Riggers
  Standard Lift Plan; G, RO
  Critical Lift Plan; G, RO

  Activity Hazard Analysis (AHA)
  Confined Space Entry Permit
  Hot Work Permit
  Certificate of Compliance

  License Certificates

  Portable Gauge Operations Planning Worksheet; G, RO

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.
1.5  REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6  SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.6.1  Personnel Qualifications

1.6.1.1  Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.6.1.1.1  Additional Site Safety and Health Officer (SSHO) Requirements and Duties

The SSHO may not serve as the Quality Control Manager. The SSHO may not serve as the Superintendent.

1.6.1.2  Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for information in consultation with the Safety Office.
1.6.1.2.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space in accordance with EM 385-1-1, Section 34.

1.6.1.2.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.6.1.2.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.6.1.3 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards, Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.6.1.4 Crane Operators/Riggers

1.6.2 Personnel Duties

1.6.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use and maintain OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors, and make available to the Contracting Officer upon request. Post and maintain the Form 300A on the site Safety Bulletin Board.

d. Maintain applicable safety reference material on the job site.

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager,
b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin work until an APP is established that is acceptable to the Contracting Officer.

d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.6.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.7 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety
Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.7.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.7.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.7.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the
event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.7.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.7.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. In addition, Critical Lift Plans are required for the following:

a. Lifts over 50 percent of the capacity of barge mounted mobile crane's hoist.

b. When working around energized power lines where the work will get closer than the minimum clearance distance in EM 385-1-1 Table 16-1.

c. For lifts with anticipated binding conditions.

d. When erecting cranes.

1.7.2.3.1 Critical Lift Plan Planning and Schedule

Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

1.7.2.3.2 Lifts of Personnel

In addition to the requirements of EM 385-1-1, Section 16.H.02, for lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

1.7.2.4 Multi-Purpose Machines, Material Handling Equipment, and Construction Equipment Lift Plan

Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Written approval from a qualified registered professional engineer, after a safety analysis is performed, is allowed in lieu of the OEM's approval. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.
1.7.2.5 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.7.2.6 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.7.2.7 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.7.2.8 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

1.7.2.9 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 83 19.13 10 LEAD BASED PAINT ABATEMENT.

1.7.2.10 Asbestos Hazard Abatement Plan

Identify the safety and health aspects of asbestos work, and prepare in accordance with Section 02 82 13.00 10 ASBESTOS ABATEMENT.

1.7.2.11 Site Safety and Health Plan

Identify the safety and health aspects, and prepare in accordance with
Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

1.7.2.12 PCB Plan

Identify the safety and health aspects of Polychlorinated Biphenyls work, and prepare in accordance with Sections 02 84 33 REMOVAL AND DISPOSAL OF POLYCHLORINATED BIPHENYLS (PCBs) and 02 61 23 REMOVAL AND DISPOSAL OF PCB CONTAMINATED SOILS.

1.7.2.13 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 [DEMOLITION] [AND] [DECONSTRUCTION] and referenced sources.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.8.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.8.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.9 DISPLAY OF SAFETY INFORMATION

1.9.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety
bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.07. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.9.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.12 NOTIFICATIONS and REPORTS

1.12.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, or any property damage. For LHE or rigging mishaps, notify the Contracting Officer as soon as practical but not more than 4 hours after mishap. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.
Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.12.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report ENG Form 3394, and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: For Army projects, report all "Near Misses" to the GDA, using local mishap reporting procedures, within 24 hrs. The Contracting Officer will provide the Contractor the required forms. Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment accident (including rigging accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Accident Report) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.12.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.12.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13 HOT WORK

1.13.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e.
welding or cutting) or operating other flame-producing/spark producing devices, from the Contracting Officer's Representative. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and knowledge of emergency response plan and emergency phone numbers/contacts. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DEPARTMENT OR CONTRACTING OFFICER IMMEDIATELY.

1.13.2 Work Around Flammable Materials

Obtain permit approval from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.14 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer and Radiation Safety Office (RSO) for all specialized and licensed material and equipment proposed for use on the construction project (excludes portable machine sources of ionizing radiation including moisture density and X-Ray Fluorescence (XRF)). Maintain on-site records whenever licensed radiological materials or ionizing equipment are on government property.

Protect workers from radiation exposure in accordance with 10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.15 CONFINED SPACE ENTRY REQUIREMENTS

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.15.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate
tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.15.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

1.15.3 Sewer Wet Wells

Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

1.15.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.16 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Hard Hat

b. Long Pants
c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work, notify the Contracting Officer immediately and determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4, "Changes" and FAR 52.236-2, "Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages per Section 01 30 00.24 OTHER ADMINISTRATIVE AND SPECIAL REQUIREMENTS. At a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance
3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.


3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.0 through 21.0.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a
minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.

(2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:12 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a
Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than 6 feet.

k. Delineate fall protection requirements when working above 6 feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.
3.5.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.6.2 Load Handling Equipment (LHE)

The following requirements apply. In exception, these requirements do not apply to commercial truck mounted and articulating boom cranes used solely to deliver material and supplies (not prefabricated components, structural steel, or components of a systems-engineered metal building) where the lift consists of moving materials and supplies from a truck or trailer to the ground; to cranes installed on mechanics trucks that are used solely in the repair of shore-based equipment; to crane that enter the activity but are not used for lifting; nor to other machines not used to lift loads suspended by rigging equipment. However, LHE accidents occurring during such operations must be reported.

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the
work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. As applicable, comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. As applicable, when operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

f. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

g. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

h. All employees must keep clear of loads about to be lifted and of suspended loads, except for employees required to handle the load.

i. Use cribbing when performing lifts on outriggers.

j. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

k. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

l. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

m. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

n. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

o. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.
3.6.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 Base Mounted Drum Hoists

a. Operation of base mounted drum hoists must comply with EM 385-1-1 and ASSE/SAFE A10.22.

b. Rigging gear must comply with applicable ASME/OSHA standards.

c. When used on telecommunication towers, base mounted drum hoists must comply with TIA-1019, TIA-222, ASME B30.7, 29 CFR 1926.552, and 29 CFR 1926.553.

d. When used to hoist personnel, the AHA must include a written standard operating procedure. Operators must have a physical examination in accordance with EM 385-1-1 Section 16.B.05 and trained, at a minimum, in accordance with EM 385-1-1 Section 16.U and 16.T. The base mounted drum hoist must also comply with OSHA Instruction CPL 02-01-056 and ASME B30.23.

e. Material and personnel must not be hoisted simultaneously.

f. Personnel cage must be marked with the capacity (in number of persons) and load limit in pounds.

g. Construction equipment must not be used for hoisting material or personnel or with trolley/tag lines. Construction equipment may be used for towing and assisting with anchoring guy lines.

3.6.5 Use of Explosives

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.
3.7.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area.

3.7.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within 3 feet of the underground system.

3.7.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.8.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as
delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.8.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local requirements applicable to where work is being performed.

3.8.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.8.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

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DIVISION 01 - GENERAL REQUIREMENTS

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(FEDERAL FACILITIES COLORADO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES

02/07

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-- End of Section Table of Contents --
PART 1   GENERAL

1.1 REFERENCES (Not Applicable)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Inspector Qualifications

Name and qualifications of all personnel who will be performing inspections on the site.

PART 2   PRODUCTS (Not Applicable)

PART 3   EXECUTION

3.1 GENERAL

The Contractor shall be responsible for implementing the terms and requirements of the attached National Pollutant Discharge Elimination System General Permit for Discharges from Construction Activities (Permit No. COR12000F, hereinafter called "the permit") as specified below. The Government and the Contractor shall be considered co-permittees. The Government has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications. The Contractor shall have day-to-day operational control of those activities which are necessary to ensure compliance with the requirements specified herein. The Contractor shall be responsible for all submissions to the EPA and shall retain the official copy of all documents pertaining to compliance with the permit during construction. The project site is not located in designated critical habitat and there are no known "listed species" located in the project area.

3.2 IMPLEMENTATION

3.2.1 Notice of Intent

The Contractor shall electronically complete and sign a Notice of Intent (NOI) in accordance with the Permit. The Contractor shall notify the Contracting Officer's Representative within 24 hours after submitting his
NOI. The Contractor shall not submit his NOI to the EPA until his Storm Water Pollution Prevention Plan has been accepted by the Government. After completion of the electronic NOI, a 14-day waiting period begins. The EPA will give the Contractor authorization that his NOI is in effect after the 14-day waiting period. The Contractor may not begin land disturbance activities until authorized by the Contracting Officer.

3.2.2 Storm Water Pollution Prevention Plan

3.2.2.1 General

The Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) for the project. The Government has responsibilities as the permittee with operational control over construction plans and specifications. The Contractor's responsibilities include all other requirements described in the general permit. The Government will provide the Contractor with a SWPPP template to use if he chooses. The Contractor shall include appropriate controls and measures for any off-site support activities covered under the permit. The SWPPP shall describe the nature and location of the activity and a location map and site map shall be included in accordance with the permit. The Contractor shall be responsible for implementing, maintaining and updating the SWPPP (including Site Map) during construction. Unless otherwise indicated, the Contractor shall be responsible for implementing all measures described in the SWPPPs. The Contractor shall maintain the following records and attach to his SWPPP: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated. The SWPPP shall be signed by the Contractor and the Government. A copy of the written authorization shall be attached to the SWPPP for any person signing the SWPPP or Inspection Reports other than the person described in the permit. If major changes to the SWPPP are required during construction, the SWPPP shall be recertified by the Contractor.

3.2.2.2 Acceptance of SWPPP

Acceptance of the SWPPP is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes to the SWPPP if the Contracting Officer determines that environmental protection requirements are not being met.

3.2.2.3 Notification of Changes

After acceptance of the SWPPP, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.2.3 Posting Notice

The Contractor shall post copies of each of the NOI's electronically submitted to the EPA Storm Water Notice Processing Center. The NOI shall be posted conspicuously near the main entrance of the construction site.

3.2.4 Inspections and Reporting

The Contractor shall be responsible for all inspections required by the general permit. The Contractor shall also prepare and sign all reports.
summarizing the inspections as required by the general permit. Copies of inspection reports shall be attached to the Contractor's SWPPP and provided to the Contracting Officer's Representative within 24 hours after completion of each inspection. The Contractor shall notify the Contracting Officer within 24 hours if an inspection identifies any incidents of non-compliance with the SWPPP and the general permit.

3.2.4.1 Inspector Qualifications

Contractor personnel performing inspections shall be knowledgeable in the principles and practice of erosion and sediment controls and possess the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction site. The Contractor shall submit the name and qualifications of all personnel who will be performing inspections on the site.

3.2.5 Maintenance

The Contractor shall be responsible for maintaining all erosion and sediment control measures and other protective measures identified in the SWPPP in an effective operating condition. The Government reserves the right to require the Contractor to perform maintenance on erosion and sediment control measures and other protective measures if the Contracting Officer determines that environmental protection requirements are not being met.

3.2.6 Notice of Termination

The Contractor shall establish a stand of grass in all disturbed areas of the project not otherwise surfaced and shall meet the requirements for "Final Stabilization" as defined in the permit prior to terminating permit coverage. The Contractor shall notify the Contracting Officer within 2 working days after final stabilization on all portions of the site has been achieved in accordance the permit. The Contractor shall electronically complete and sign a Notice of Termination (NOT) in accordance with the permit. A copy of the Contractor's NOT and the updated SWPPP shall be furnished to the Contracting Officer within 5 calendar days after final stabilization has been achieved on all portions of the site.

3.2.7 Retention of Records

After the Contractor submits his NOT, the Government shall be responsible for retaining copies of the SWPPP and all reports in accordance with the permit.

3.2.8 Continuation of Expired Permit

If the current permit expires prior to completion of construction, the Contractor shall comply with the conditions of the new permit.

-- End of Section --
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Sample Quality Control Report (QCR) Form

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D3740 (2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction


U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-12 (2006; Change 1) Engineering and Design -- Quality Management

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program. Include all associated costs in the applicable Pricing Schedule item.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G, RO

Additional Requirements for Design Quality Control (DQC) Plan; G, DO

SD-05 Design Data

Discipline-Specific Checklists

SD-06 Test Reports
PART 2  PRODUCTS
Not Used

PART 3  EXECUTION

3.1  GENERAL REQUIREMENTS

Submit Quality Control Personnel experience as submitted per the requirements of Section 00 22 00 PROPOSAL SUBMISSION REQUIREMENTS, INSTRUCTIONS AND EVALUATION. If, because of reasons beyond the control of the Contractor, the named individuals are not able to fulfill this obligation, present replacement personnel with equal or better skills and experience for acceptance by the Contracting Officer. Obtain the Contracting Officer's written consent before making any substitution for these designated personnel.

Establish and maintain an effective quality control (QC) system that complies with the Contract Clause titled "Inspection of Construction." QC consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all design and construction operations, both onsite and offsite, and be keyed to the proposed design and construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2  CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The Government will consider an interim plan for the first 30 days of operation. Design and construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1  Content of the CQC Plan

Include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including subcontractors designers of record, consultants, architect/engineers (AE), fabricators, suppliers and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work
specified. Include a CQC System Manager that reports to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the Contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer are required to be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

### 3.2.2 Additional Requirements for Design Quality Control (DQC) Plan

The following additional requirements apply to the Design Quality Control (DQC) plan:

a. Submit and maintain a Design Quality Control (DQC) Plan as an effective quality control program which assures that all services required by this contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, all documents must be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element
that produced the product may not perform the independent technical
review (ITR). Correct errors and deficiencies in the design documents
prior to submitting them to the Government.

b. Include the design schedule in the master project schedule, showing the
sequence of events involved in carrying out the project design tasks
within the specific Contract period. This should be at a detailed
level of scheduling sufficient to identify all major design tasks,
including those that control the flow of work. Include review and
correction periods associated with each item. This should be a forward
planning as well as a project monitoring tool. The schedule reflects
calendar days and not dates for each activity. If the schedule is
changed, submit a revised schedule reflecting the change within 7
calendar days. Include in the DQC Plan the discipline-specific
checklists to be used during the design and quality control of each
submittal. Submit at each design phase as part of the project
documentation these completed discipline-specific checklists.
ER 1110-1-12 provides some useful information in developing checklists.

c. Implement the DQC Plan by a Design Quality Control Manager who has the
responsibility of being cognizant of and assuring that all documents on
the project have been coordinated. This individual must be a person
who has verifiable engineering or architectural design experience and
is a registered professional engineer or architect. Notify the
Contracting Officer, in writing, of the name of the individual, and the
name of an alternate person assigned to the position.

(4) The DQC Manager is responsible for reporting to the overall Project
Manager of the Contractor for the design-build contract. The Project
Manager will be held responsible for the quality of design on the
contract and is subject to removal by the Contracting Officer for
non-compliance with the quality requirements specified in the contract.

The Contracting Officer will notify the Contractor in writing of the
acceptance of the DQC Plan. After acceptance, any changes proposed by the
Contractor are subject to the acceptance of the Contracting Officer.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of
design and construction. Acceptance is conditional and will be predicated
on satisfactory performance during the design and construction. The
Government reserves the right to require the Contractor to make changes in
the Contractor Quality Control (CQC) Plan and operations including removal
of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing
of any proposed change. Proposed changes are subject to acceptance by the
Contracting Officer.

3.3 COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and
prior to acceptance by the Government of the CQC Plan, meet with the
Contracting Officer and discuss the Contractor's quality control system.
Submit the CQC Plan a minimum of 10 calendar days prior to the Coordination
Meeting. During the meeting, a mutual understanding of the system details
must be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Contractor, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There can be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, a Design Quality Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a graduate of construction management, with a minimum of 5 years construction experience on construction similar to this Contract. This CQC System Manager is on the site at all times during construction and is employed by the prime Contractor. The CQC System Manager is assigned no other duties. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 CQC Personnel

Maintain a staff under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. Clearly state the duties and responsibilities of each staff member in the QC Plan. Other technical specifications may specify individuals for maintaining quality control for specific areas of work.
Identify a separate Design Quality Control Manager who is a Registered Architect or Professional Engineer. This DQC Manager is considered part of the Contractor's Quality Control staff but reports directly to the overall Project Manager for the Contractor for the design-build contract.

3.4.4 Assignment of CQC System Manager, Project Superintendent, and SSHO Responsibilities

The CQC System Manager, Project Superintendent, and SSHO may not share duties and are required to be separate individuals.

3.4.5 Additional Requirement

In addition to the above experience and education requirements, the Contractor Quality Control (CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered at offices indicated at the following web site:


The exact date and location for the sessions will be determined approximately 30 days in advance by the trainer (POC). Cost varies by location per student.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.6 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 01 91 00.15 TOTAL BUILDING COMMISSIONING are included in the contract, the submittals required by those sections have to be coordinated with Section 01 33 00 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

CQC is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:
3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.


c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.

f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. Schedule all preparatory inspections two(2) weeks in advance. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify
required control inspection and testing are in compliance with the contract.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government needs to be notified at least 48 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.

g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply
with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

3.7.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at: http://www.erdc.usace.army.mil/Media/FactSheets.aspx

Under "Geotechnical and Structures Lab (GSL) Facilities", Click on "Materials Testing Center" Link
Click on Link for "Validated Laboratories".

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel is required to meet criteria detailed in ASTM D3740 and ASTM E329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed the actual cost for the recheck to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the Contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.
3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in the SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS) Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative is required to be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands can also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. The name and area of responsibility of the Contractor/Subcontractor.
b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions. Include information identified by the "Responsible Individual(s)" for Safety as outlined in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identification of the Independent Technical Review (ITR) team, the ITR review comments, responses and the record of resolution of the comments.

k. Verification Statement.

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Contracting Officer's Representative on the first day following the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. The Government may elect to process these records electronically. Coordinate with the Contracting Officer's Representative. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the Contractor Quality Control (CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 SAMPLE FORMS

Generate daily quality control reports using the Government-furnished Construction Contractor Module of RMS specified in Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM). A Sample Quality
Control Report (QCR) Form is attached at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.
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RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)

11/16; OMH 03/17

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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)


1.2 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Contractor uses the Government-furnished Construction Contractor Mode of RMS, referred to as RMS3/CM, to record, maintain, and submit various information throughout the contract period. The Contractor mode user manuals, updates, and training information can be downloaded from the RMS web site at: http://rmsdocumentation.com/. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. RMS3/CM provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Import/Export of Data
Closeout

1.2.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible between the Government and Contractor. Correspondence, pay requests and other documents comprising the official contract record are also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2.2 Other Factors

Particular attention is directed to Contract Clause, "Schedules for Construction Contracts", Contract Clause, "Payments", Section 01 32 01.00 10 PROJECT SCHEDULE, Section 01 33 00 SUBMITTAL PROCEDURES, and Section 01 45 00.00 10 QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through RMS. Also, there is no separate
payment for establishing and maintaining the RMS3/CM database; costs associated will be included in the contract pricing for the work.

1.3 RMS3/CM SOFTWARE

RMS is a Windows-based program that can be run on a Windows based PC meeting the requirements as specified in Section 1.4. The Contractor will be granted access to the contract in RMS3/CM after award of the construction contract.

Prior to the Pre-Construction Conference, the Contractor will be responsible to download, install and initiate entry of contractor data, such as pre-construction submittals, subcontractors, and schedule. Any program updates of RMS3/CM will be installed automatically each time the software is launched.

1.3.1 RMS3/CM CONTRACTOR'S MODE (CM)

RMS Contractor's Mode or RMS3/CM is the replacement for Quality Control System or QCS. The database remains the same. References to RMS in this specification includes RMS3/CM.

1.4 SYSTEM REQUIREMENTS

The following is the minimum system configuration required to run RMS3/CM:

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1.5 RELATED INFORMATION

1.5.1 RMS User Guide

After contract award, download instructions for the installation and use of RMS3/CM from the Government RMS Internet Website (RMS at: http://rmsdocumentation.com/).

1.5.2 Contractor Quality Control (CQC) Training

The use of RMS3/CM will have been discussed with the QC System Manager during the mandatory CQC Training class.

1.6 CONTRACT DATABASE

Data is entered by both Government and Contractor into a shared database. Inputs are live and are immediately visible to both parties. Prior to the pre-construction conference, the Government will input basic contract award data and will continue to provide feedback (submittal reviews, correspondence status, Quality Assurance (QA) comments, and other administrative data) using RMS3 for the duration of the contract. In turn, the Contractor will input its data into RMS3/CM.

1.7 DATABASE MAINTENANCE

Establish, maintain, and update data in the RMS3/CM database throughout the duration of the contract. Submit data updates to the Government (e.g., daily reports, submittals, RFI's, schedule updates, payment requests) using RMS3/CM. The RMS3 database typically includes current data on the following items:

1.7.1 Administration

1.7.1.1 Contractor Information

Contain within the database the Contractor's name, address, telephone numbers, management staff, and other required items. Within 7 calendar days of receiving access to the contract in RMS3/CM, enter Contractor administrative data.

1.7.1.2 Subcontractor Information

Within 7 calendar days of receiving access to the contract in RMS3/CM enter the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed. Assign each subcontractor/trade a unique Responsibility Code, provided in RMS3/CM.

1.7.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C". Submit all correspondence and attachments through RMS3/CM. All correspondence shall be signed.
1.7.1.4 Equipment Checks

Contain within the Contractor's RMS3/CM database a current list of equipment planned for use or being used on the jobsite, including the most recent equipment inspection dates.

1.7.1.5 Request For Information (RFI)

Exchange all Requests For Information (RFI) using the Built-in RFI generator and tracker in RMS3/CM.

1.7.2 Finances

1.7.2.1 Pay Activity Data

Include within the RMS3/CM database a list of pay activities that the Contractor develops in conjunction with the construction schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities equals the amount of each CLIN. The sum of all CLINs equals the contract amount.

1.7.2.2 Payment Requests

Prepare all progress payment requests using RMS3/CM. Complete the payment request worksheet, prompt payment certification, and payment invoice in RMS3/CM. Update the work completed under the contract, measured as percent or as specific quantities, at least monthly. After the update, generate a payment request report using RMS3/CM. Submit the payment request, prompt payment certification, and payment invoice with supporting data using RMS3/CM. If permitted by the Contracting Officer, email or an optical disc may be used. A signed paper copy of the approved payment request is also required and will govern in the event of discrepancy with the electronic version.

1.7.3 Quality Control (QC)

RMS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements. Maintain this data on a daily basis. Entered data will automatically output to the RMS3/CM generated daily report. Provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 00.00 10 QUALITY CONTROL. Within seven calendar days of Government acceptance, update RMS3/CM with the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.7.3.1 Daily Contractor Quality Control (CQC) Reports.

RMS3/CM includes the means to produce the Daily QC Report. The Contractor can use other formats to record basic Quality Control (QC) data. However, the Daily QC Report generated by RMS3/CM must be the Contractor's official report. Summarize data from any supplemental reports by the Contractor and consolidate onto the RMS3/CM-generated Daily QC Report. Submit daily QC Reports as required by Section 01 45 00.00 10 QUALITY CONTROL. Electronically submit reports to the Government within 24 hours after the date covered by the report. Also provide the Government a signed, printed copy of the daily QC report.
1.7.3.2 Deficiency Items

Use RMS3/CM to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using its Quality Control (QC) punch list items. Maintain a current log of its QC punch list items in the RMS3/CM database. The Government will log the deficiencies it has identified using its Quality Assurance (QA) punch list items. The Government's QA punch list items will be included in its export file to the Contractor. Regularly update the correction status of both QC and QA punch list items.

1.7.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS3/CM.

1.7.3.4 Features of Work

Include a complete list of the features of work in the RMS3/CM database. A feature of work is associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.7.3.5 Hazard Analysis

Use RMS3/CM to develop a hazard analysis for each feature of work included in the CQC Plan. The Activity Hazard Analysis will include information required by EM 385-1-1, paragraph 01.A.13.

1.7.3.6 QC Requirements

Develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in RMS3/CM. Update data on these QC requirements as work progresses.

1.7.3.7 Management Reporting

RMS3/CM includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of RMS3/CM. Among these reports are: Progress Payment Request worksheet, Quality Assurance/Quality Control (QA/QC) comments, Submittal Register Status, Three-Phase Control checklists.

1.7.3.8 Exposure Hours

Log labor and equipment exposure hours on a daily basis. The labor and equipment exposure data will be rolled up into a monthly exposure report.

1.7.3.9 Accident/Safety Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will available in RMS3/CM. Regularly update the correction status of the safety comments. In addition, utilize RMS3/CM daily reports and exposure hours to advise the Government of any accidents occurring on the jobsite. A brief supplemental entry of an accident is not to be considered as a substitute.
1.7.4 Submittal Management

The Government will input the initial submittal register in RMS3. Thereafter, maintain a complete list of submittals, including completion of data columns. Dates when submittals are received and returned by the Government will be tracked in RMS3. Use RMS3/CM to track and transmit submittals. ENG Form 4025, submittal transmittal form, and the submittal register update must be produced using RMS3/CM. RMS3 will be used to update, store and exchange submittal registers and transmittals. In addition to requirements stated in specification 01 33 00, actual submittals are to be stored in RMS3/CM, with hard copies also provided (if required). Exception will be where the Contracting Officer specifies only hard copies required, where size of document cannot be saved in RMS3/CM, and where samples, spare parts, color boards, and full size drawings are to be provided.

1.7.5 Schedule

Develop a construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10 PROJECT SCHEDULE or Contract Clause, "Schedules for Construction Contracts". Input and maintain in the RMS database the schedule either manually or by using the Standard Data Exchange Format (SDEF). Include with each pay request the updated schedule. Provide electronic copies of transmittals.

1.7.6 Import/Export of Data

RMS includes the ability to import schedule data using SDEF.

1.8 IMPLEMENTATION

Use of RMS3/CM as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS3/CM with current information. RMS3/CM is an integral part of the Contractor's management of quality control.

1.9 MONTHLY COORDINATION MEETING

Update the RMS3/CM database each workday. As required in Contract Clause "Payments", at least one week prior to submittal of the progress payment request, meet with the Government representative to review the planned progress payment data submission for errors and omissions. Make all required corrections prior to Government acceptance of the progress payment request. Payment requests accompanied by incomplete or incorrect data will be returned. The Government will not process progress payments until all required data is received.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. Take immediate corrective action after receipt of such notice. Such notice, when
delivered to the Contractor, will be deemed sufficient for the purpose of notification.

PART 2   PRODUCTS
Not Used

PART 3   EXECUTION
Not Used

-- End of Section --
PART 1  GENERAL

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-- End of Section Table of Contents --
PART 1 GENERAL

Attachment:
Recommended Best Management Practices for Buckley AFB, CO

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. AIR FORCE (USAF)


U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2008; Change 1-2010; Change 3-2010; Errata 1-2010) Safety and Health Requirements Manual

WETLAND MANUAL Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

33 CFR 328 Definitions of Waters of the United States
40 CFR 152 - 186 Pesticide Programs
40 CFR 260 Hazardous Waste Management System: General
40 CFR 261 Identification and Listing of Hazardous Waste
40 CFR 262 Standards Applicable to Generators of Hazardous Waste
40 CFR 279 Standards for the Management of Used Oil
40 CFR 302 Designation, Reportable Quantities, and Notification
40 CFR 355 Emergency Planning and Notification
40 CFR 68 Chemical Accident Prevention Provisions
49 CFR 171 - 178 Hazardous Materials Regulations
1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management Plan.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of
personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 SUBMITTALS

The following administrative submittals shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

   Environmental Protection Plan
1.7 ENVIRONMENTAL COORDINATION, PERMITS, NOTICES, REVIEWS AND/OR APPROVALS

The Contractor shall be responsible for contacting the appropriate Federal, State, Regional, and local environmental agencies to identify all required environmental permits (construction and operating), notices, reviews, and approvals required for the project. Once the requirements are identified, the Contractor shall be responsible for coordinating the requirements with the Environmental Flight and the Contracting Officer in regard to implementation for a Federal Facility project. In addition, the Environmental Flight of Buckley AFB shall be provided a copy of any permit applications prior to submission to the regulating agency, and shall also be provided a copy of the final permit, once obtained. The Contractor shall ensure that all coordination, permits, notices, reviews and/or approvals are completed with each applicable phase of the design prior to construction starting for that phase. The Contractor shall be responsible for any contract delays resulting from failure to obtain environmental permits, notices, reviews and/or approvals when required.

1.7.1 Applications, Supporting Documents, and Fees

The Contractor shall obtain and complete all environmental permit applications and notices including any documents required for a modification for an existing permit held by the Facility. The Contractor is responsible for preparing all supporting documents, including but not limited to engineering reports, emission surveys, diagrams, pollutant load calculations, etc. If, in lieu of permits, the governing agency requires review and approval of the design, the Contractor shall submit and obtain approval of the design and associated documents. The Contractor shall be responsible for all fees associated with the permits, applications, reviews, approvals, and notices.

1.7.2 Buckley AFB's Environmental Permits, Notices, Reviews, and/or Approvals

The following is a listing of permits, notices, reviews, and/or approvals which may be required for this project. This listing and requirements are not to be considered all-inclusive by the Contractor, but is provided as information to be used in successfully accomplishing the environmental compliances.

   a. In the State of Colorado, EPA has authority for the National Pollutant Discharge Elimination System (NPDES) on Federal Facilities. Construction activities which result in the disturbance of 1 acre of land or more, require coverage under the EPA Storm Water General Permit For Construction Activities (Colorado Permit No. COR10***F). The Contractor shall be the permittee. The Contractor shall be responsible for editing and applying Specification Section 01 41 26.05 24 (FEDERAL FACILITIES COLORADO) NPDES PERMIT REQUIREMENTS FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES.

   b. Municipal Separate Storm Sewer Systems (MS4) Permit. Buckley Air Force Base is under a Municipal Separate Storm Sewer System (MS4) permit, issued by the US Environmental Protection Agency (EPA), which allows discharges of stormwater from Buckley AFB. The MS4 permit also requires Buckley AFB to manage a stormwater program and enforce compliance with EPA-issued permits.

   c. A State of Colorado Air Pollution Emission Notice (APEN) for
Fugitive Dust Permit for Land Development is required, if construction disturbs surface areas of more than 25 contiguous acres or if surface areas of more than 1 acre are to remain disturbed more than six months. The Colorado Department of Public Health and Environment (CDPHE), Division Air Quality issues the permit. The Contractor shall be the permittee and the permit is required prior to any construction starting on the project site. The submittal package to CDPHE shall include a completed Air Pollution Emission Notice (APEN), a Land Disturbance Dust Control Plan, the grading plan, the location plan, and the application fee. The CDPHE requires a minimum of 30 days for review of the package. Prior to issuing the Construction Permit, CDPHE requires the permittee to pay the cost of the review in addition to the application fee.

d. The City of Aurora, Colorado has a review/permit requirement for any new water and sewer lines. The plans and specifications show the location and type of pipes used will need to be forwarded to the city of Aurora prior to installation/construction. The Contractor is to forward these along with any necessary fees for approval prior to installation. The Contractor shall be responsible for coordination with Buckley Air Force Base Environmental Flight Office before submittal to the City of Aurora.

e. Coordination and notification may be required prior to discharge of hydrostatic test water and disinfection water to the sanitary sewer and/or to the surface for land application. The Contractor shall be responsible for coordination with the Environmental Flight, 460 CES/CEV, and the Contracting Officer prior to discharge. The discharge shall be in accordance with all Federal, State, and local laws and regulations.

f. If this project will use materials containing hazardous materials. Material Safety Data Sheets for all chemicals must be available on site at all times. Only ESOH-MIS (formally EMIS) approved chemicals are allowed on Buckley AFB. No hazardous chemicals are allowed to be left on Buckley AFB without prior written approval from the contracting officer or his representative.

g. All work performed on domestic water mains must comply with ANSI/AWWA C651-99 (most current revision). All water main flushing, superchlorination, bacteriological testing and other activities involving the water mains must be coordinated through Bioenvironmental Engineering. Contact the main number at (720) 847-6351.
considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.8.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.8.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
i. The Spill Prevention and Control Plan (SPCC) shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The SPCC supplements the requirements of EM 385-1-1 and the Facility's Haz Mat Plan. The Hazardous Material Emergency Response Plan may be reviewed at the Environmental Flight office. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer and Facility Fire Department in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

j. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

k. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to
participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

1. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

m. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated. Copies of all correspondence, inventories, notifications, etc. to the appropriate Base's Hazardous Material Office and the Contracting Officer shall be included in the plan.

n. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, a copy of the permit and associated documents shall be included as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

o. A historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

p. A pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. The Contractor shall follow
API 32-1053 Sections 3.4.13 and 3.4.14 for data required to be reported to the Installation.

1.8.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

1.9 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor, Contracting Officer, and Base Natural Resources Manager shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection Plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.
PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

The Contractor shall be responsible for obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area. The D/B designer shall develop specifications for relocation/replacing trees and landscaping, and shall submit those specifications in conjunction with his design submittals. All relocated trees and shrubs shall be watered by the contractor for no less than twelve months after relocation, unless an irrigation system is provided.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. Erosion controls are required on all disturbed areas with a slope greater than 1% to prevent erosion/sediment transport prior to establishing vegetation. In addition, erosion controls shall be installed to prevent erosion with concentrated flows along ditch flow lines and outlet points. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not
violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs). BMPs may include, but not be limited to, vegetation cover, silt fences, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Erosion controls selected shall be sufficient to prevent formation of rills and gullies from erosion and the transport of sediment.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Dewatering Operations

Construction operations for dewatering shall be controlled at all times to maintain compliance with existing State water quality standards and designated uses of the surface water body. The Contractor shall comply with the State of Colorado water quality standards and anti-degradation provisions.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal, State, and Buckley air emission and performance laws and standards

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphalt batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Best Management Practices shall be used to minimize fugitive dust. Opacity may not exceed 20% and
measures shall be taken to prevent fugitive dust from migrating off-base. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of Colorado rules.

3.4.4 Burning

Burning shall be prohibited on the Government premises.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. The Contractor shall comply with site procedures pertaining to the use of landfill areas. Coordination with the CEV prior to removing waste off Buckley AFB.

3.5.2 Chemicals and Chemical Wastes

Prior to beginning any process that will use Hazardous Materials (HAZMAT), the user will contact 460 CES/CEV with the amount of material to be used, where excess is to be stored, and the duration of the activity. Additionally, a list of all HAZMAT projected in construction will be supplied to CEV along with manufacturer-specific MSDS Sheets for incorporation into the AF HAZMAT tracking database, AF-EMIS. Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected
in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262 and shall manage and store hazardous waste in accordance with the Installation hazardous waste management plan. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that work is performed.

3.5.5 Waste Water

Disposal of waste water shall be as specified below.

a. Waste water from construction activities, such as on site material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations or by collecting and placing it in a retention pond where suspended material can be settled out and/or the water can evaporate to separate pollutants from the water. The site for the retention pond shall be coordinated and approved with the
Contracting Officer. The residue left in the pond prior to completion of the project shall be removed, tested, and disposed off-Government property in accordance with Federal, State, and local laws and regulations. The area shall be backfilled to the original grade, top-soiled and seeded/sodded.

b. Water generated from dewatering activities shall be land apply on site in accordance with both the Federal and the State of Colorado laws and regulations for land application.

c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing shall be land applied in accordance with all Federal, State, and local laws and regulations for land application or shall be discharged into the sanitary sewer with prior approval and/or notification to the Waste Water Treatment Plant's Operator.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is further encouraged to minimize solid waste generation throughout the duration of the project.

3.7 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The contractor shall divert from the landfill all eligible solid waste during construction and demolition activities. The Air Force goal for solid waste diversion is 50 percent. The goal for solid waste diversion for this project will also be 50 percent by weight. Diversion can be accomplished through recycling, waste to energy incineration, composting, mulching, reuse, and donation. The Contractor shall submit a report to the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

a. Construction and Demolition (C&D) Debris Disposed = in cubic yards or tons, as appropriate.

b. Construction and Demolition (C&D) Debris Recycled = in cubic yards or tons, as appropriate.

c. Total C&D Debris Generated = in cubic yards or tons, as appropriate.

d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) = in cubic yards or tons, as appropriate.

e. Construction and Demolition debris (C&D) composted in cubic yards or tons, as appropriate.

f. Construction and Demolition debris (C&D) mulched in cubic yards or tons, as appropriate.

g. Construction and Demolition debris (C&D) reused in cubic yards or tons, as appropriate.
h. Construction and Demolition debris (C&D) donated in cubic yards or tons, as appropriate.

3.8 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human historical activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.9 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations. The Contractor shall be responsible for identifying and avoiding disturbing the following species and/or their habitat. The Contractor shall not assume that the list is all inclusive. These species have been identified on the Facility but are not at the present time on the project site. The Contractor shall be responsible for ensuring that his employees are able to identify and shall avoid disturbing the species and their habitat. The Contractor shall be responsible for coordinating with the Facility Environmental Flight and the Contracting Officer if Threatened and/or Endangered Species are found on the project site. The State of Colorado's Threatened and Endangered Species list along with descriptions of the species and their habitat may be found at http://wildlife.state.co.us/T&E/list.asp.

3.9.1 Burrowing Owl (Athene cunicularia)

The Burrowing Owl (Athene cunicularia) is a State of Colorado Threatened Species. Burrowing Owls uses prairie dog burrows as a nesting habitat. The burrowing owl may be found on the Facility, especially during the summer months. Unlike the prairie dogs the burrowing owls cannot be relocated and must not be disturbed during nesting (late March through July). Owls start to arrive in late February and remain until the end of October. If construction is starting during this period, a survey must be completed prior to start to ensure no owls are present. If found, construction would have to be delayed until the owl leaves. Construction should start and all potential nesting burrows should be removed before the bird arrives in the spring. Owl surveys can be completed by the Base Natural Resource Manager.

3.9.2 Bald Eagle (Haliaeetus leucocephalus)

The Bald Eagle has been seen but do not nest at this time on the Facility.
The Bald Eagle prey on prairie dogs. The Government recommends avoiding roosting bald eagles by eliminating activity within 75 meters of the roosting bald eagle. However, this is a general recommendation, and may change dependant upon location, available cover, and concealment. It is the Contractor's responsibility to accurately determine appropriate distances to avoid disturbing the Bald Eagle. The Contractor shall ensure that his employees are able to identify bald eagles and shall avoid any disturbance of bald eagles.

3.10 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Pest Management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. For termiticide requirements see Section 31 31 16 SOIL TREATMENT FOR SUBTERRANEAN TERMITE CONTROL. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.10.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.10.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.10.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS) shall be available for all pesticide products.

3.10.4 Application

All pesticide that is applied on Buckley AFB must be reported to the Entomology Shop during the month that it is actually used showing type, quantity, concentration, and location used. Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be
repaired prior to being used.

3.11 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.12 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.13 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.14 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.15 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

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STORM WATER POLLUTION PREVENTION MEASURES

10/04

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PART 1   GENERAL

1.1   REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D 448  (2008) Sizes of Aggregate for Road and Bridge Construction

ASTM D 4873  (2002) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)


1.2   GENERAL

The Contractor shall install and maintain stabilization and structural best management practices which will minimize erosion and sediment pollution from the construction site to the extent attainable. The Contractor shall be responsible for selection of appropriate best management practices as specified herein.

1.3   SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Mill Certificate or Affidavit

1.4   EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below.

1.4.1   Stabilization Practices

The stabilization practices to be implemented may include temporary seeding, mulching, sod stabilization, vegetative buffer strips, erosion control blankets, protection of trees, preservation of mature vegetation,
etc. On his daily CQC Report, the Contractor shall record the dates when the major grading activities occur; when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

1.4.1.1 Permanent Seeding

Disturbed areas of the site where construction activities permanently cease shall be stabilized with permanent seeding no more than 14 days after the construction activity ceases, except as follows. When the initiation of permanent seeding is stopped due to snow cover or arid conditions, permanent seeding shall be initiated as soon as practicable.

1.4.1.2 Temporary Seeding and Mulching

Areas where construction activities will temporarily cease for more than one year shall be temporarily seeded and mulched. Disturbed areas of the site where construction activities temporarily cease for more than 21 days and less than one year shall be stabilized with either temporary seeding and mulching or mulching not more than 14 days after construction activity ceases, except as follows. When the initiation of temporary stabilization measures is stopped due to snow cover or arid conditions, stabilization measures shall be initiated as soon as practicable. Seed mix that is to be used is the short grass prairie mix which can be obtained from the Base Natural Resources Manager. A nurse crop such as oats, or rye is recommended to be sown along with the grass mix to provide quick growth, weed control, and soil stabilization while the grass is getting started. A good soil seed bed will be established prior to seeding using at least 2" of quality top soil or 4" of compost mixed to a depth of 6 inches.

1.4.1.3 Erosion Control Blankets

Erosion control blanket may be installed on steep slopes and in drainage swales and ditches to protect finished grades from erosion.

1.4.2 Temporary Structural Practices

Temporary structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. Temporary structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Temporary structural practices shall include but not be limited to the following devices.

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fence barriers shall be installed along the down slope boundary of all disturbed areas prior to beginning land-disturbing activities in those areas. Silt fence barriers may be installed across ditches or swales but not where the drainage area is greater than 1 acre. Removal of silt fence barriers shall be approved by the Contracting Officer.
1.4.2.2  Storm Drain Inlet Protection

Storm drain inlet protection shall be installed at each new and existing inlet which receives storm runoff from disturbed areas of 1 acre of less. The protection at each inlet shall be removed once the disturbed area has been finally stabilized.

1.4.2.3  Culvert Inlet Protection

Culvert inlet protection shall be installed at all culverts with a drainage area of 1 acre or less.

1.4.2.4  Rock Check Dams

Rock check dams may be used to reduce erosion of temporary or permanent ditches or swales. Type 1 rock check dams shall be used when the upstream drainage area is less than 2 acres. Type 2 rock check dams shall be used when the upstream area is 2 to 10 acres.

1.4.2.5  Stone Construction Entrance

A stone construction entrance shall be constructed wherever traffic will be leaving the construction site and move directly onto a paved road. Stone construction entrances shall be removed after the site has been finally stabilized.

1.4.2.6  Sediment Trap

Sediment traps may be constructed below disturbed areas where the total contributing drainage area is less than 3 acres. Sediment traps, when used, should be constructed prior to disturbance of upslope areas. Sediment traps must have an initial storage volume of 134 cubic yards per acre of drainage area, half of which shall be in the form of a permanent pool or wet storage to provide a stable settling medium. The remaining half shall be in the form of a drawdown or dry storage which will provide extended settling time during less frequent, larger storm events.

1.4.2.7  Diversion Dikes

Diversion dikes may be constructed to divert runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabilized outlet or to divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin. Diversion dikes shall have a maximum channel slope of 2 percent and shall be adequately compacted to prevent failure. The minimum height measured from the top of the dike to the bottom of the channel shall be 18 inches. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the diversion dikes are not damaged by construction operations or traffic.

PART 2  PRODUCTS

2.1  COMPONENTS FOR SILT FENCES

2.1.1  Geotextile

The geotextile shall comply with the requirements of AASHTO M 288 for temporary silt fence.
2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction, shall have a minimum cross section of 2 inches by 2 inches when oak is used and 4 inches by 4 inches when pine is used, and shall have a minimum length of 3 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.1.3 Mill Certificate or Affidavit

A mill certificate or affidavit shall be provided attesting that the geotextile and factory seams meet chemical, physical, and manufacturing requirements specified above. The mill certificate or affidavit shall specify the actual Minimum Average Roll Values and shall identify the fabric supplied by roll identification numbers. The Contractor shall submit a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile.

2.1.4 Identification Storage and Handling

Geotextile shall be identified, stored and handled in accordance with ASTM D 4873.

2.1.5 Support Mesh

Support mesh shall be 14-1/2 gage or heavier steel wire with a mesh spacing of 6 by 6 inch or a prefabricated polymeric mesh of equivalent strength.

2.2 Erosion Control Blankets

Installation staple patterns shall be clearly marked on the erosion control blanket with environmentally safe paint.

2.2.1 Netless Erosion Control Blanket

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd). The blanket shall have a 12-month typical functional longevity and be designed for use on geotechnically stable slopes with gradients up to 1V:4H and channels with shear stresses up to 0.50 pounds per square foot.

2.2.2 Single-Net Erosion Control Blanket

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd) and photodegradable netting on the top side. The blanket shall be sewn together with degradable thread. The blanket shall have a 12-month typical functional longevity and be designed for use on geotechnically stable slopes with gradients up to 1V:3H and channels with shear stresses up to 1.50 pounds per square foot.

2.2.3 Double-Net Erosion Control Blanket

Erosion control blankets shall be a machine-produced mat with a biodegradable agricultural straw matrix (approximately 0.50 lb/sq yd) and photodegradable netting on each side. The blanket shall be sewn together with degradable thread. The blanket shall have a 12-month typical
2.3 COMPONENTS FOR SEDIMENT TRAP

Coarse aggregate shall conform to ASTM D 448, Size 3, 357, or 5. Minor variations from the gradations specified will be permitted. Stone for riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering. The specific gravity of individual stones shall be at least 2.5. Riprap stones shall weigh between 50 and 150 pounds each, except that approximately 10 percent may weigh 50 pounds or less. At least 60 percent shall weight more than 100 pounds. Geotextile shall conform to paragraph GEOTEXTILES.

2.4 COMPONENTS FOR INLET PROTECTION

Aggregates for gravel filter should be sized to get the greatest amount of filtering action possible (by using smaller-sized stone), while not creating significant ponding problems.

2.5 STONE CONSTRUCTION ENTRANCE

Aggregate for construction entrance shall conform to ASTM D 448, Size 1. Minor variations from the gradation specified will be permitted. Geotextile shall conform to paragraph GEOTEXTILES.

2.6 ROCK CHECK DAMS

Coarse aggregate shall conform to ASTM D 448 size number 1 or approved equal. Riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. Riprap shall be hard and angular. The specific gravity of individual stones shall be at least 2.5. Concrete rubble may be used provided it has a density of at least 150 pcf. Individual stones shall have a weight of 50 to 150 lbs except that a maximum of 10 percent of stone may weigh less than 50 lbs. At least 60 percent of stones shall weigh more than 100 lbs.

2.7 GEOTEXTILES

Geotextile for other than silt fence shall comply with the requirements of AASHTO M 288 for a separation geotextile.

PART 3   EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 6 inches wide and 8 inches deep on the upslope side of the location of the silt fence. The 6-inch by 8-inch trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon approval by the Contracting Officer.
3.2 Sediment Trap

The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. Fill material for the embankment shall be placed in accordance with Best Management Practices (BMPs). A geotextile shall be placed between the riprap and subgrade.

3.3 Stone Construction Entrance

The area of the entrance shall be cleared of all vegetation, roots, and other objectionable material. The aggregate layer shall have a minimum total thickness of 6 inches. A geotextile shall be placed beneath aggregate for the full width and length of the entrance. A minimum of 3 inches of the aggregate shall be placed in a cut section to provide stability and secure the geotextile. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, then the tires of the vehicles shall be washed before entering the road. Wash water must be carried away from the entrance to an approved settling area to remove sediment. A wash rack may also be installed for washing of vehicles.

3.4 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.4.1 Silt Fences

Silt fences shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded.

3.4.2 Storm Drain Inlet Protection

Inlet protection structures shall be inspected after each rainfall and repairs made as needed. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design depth.

3.4.3 Rock Check Dams

Check dams should be checked for sediment after each runoff-producing storm event. Sediment should be removed when it reaches one half the original height of the measure.
3.4.4 Stone Construction Entrance

Stone construction entrances shall be maintained in a condition which will prevent tracking or flow of mud onto paved roads. This may require periodic top dressing with additional stone or the washing and reworking of existing stone as conditions demand and repair and/or cleanout of any structures used to trap sediment. The use of water trucks to remove materials dropped, washed, or tracked onto roadways will not be permitted under any circumstances.

3.4.5 Sediment Traps

Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Filter stone shall be regularly checked to ensure that filtration performance is maintained. Stone choked with sediment shall be removed and cleaned or replaced. The structure should be inspected regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the stone outlet should be inspected to ensure that its center is a least 1 foot below the top of the embankment.

3.4.6 Diversion Dikes

Diversion dikes shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged diversion dikes and necessary repairs shall be accomplished promptly. When diversion dikes are no longer required, they shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded.

3.5 INSPECTIONS

3.5.1 General

The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least once every month.

3.5.2 Inspections Details

Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.5.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention measures,
maintenance performed, and actions taken. The report shall be furnished to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily CQC REPORT. -- End of Section --
PART 1 GENERAL

1.1 REFERENCES
1.2 OBJECTIVES
1.3 EPA DESIGNATED ITEMS INCORPORATED IN THE WORK
1.4 EPA PROPOSED ITEMS INCORPORATED IN THE WORK
1.5 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section Table of Contents --
PART 1   GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247

Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. EPA designated products specified in this contract comply with the stated policy and with the EPA guidelines. Make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3 EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Various sections of the specifications contain requirements for materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials. These items, when incorporated into the work under this contract, shall contain at least the specified percentage of recycled or recovered materials unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4 EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.
1.5   EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

PART 2   PRODUCTS

   Not Used

PART 3   EXECUTION

   Not Used

     -- End of Section --
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PART 1 GENERAL

1.1 REFERENCES
1.2 GOVERNMENT POLICY
1.3 MANAGEMENT
1.4 SUBMITTALS
1.5 MEETINGS
1.6 WASTE MANAGEMENT PLAN
1.7 RECORDS
1.8 COLLECTION
   1.8.1 Source Separated Method.
   1.8.2 Co-Mingled Method.
   1.8.3 Other Methods.
1.9 DISPOSAL
   1.9.1 Reuse.
   1.9.2 Recycle.
   1.9.3 Waste.
   1.9.4 Return

PART 2 PRODUCTS

PART 3 EXECUTION

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PART 1    GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. GREEN BUILDING COUNCIL (USGBC)


1.2 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. A minimum of 50 percent by weight of total project solid waste shall be diverted from the landfill.

1.3 MANAGEMENT

Develop and implement a waste management program. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor is responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When
used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Management Plan; G, ; (LEED)

SD-11 Closeout Submittals

Records; (LEED)

1.5 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section 01 45 00.00 10 QUALITY CONTROL. At a minimum, environmental and waste management goals and issues shall be discussed at the following additional meetings:

a. Pre-bid meeting.

b. Preconstruction meeting.

c. Regular QC meetings.

d. Work safety meetings.

1.6 WASTE MANAGEMENT PLAN

A waste management plan shall be submitted within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. The plan shall demonstrate how the project waste diversion goal shall be met and shall include the following:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be held to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.

e. Characterization, including estimated types and quantities, of the waste to be generated.

f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.
g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.

h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Recycling facilities that will be used shall be identified by name, location, and phone number, including a copy of the permit or license for each facility.

i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the Contracting Officer.

j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.

k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

l. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the Contracting Officer.

1.7 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and using the LEED Letter Template. The records shall be made available to the Contracting Officer during construction, and a copy of the records shall be included in the LEED Documentation Notebook.

Demolition accomplished by other parties on this project site count toward the project's total waste diversion cumulative score for LEED. Information on the quantity and disposition of these materials will be provided by the Contracting Officer. Include this data in records, annotated to indicate that it was accomplished by another party.

1.8 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly
and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and recyclable materials shall be handled to prevent contamination of materials from incompatible products and materials. Clean contaminated materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 20.00 10 ENVIRONMENTAL PROTECTION. Separate materials by one of the following methods:

1.8.1 Source Separated Method.

Waste products and materials that are recyclable shall be separated from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

a. Land clearing debris.

b. Asphalt.

c. Concrete and masonry.

d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).
   (1) Ferrous.
   (2) Non-ferrous.

e. Wood (nails and staples allowed).

f. Debris.

g. Glass (colored glass allowed).

h. Paper.
   (1) Bond.
   (2) Newsprint.
   (3) Cardboard and paper packaging materials.

i. Plastic.
   (1) Type 1: Polyethylene Terephthalate (PET, PETE).
   (2) Type 2: High Density Polyethylene (HDPE).
(3) Type 3: Vinyl (Polyvinyl Chloride or PVC).

(4) Type 4: Low Density Polyethylene (LDPE).

(5) Type 5: Polypropylene (PP).

(6) Type 6: Polystyrene (PS).

(7) Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.

j. Gypsum.

k. Non-hazardous paint and paint cans.

l. Carpet.

m. Ceiling tiles.

n. Insulation.

o. Beverage containers.

1.8.2 Co-Mingled Method.

Waste products and recyclable materials shall be placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed.

1.8.3 Other Methods.

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.9 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

1.9.1 Reuse.

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Sale or donation of waste suitable for reuse shall be considered.

1.9.2 Recycle.

Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling. All fluorescent lamps, HID lamps, and mercury-containing thermostats removed from the site shall be recycled. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.
1.9.3 Waste.

Materials with no practical use or economic benefit shall be disposed at a landfill or incinerator.

1.9.4 Return

Set aside and protect misdelivered and substandard products and materials and return to supplier for credit.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --
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PART 1  GENERAL

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1.3 TYPES OF INFORMATION REQUIRED IN CONTROLS O&M DATA PACKAGES

1.4 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES
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   1.4.4 Data Package 4
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SECTION 01 78 23
OPERATION AND MAINTENANCE DATA
07/06

PART 1   GENERAL

1.1 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data specifically applicable to this contract and a complete and concise depiction of the provided equipment, product, or system, stressing and enhancing the importance of system interactions, troubleshooting, and long-term preventative maintenance and operation. The subcontractors shall compile and prepare data and deliver to the Contractor prior to the training of Government personnel. The Contractor shall compile and prepare aggregate O&M data including clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.1.1 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.1.2 Package Content

Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission, except as follows. Commissioned items without a specified data package requirement in the individual technical sections shall use Data Package 3. Commissioned items with a Data Package 1 or 2 requirement shall use instead Data Package 3.

1.1.3 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

1.1.4 Review and Approval

The Contractor's Commissioning Authority (CA) shall review the commissioned systems and equipment submittals for completeness and applicability. The CA shall verify that the systems and equipment provided meet the requirements of the Contract documents and design intent, particularly as they relate to functionality, energy performance, water performance, maintainability, sustainability, system cost, indoor environmental quality, and local environmental impacts. The CA shall communicate deficiencies to the Contracting Officer. Upon a successful review of the corrections, the CA
shall recommend approval and acceptance of these O&M manuals to the Contracting Officer. This work shall be in addition to the normal review procedures for O&M data.

1.1.5 O&M Database

Develop a database from the O&M manuals that contains the information required to start a preventative maintenance program.

1.2 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.2.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.2.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.2.1.2 Operator Prestart

Include procedures required to install, set up, and prepare each system for use.

1.2.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.2.1.4 Normal Operations

Provide narrative description of Normal Operating Procedures. Include Control Diagrams with data to explain operation and control of systems and specific equipment.

1.2.1.5 Emergency Operations

Include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.2.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gage readings.

1.2.1.7 Environmental Conditions

Include a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.
1.2.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.2.2.1 Lubrication Data

Include preventive maintenance lubrication data, in addition to instructions for lubrication provided under paragraph titled "Operator Service Requirements":

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.2.2.2 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

1.2.3 Corrective Maintenance (Repair)

Include manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.2.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.2.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.2.3.3 Maintenance and Repair Procedures

Include instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.
1.2.3.4 Removal and Replacement Instructions

Include step-by-step procedures and a list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

1.2.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.2.4 Corrective Maintenance Work-Hours

Include manufacturer's projection of corrective maintenance work-hours including requirements by type of craft. Corrective maintenance that requires completion or participation of the equipment manufacturer shall be identified and tabulated separately.

1.2.5 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.2.5.1 Product Submittal Data

Provide a copy of all SD-03 Product Data submittals required in the applicable technical sections.

1.2.5.2 Manufacturer's Instructions

Provide a copy of all SD-08 Manufacturer's Instructions submittals required in the applicable technical sections.

1.2.5.3 O&M Submittal Data

Provide a copy of all SD-10 Operation and Maintenance Data submittals required in the applicable technical sections.

1.2.5.4 Parts Identification

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment,
components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog

1.2.5.5 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system.

1.2.5.6 Personnel Training Requirements

Provide information available from the manufacturers that is needed for use in training designated personnel to properly operate and maintain the equipment and systems.

1.2.5.7 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

1.2.5.8 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms.

1.2.5.9 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.3 TYPES OF INFORMATION REQUIRED IN CONTROLS O&M DATA PACKAGES

Include Data Package 5 and the following for control systems:

a. Narrative description on how to perform and apply all functions, features, modes, and other operations, including unoccupied operation, seasonal changeover, manual operation, and alarms. Include detailed technical manual for programming and customizing control loops and algorithms.

b. Full as-built sequence of operations.

c. Copies of all checkout tests and calibrations performed by the Contractor (not Cx tests).

d. Full points list. A listing of rooms shall be provided with the following information for each room:

(1) Floor
(2) Room number
(3) Room name
(4) Air handler unit ID
(5) Reference drawing number
(6) Air terminal unit tag ID
(7) Heating and/or cooling valve tag ID
(8) Minimum cfm
(9) Maximum cfm
e. Full print out of all schedules and set points after testing and acceptance of the system.
f. Full as-built print out of software program.
g. Electronic copy on disk or CD of the entire program for this facility.
h. Marking of all system sensors and thermostats on the as-built floor plan and mechanical drawings with their control system designations.

1.4 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES
Furnish the O&M data packages specified in individual technical sections. The required information for each O&M data package is as follows:

1.4.1 Data Package 1
a. Safety precautions
b. Cleaning recommendations
c. Maintenance and repair procedures
d. Warranty information
e. Contractor information
f. Spare parts and supply list

1.4.2 Data Package 2
a. Safety precautions
b. Normal operations
c. Environmental conditions
d. Lubrication data
e. Preventive maintenance plan and schedule
f. Cleaning recommendations
g. Maintenance and repair procedures
h. Removal and replacement instructions
i. Spare parts and supply list
j. Parts identification
k. Warranty information
l. Contractor information

1.4.3 Data Package 3

a. Safety precautions
b. Operator prestart
c. Startup, shutdown, and post-shutdown procedures
d. Normal operations
e. Emergency operations
f. Environmental conditions
g. Lubrication data
h. Preventive maintenance plan and schedule
i. Cleaning recommendations
j. Troubleshooting guides and diagnostic techniques
k. Wiring diagrams and control diagrams
l. Maintenance and repair procedures
m. Removal and replacement instructions
n. Spare parts and supply list
o. Product submittal data
p. O&M submittal data
q. Parts identification
r. Warranty information
s. Testing equipment and special tool information
t. Testing and performance data
u. Contractor information

1.4.4 Data Package 4

a. Safety precautions
b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Lubrication data

i. Preventive maintenance plan and schedule

j. Cleaning recommendations

k. Troubleshooting guides and diagnostic techniques

l. Wiring diagrams and control diagrams

m. Maintenance and repair procedures

n. Removal and replacement instructions

o. Spare parts and supply list

p. Corrective maintenance man-hours

q. Product submittal data

r. O&M submittal data

s. Parts identification

t. Warranty information

u. Personnel training requirements

v. Testing equipment and special tool information

w. Testing and performance data

x. Contractor information

1.4.5 Data Package 5

a. Safety precautions

b. Operator prestart

c. Start-up, shutdown, and post-shutdown procedures

d. Normal operations

e. Environmental conditions
f. Preventive maintenance plan and schedule


g. Troubleshooting guides and diagnostic techniques


h. Wiring and control diagrams


i. Maintenance and repair procedures


j. Removal and replacement instructions


k. Spare parts and supply list


l. Product submittal data


m. Manufacturer's instructions


n. O&M submittal data


o. Parts identification


p. Testing equipment and special tool information


q. Warranty information


r. Testing and performance data


s. Contractor information


PART 2  PRODUCTS

Not Used


PART 3  EXECUTION

Not Used


-- End of Section --
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Air Force Minimum BIM Requirements v2.1

Air Force BIM PxP Template

Minimum Modeling Matrix (M3) Instructions and Requirements

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1.1 DEFINITIONS

"Building Information Model" (BIM) or "Model" is a parametric, computable representation of the project design developed by the Air Force's design professional consultants ("Designers"), and construction details developed by the Contractor and its subcontractors that are integrated into the model. As used in this BIM Specification, references to Building Information Model, BIM, or the Model, include the primary design model or models and all linked, related, affiliated or subsidiary models developed for design, analysis, estimating, detailing, fabrication, construction, operation or maintenance of the project, or any portion or element of the project.

The BIM Model developed for the RFP will be provided to the Contractor at the Pre-construction conference for the designer's optional use. The model developed for the RFP is a Revit version 2015 concept model and was not developed or coordinated in compliance with the design requirements listed herein. Use of the concept model shall not limit compliance with BIM requirements in this contract for subsequent design and record BIM model submittals.

1.2 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

Pre-Award Submittals

Proposal BIM Execution Plan

SD-01 Post Award

Final BIM Execution Plan (BEP); G, DO
BIM Architectural Design Phase (60% Design Submittal); G, DO
BIM Horizontal Coordinated Design Phase (100% Unreviewed Design Submittal); G, DO
BIM Construction Documents Phase (100% Reviewed Design Submittal); G, DO

SD-11 Closeout Submittals

Record BIM; G, DO
1.2.1 BIM Execution

1.2.1.1 Proposal BIM Execution Plan

The proposal must include a draft BIM Project Execution Plan addressing the Execution/Implementation evaluation criteria as described in Section 00 22 00 PROPOSAL SUBMISSION REQUIREMENTS, EVALUATION CRITERIA AND BASIS OF AWARD.

1.2.1.2 Final BIM Execution Plan

Prior to the Design Kickoff Meeting, submit the fully completed Execution Plan developed during the selection process for review and acceptance by the USACE Omaha District BIM Manager or delegate. Use the provided template available online at http://www.wbdg.org/references/afbim_tools.php. The purpose is to document the viability of the BIM design, production, coordination, construction, and documentation.

The BIM Execution Plan shall identify how the BIM data shall be managed and interoperate (data storage, sharing, viewing, quality control parameters in Section 2.3 Quality Control, and updating, as necessary) among all Contractor team members.

1.2.1.3 BIM Execution Plan Demonstration

Conduct a BIM Execution Plan demonstration at the Design Kickoff meeting to review the Execution Plan for clarification, and to verify the functionality of Model technology workflow and processes. The demonstration may include content from the proposed project design, a recent project or a simulated project. The USACE Omaha District BIM Manager or delegate shall confirm acceptability of the Plan or propose additional processes or activities necessary to be incorporated into the Plan. If modifications are required, the Contractor shall execute the modifications and resubmit the final Implementation Plan for USACE Omaha District BIM Manager or delegate acceptance. At the determination of the Contracting office, there will be no payment for design or construction until the Plan is acceptable to the USACE Omaha District BIM Manager or delegate. ;Design over the shoulder reviews shall be conducted at design review meetings at Buckley AFB. Contractor shall provide live demonstrations of the BIM at each design review meeting.

1.2.1.4 BIM Model Demonstrations

Conduct a live demonstration of the project BIM deliverables at each design review conference. Each demonstration shall illustrate the level of development of the BIM model commensurate with the level of development of the project and required by the BIM Project Execution Plan and the requirements described in this specification.

1.2.2 Design Submittal Requirements

1.2.2.1 Submittal Requirements

Unless stated otherwise, the BIM submittals will be reviewed by the USACE Omaha District BIM Manager or delegate for acceptance. During the Design Submittal stages, the Contractor shall deliver the design documentation with information derived from the Model.
1.2.2.2 Compliance

Provide submittals in compliance with Execution Plan Plan deliverables at stages as described hereinafter.

1.2.2.3 Reports

Provide a Contractor-certified written report with each design submittal, confirming that consistency checks as identified in Paragraphs 2.3 and 2.4 have been completed for the design submittal. This report shall be discussed as part of the design review conference and shall address cross-discipline interferences, if any.

1.2.2.4 Model Data

For each Design Submittal, perform a review of the development of the Model components and Facility Data via a 3-D interactive visualization demonstration from the Model to the Buckley AFB, USACE and BCE personnel using data format of choice and submit a copy of 3-D interactive visualization file to the USACE Omaha District BIM Manager or delegate. Possible submittal format options include: NavisWorks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ or equivalent format. The Government may request other formats if needed to address Project-specific requirements.

1.2.3 Design Submittal

1.2.3.1 BIM Architectural Design Phase (60% Design Submittal)

Demonstrate 60% development of the Model components and Facility Data identified in Paragraph “Model Components”. Review the Model with the Government for conformity to program, massing, circulation, fire protection, security and sustainability requirements. Provide the Model, Facility and CAD Data files in native and interoperable formats per Implementation Plan requirements, and any rendering files, on DVD/CD-ROM.

1.2.3.2 BIM Horizontal Coordinate Design Phase (100% Unreviewed Design Submittal)

Demonstrate 95% development of the Model components and Facility Data identified in Paragraph “Model Components”. The Model shall include architectural, interior design, structural, mechanical, electrical, plumbing and fire protection systems and Facility Data, as applicable to the 95% Design Submittal. Provide the Model, Facility and CAD Data Files in native and interoperable formats per the Execution Plan requirements, and any rendering files using on DVD/CD-ROM.

1.2.3.3 BIM Construction Documents Phase (100% Reviewed Design Submittal)

Demonstrate 100% development of the Model components and Facility Data identified in Paragraph “Model Components”. The Model shall include all design elements identified in the U.S AIR FORCE BUILDING INFORMATION MODELING MINIMUM REQUIREMENTS VERSION 2.1, unless otherwise agreed by the Government. Secure acceptance of the Model from the Government before proceeding with commencement of construction. Provide the updated Model, Facility and CAD Data Files in native and interoperable formats per the Implementation Plan requirements, and any rendering files on DVD/CD-ROM.
1.3 QUALITY CONTROL

1.3.1 BIM Competence and Responsibilities

The Contractor shall provide a detailed written description of the BIM experience of its key project team members. At a minimum, the key project team members include the construction project manager, the construction cost estimator, scheduling engineer, construction project engineer, and construction superintendent. In addition, the Contractor must designate a BIM Manager to oversee the technical aspects of developing, managing and maintaining the BIM model. The Contractor's description must describe the BIM experience and responsibilities of these key personnel on at least three prior projects that are similar to the current project in size and complexity. The description must also describe how their prior BIM experience relates to specific BIM deliverables and tasks within the Contractor's scope of work or proposal.

1.3.2 Model Checking

At each stage provide a Contractor-certified written report with each design submittal, confirming that all consistency checks as identified in Section G: Quality Control of the U.S. AIR FORCE BUILDING INFORMATION MODELING MINIMUM REQUIREMENTS have been completed for the design submittal. This report shall be discussed as part of the design review conference and shall address cross-discipline interferences.

1.4 DATA OWNERSHIP AND REUSE

The Government owns the BIM, the data contained within it, and all copyrights to the BIM. The Contractor must arrange by contract to have the ownership and copyright to those portions of the BIM created by the Contractor and its subcontractor's assigned to the Government.

1.5 RELATIONSHIP OF BIM REQUIREMENTS TO OTHER REQUIREMENTS

The Contractor's use and development of the BIM must satisfy the requirements of this BIM Specification, and any additional requirements noted in the Contract. To the greatest extent practicable, the BIM should describe the project as it will be constructed, with the exception of elements that can not be practicably modeled because of software limitations or that are smaller than elements normally modeled on similar projects. All limitations to the extent of modeling must be identified in the BIM Execution Plan and agreed in writing by the Contracting Officer. Those project elements that are not modeled must be constructed in accordance with supplementary design information prepared by the Contractor that has been fully coordinated with the modeled information.

1.6 MODEL COMMUNICATION AND ACCESSIBILITY

1.6.1 Security

The BIM, including two-dimensional drawings generated from the BIM, and including draft and related information, will constitute For Official Use Only (FOUO) material as defined by AR 380-5, Department of the Army Information Security Program. The Contractor is responsible for maintaining the security of the BIM, including access to the BIM, in accordance with Air Force regulations and guidelines. The obligation to keep the BIM secure continues throughout performance of this contract and survives termination. At the conclusion of the project, the BIM and all
draft or related information must be given to the Contracting Officer and any copies destroyed in a manner appropriate for the security classification applicable to the information and as required by regulations.

1.6.2 Government Interaction

The Contractor must maintain and administer the BIM and associated files and provide secure access to Government personnel and Government contractors as designated by the Contracting Officer. The Government's right to review, and review of the BIM is for Government's convenience, alone, and does not create any duty for the Government to review the BIM or to take any action upon reviewing the BIM, nor does it relieve the Contractor of any of its responsibility for complying with the terms of its contract, including its responsibility to properly construct the project.

1.6.2.1 Commissioning

The Contractor shall provide the Government's designated commissioning authority with access to the BIM and associated files. The Contractor must coordinate with the commissioning authority the integration of model view definitions into the BIM.

1.6.2.2 Facility Management

The Contractor shall provide the Government's designated facility managers with access to the BIM and associated files. The Contractor must coordinate with the facility managers the integration of model view definitions and the format and content of the Record BIM.

1.6.2.3 Reviews

The Contractor shall provide the Contracting Officer and Government designated reviewers with access to the BIM and associated files. The Contractor must coordinate with the Contracting Officer and reviewers the use of the BIM for defined the Air Force reviews. The Contractor shall coordinate with the Government reviewers to schedule and conduct periodic over-the-shoulder BIM model reviews at the Contractor's construction trailer.

1.6.2.4 Export Information

The Contractor shall provide the Government with access to the BIM and associated files for exporting information. The Government reserves the right to utilize information exported from the BIM at any time during the contract.

PART 2 PRODUCTS

2.1 Model Components

The Model shall include the following, subject to Government concurrence:

2.1.1 Project Specific BIM Facility Data

Develop the Facility Data, consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions, qualities, and attributes that are necessary for the Project facility design.
2.1.2 Project Specific Minimum Requirements

The Contractor’s Model shall include, at a minimum, the requirements U.S. AIR FORCE BUILDING INFORMATION MODELING MINIMUM REQUIREMENTS VERSION 2.1. The USACE Omaha District BIM Manager or delegate must agree with any proposed modifications to minimum requirements before incorporation into the Model.

2.1.3 Facility Data Output

Each submittal shall include a list of Construction Documents (e.g., drawings, elevations, design sections and schedules, details) that shall be produced from the Facility Data and updated as necessary.

2.1.4 Model Granularity

Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4” = 1’0”) scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings. Refer to U.S. AIR FORCE BUILDING INFORMATION MODELING MINIMUM REQUIREMENTS VERSION 2.1.

PART 3 EXECUTION

3.1 CLASH DETECTION AND CONFLICT RESOLUTION

3.1.1 Clash Identification and Resolution Period

The Contractor must conduct and manage an adequate and thorough Clash Detection process before commencing construction so that interferences between building components will be detected and resolved before fabrication and installation. The Contractor is solely responsible for the cost of remedying any clashes that could have been discovered during this Clash Detection process. Before commencing construction, and as indicated in any shop drawing or submittal schedule, the Contractor must prepare or obtain all shop information, fabrication information, or layout information (Submittals) necessary to clash detect the Submittals against each other and against the Contract Documents. If the Submittals are not in an interoperable 3D modeled format, the Contractor must model the Submittal information to allow digital clash detection.

3.1.2 General

The Contractor's BIM Manager must assemble a composite model from all of the model parts for the purpose of performing a visual check of the building design for spatial and system coordination.

The clash detection process should uncover and address hard clashes between modeled elements and soft clashes, such as infringements into code or maintenance required clearances and necessary clearances for fireproofing, insulation or other non-modeled elements. Prior to each scheduled coordination meeting, an updated clash report must be issued by the BIM Manager to technical and engineering subcontractors.

The Contractor must use coordination software for assembling the various construction models to electronically identify, collectively coordinate resolutions, and track and publish interference reports between all disciplines. The Contractor must be responsible for updating their models to reflect the coordinated resolution.
The Contractor must review the model and the clash reports in coordination meetings as required by the BEP, until all spatial and system coordination issues have been resolved. The clash report must be integrated and overlayed within the BIM.

Internal Clash Resolution: The Contractor must verify that the Subcontractors responsible for multiple scopes of work are coordinating the clashes between those scopes prior to providing those models to the Contractor's BIM Information Manager for spatial and system coordination.

Spatial Coordination Verification: The Contractor to maintain verification and tracking of resolved conflicts of all discipline coordination issues.

3.1.3 Minimum Requirements for Spatial Coordination and Clash Detection

Architecture + Structural: Below-grade spaces, proposed floor plates with major penetrations, floor-to-floor heights, beam clearances, heavy utilities locations, floor loads, core, and vertical shafts, beam depths and required clearances, slab thickness, columns, column caps, and structural bracing including seismic. Provide adequate space for construction and maintenance access to structural elements, building equipment, and distribution systems.

MEPF (internal): Clash detection for MEPF elements.

Architecture + MEPF: Structural and space elements, flow and isolation requirements, proposed functional area configurations, floor-to-floor heights, fire containment, vertical and horizontal transportation.

MEPF/HVAC + Architecture, Structure, and Telecommunications: Main distribution and collection systems, configurations and sizes for piping, duct, conduit, power wiring, blowers; diffusers; intakes, large compressors, hangers. Clearance reservations for equipment maintenance filter removal, and equipment removal and replacement must be modeled with the equipment.

Vertical shafts will be reviewed to ensure that adequate space has been allocated for all of the vertical mechanical systems. All of the shafts are to line up floor to floor.

Architecture + Life Safety Fire Protection: Safe zone and fire suppression pipe and hanger location, egress paths and exit distance requirements, equipment, and pipe penetrations.

Architecture/HVAC + Interiors: Merges must include ductwork and piping + ceilings and FF&E + HVAC.

Space Validation: There must be no space gaps. Bounding boxes, designated enclosed floor areas, used to represent room and zone spaces must match with architectural requirements and data values, and all must be coordinated with values given in the program and engineering requirements.

General Model Quality Checking: All walls must be properly joined to prevent "space leaks" in areas defined by enclosing walls. Bounding boxes must not conflict.

Accessibility Compliance: Wheelchair pathways and clearances + structure + MEPF components. These components must include plumbing fixtures. (If
using Solibri Model Checker or other rules-based model checking software, accessibility compliance can be checked automatically.)

3.1.4 Record BIM

The BIM must be updated continuously throughout the construction process and must include all addenda, approved change orders, field orders, clarifications, Request for Information (RFI) responses and as-built conditions. The Record BIM includes the BIM at a Level of Development consistent with the latest version of the USACE Minimum Modeling Matrix (M3) and includes a description of the relationship of each model in the Record BIM to the others. The Contractor shall use the USACE Minimum Modeling Matrix (M3) Template located at https://cadbimcenter.erdc.dren.mil/ (under BIM Contract Requirements). In addition, the Record BIM must be accompanied by the final versions of all fabrication and detailing models prepared by the Contractor and its subcontractors. All models must be provided in native file format with a description of the software used to create the model (software manufacturer, software name, version number, and operating system used for the software).

3.1.5 BIM Execution Plan (BEP)

No later than 30 days after NTP, the Contractor must prepare a Final BIM Execution Plan (BEP) confirming the intended uses of the BIM during the design and construction phases of the project, describing the communication paths, and the model structure. The BEP must be provided to the Government for its review and approval. Once approved, the BEP cannot be modified without the Contracting Officer's written approval.

The BEP must, at a minimum, contain the following elements.

3.1.5.1 BIM Staffing Plan

The Contractor must identify for itself and each of its subcontractors and consultants, the persons that within their organizations responsible for managing the BIM, or portion of the BIM. Where an organization is responsible for multiple disciplines, or where the project is divided into sections or phases, the BIM Staffing Plan should include the persons responsible for the discipline, section or phase. For each person identified, the BIM Staffing Plan should include the person's:

- Name;
- Title;
- Contact Information (location, primary phone number, mobile phone number, and email address);
- Description of the duration and extent of the person's experience with the BIM software the Contractor proposes to use;
- Identification and description of prior projects where the person used BIM software and the extent it was used on that project;
- Role; and
- Anticipated time devoted to the project in hours per week. If the level of activity will vary throughout the project, the staffing plan should be delivered as a schedule. This may be depicted on a monthly schedule basis where the level of activity will vary during the project.

3.1.5.2 Security Plan

The Contractor must prepare a Security Plan that describes the procedures
and safeguards used to preserve the confidentiality and integrity of the BIM and to demonstrate compliance with the Air Force requirements for data security and integrity.

3.1.5.3 Minimum Modeling Matrix (M3)

The BEP must contain a Minimum Modeling Matrix (M3). The M3, in spreadsheet format, is a tool to be used by the Contractor to document and communicate the scope of modeled content within the BIM deliverables, and to the Contractor and all applicable Subcontractors organize the content by using common classification systems such as Omniclass, Uniformat, and Masterformat. Additional information as well as the M3 Template can be found at https://cadbim.usace.army.mil (under BIM Contract Requirements).

3.1.5.4 BIM Process Design

The Contractor must lead a workshop that includes the Contractor's staff, the Contractor's subcontractors, and Government staff. The purpose of the workshop is to develop process diagrams documenting BIM information exchange and BIM workflow. At a minimum, the process mapping should include a process map of the overall BIM processes and individual detailed maps documenting the information and workflow applicable to specific BIM uses. At the conclusion of the workshop, the Contractor must prepare the process overview and detailed BIM process maps and distribute them to the workshop participants. Examples of the BIM process design maps and supporting worksheets are contained in the BIM Project Execution Planning Guide, published by the Penn State Computer Integrated Construction Research Program.

3.1.5.5 Schedule

The Contractor must prepare a schedule for BIM deliverables tied to the Minimum Modeling Matrix (M3). The schedule must include all BIM tasks of the Contractor's subcontractors, the schedule of clash detection and resolution meetings, and appropriate review time by the Government that will comment or render decisions regarding the project construction. The schedule must be submitted to the Government for review as directed by the contract documents.

3.1.5.6 Model Structure

3.1.5.6.1 File Naming Structure

File names for models should be formatted as discipline-project number-building number.file extension. (Example: COORD-1111-BL001.rvt) File name prefixes by discipline are listed in the table below:

<table>
<thead>
<tr>
<th>Model</th>
<th>Designator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Model</td>
<td>ENERGY-</td>
</tr>
<tr>
<td>Coordination Model</td>
<td>COORD-</td>
</tr>
<tr>
<td>Construction Model</td>
<td>CONST-</td>
</tr>
<tr>
<td>Other Model Types as Required</td>
<td></td>
</tr>
</tbody>
</table>
3.1.5.6.2 Model Structure and Division of Modeled Information

In most instances, the BIM will consist of a series of related models that depict information relevant to specific disciplines or uses. Moreover, a specific discipline model or use model may be organized into separate floors, sections, divisions or files. The BEP must describe the organization of the model files, explaining how each file and model is separated, the file naming conventions that will be used for each file type, the relationship of files to each other, and the process that the Contractor shall use to ensure that all of the models remain current and consistent.

3.1.5.6.3 Measurement and Coordinate Systems

The measurement and coordinate systems are to be confirmed and documented in the BEP for this project. The Contractor must provide the following:

All measurements must be in units of measurement required by standards applicable to the Government agency. Site plans and building models must be geo-referenced to, North American Datum 1983 (NAD83)(2007) and the North American Vertical Datum of 1988 Ellipsoid (GRS80).

3.1.5.7 Software and Operating Systems

The BEP must list the BIM software and computer operating system or systems to be used by the Contractor and its subcontractors for this project. The software and operating systems should be identified by vendor, product name, version identifier, build identifier, patch number, and data architecture (32bit/64bit). Listed software, and listed operating systems, can not be changed or upgraded without the Contracting Officer's written approval, which will not be granted unless the Contractor demonstrates that the change or upgrade will not affect the ability to use existing BIM information or to reliably and accurately exchange BIM information with other listed software.

3.1.5.8 Electronic Communication Procedures

3.1.5.8.1 File Access and Archiving

The BEP shall specify:

- The physical and logical locations of BIM files and related electronic information;
- The protocols for archiving and disaster recovery;
- The protocols for user access and file permissions;
- The directory/subdirectory/file structure used to organize the BIM files and related electronic information;
- The internet address and directory structure for a secure web site, internet accessible project manager, or web portal used to store and access BIM files; and
- Maintenance of BIM as-built information during construction.
3.1.5.8.2 Electronic File Formats and Use

The BEP shall specify:

- The types of digital information that will be transmitted between project participants;
- The acceptable methods of transmission; and
- The acceptable file format(s) to be used for the type of digital information.

3.1.5.8.3 Contractor Information Manager(s)

The BEP shall identify and provide contact information for the persons responsible for managing and executing the responsibilities of this section.

3.1.5.9 Site Survey Modeling

If the Contractor's scope of services includes surveying the existing project site and preparing a model of the existing facilities, the BEP must include the following:

- Description of tasks and schedule for developing the site survey model;
- Description of recommended methodology for developing the existing site information, such as:
  - Development of model based on as-built documents for facility;
  - Optical surveying facility to develop a new model or validate the accuracy of existing information used to create a model;
  - Laser scanning all or a portion of the facility to develop new model or validate the accuracy of existing information used to create a model;
  - or Combination of tasks or approaches to accomplish the goals.

When laser scanning is required or shall be used by the Contractor, the BEP should identify:

- Primary and secondary objectives of laser scanning;
- Areas of Interest;
- Resolution requirements and measurement units;
- Type of deliverable;
- Control network or other dimensional control; and
- Quality control procedures.

The Contractor shall reference the GSA BIM Guide Series 03, BIM Guide For 3D Imaging in developing this portion of the BEP.
3.1.5.10 Change Management

The BEP should specify the process for integrating submittals, contract modifications, RFI responses, clarifications and similar construction phase information into the BIM. The process should describe:

- Who is authorized to integrate the construction level information into the BIM;
- How construction level information will be coordinated and clash detected with the existing BIM information;
- How changes to the BIM will be logged; and
- How construction level information will be identified to distinguish it from Design BIM information.

3.1.5.11 Construction Management

The BEP shall outline the strategy and schedule for utilizing BIM Technology to execute construction related activities and project coordination. The BEP shall address the following:

- Constructibility analysis with BIM
- Animation/graphic showing installed major building equipment space clearance reservations for operations, repair, maintenance, and replacement
- Updating as-built conditions in Record BIM
- Proposed BIM Software to be used by the builder and fabrication modelers
- Strategy to assure all trade information is modeled and coordinated
- Proposed subcontractor BIM workshops and training integrated into project schedule

3.1.6 Interoperability

The Contractor is responsible for selecting BIM software that is adequate for the Contractor's tasks. Moreover, the Contractor must demonstrate that the software used by it and its subcontractors can exchange BIM information reliably and accurately and can read and export BIM information into open source file formats to the extent required in Section 3.1.10.5.2. The Government's listing of BIM software is not a recommendation that any specific product or products be used, nor is it a representation or warranty as to the adequacy of the software product or of its ability to exchange BIM information reliably and accurately. The Contractor must demonstrate, through the technical specification of the software, that it can meet the required functional requirements, whether or not the proposed software is listed below.

3.1.6.1 BIM Software

BIM software for the project must support intelligent objects and parametric relationships. The software must comply with current industry interoperability standards and be usable in a collaborative environment.
All software platforms used for the project must be compliant with:

- The most current version of Industry Foundation Classes (IFC) file format; and
- Commercially available collaboration software that provides interoperability between the different software applications (see below).

Additional software not listed below may be found on the BuildingSMART Alliance web site, http://www.buildingsmartalliance.org/.

<table>
<thead>
<tr>
<th>TYPE (These are general categories. Listed software can be used for more than one &quot;Type&quot;)</th>
<th>SOFTWARE (no order of preference)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning/Preliminary Cost Estimates</td>
<td>Onuma Planning System (OPS), DProfiler, Tokmo, CodeBook</td>
</tr>
<tr>
<td>Authoring - Design (Architecture, Structural)</td>
<td>Revit Architecture, Revit Structure, Bentley BIM, ArchiCAD, Tekla, Vectorworks</td>
</tr>
<tr>
<td>Authoring - MEPF (Engineering &amp; Construction)</td>
<td>ArchiCAD MEP, Revit MEP, Bentley BIM, CAD- Duct, CAD- Pipe, AutoSprink, PipeDesigner 3D</td>
</tr>
<tr>
<td>Authoring - Civil</td>
<td>Bentley Inroads and Geopak, Autodesk Civil 3D</td>
</tr>
<tr>
<td>Coordination (clash detection)</td>
<td>NavisWorks Manage, Bentley Navigator, Solibri Model Checker, Horizontal Glue, EPM Model Server, BIMServer</td>
</tr>
<tr>
<td>4D Scheduling</td>
<td>Synchro, Vico, NavisWorks Simulate, Primavera, MS Project, Bentley Navigator</td>
</tr>
<tr>
<td>5D Cost Estimating</td>
<td>Innovaya, Vico, Tokmo</td>
</tr>
<tr>
<td>Model Checking Validation, IFC File Optimizer</td>
<td>Solibri</td>
</tr>
<tr>
<td>Construction Operations Building Information Exchange (COBie2)</td>
<td>Tokmo</td>
</tr>
<tr>
<td>3D CMMS/BAS Integration Software</td>
<td>EcoDomus</td>
</tr>
</tbody>
</table>
3.1.6.2 Open Source File Formats/Open Standards

3.1.6.2.1 Statement of Principal

To ensure the life-cycle use of building information, the Government requires that information supporting common industry deliverables be provided in existing open standards, where available. For those contract deliverables whose open standard formats have not yet been finalized, the deliverable must be provided in a mutually agreed upon format that allows the re-use of building information outside the context of the proprietary BIM software. The formats used shall be specified in the BIM Execution Plan and must include, at a minimum, the following standards:

3.1.6.2.2 Current Version IFC Model View Definition (MVD) Formats

Coordination: This format will be required for all deliverables needed to demonstrate the coordination of all disciplines prior to construction. In addition to the Coordination View file(s), where required, the Contractor shall provide a report highlighting automatically detected (hard and soft) collisions and identifying those collisions that require further work by the Contractor.

3.1.6.2.3 Portable Document Format

Non-modeled information authored directly by the Contractor must be transformed to PDF to allow searching for and selection of text within the document. Documents authored by others, but used by the Contractor such as manufacturer product data sheets, must be provided the format made available by the manufacturer or scanned as image-based PDF documents.

3.1.6.2.4 GBxml

At a minimum, Architectural, Mechanical and Electrical BIM software must support accurate and reliable data export to GBxml for environmental analysis, optimization, and sustainability classifications, such as LEED, Green Globes and EnergyStar.

3.1.6.3 Requirements

The Contractor must create a Record Building Information Model in accordance with the USACE M3 requirements that accurately reflects "as-built" conditions for all building systems including but not limited to, architectural, structural, mechanical, plumbing, life safety, electrical, and telecommunications systems.

3.1.6.4 Modeling Requirements

3.1.6.4.1 General

Model objects must contain IFC parameters and associated data applicable to building system requirements. These elements must support the analytic process include size, material, location, mounting heights, and system information where applicable. As an example, a light fixture may contain
several parameters such as energy output requirements, user illumination levels, make, model, manufacturer, and bulb life. Elements, objects and equipment must be tagged with unique identifiers (GUIDs).

3.1.6.4.2 Types of Model Elements

Model elements must be derived from the following sources:

Manufacturer's Model Elements - elements created by and acquired from manufacturers often have more information than is prudent to keep in the BIM model; the appropriate level of detail should be retained for the design element. However, embedded performance data must remain for analysis and specification purposes.

Custom Created Model Elements - custom model elements that are created must utilize appropriate BIM Authoring tool templates to create custom elements. Custom models elements need to be assigned as a part of a family or group with parametric model view definition information.

Fabrication Model Elements - elements created by the construction sub-contract fabricators must have embedded model view definition information required by the commissioning authority for transfer from the BIM to the facility management software. The fabrication model elements must be parametric model objects.

3.1.6.4.3 Model Geographical Location

As is standard practice, the Government requires that a building within a BIM file include a geo-reference to accurately locate that building within the site and to give it a physical location context at larger scales. The Contractor Information Manager will geo-reference site plans and building models for site layout surveying and future GIS use in accordance with the State Plane Coordinate system where the project is located. The BIM file point must be located at the SW corner of the structural grid.

3.1.6.4.4 Space Naming and Coding

The Contractor's space naming and coding must use the following format:

- Building Name;
- Building Number - using Buckley AFB numbering scheme;
- Floor (and/or Level);
- Department;
- Sub-department;
- Space Name - English Name & Abbreviation;
- Room Number - Buckley AFB Wayfinding Room Number;
- Room Number - Construction Document Number (used on large complex projects for builder use);
- Space Code - Buckley AFB Room Code;
- Unique Space Number - GUID;
3.1.6.4.5 Contractor BIM Deliverables

3.1.6.4.5.1 Models

The Contractor must ensure that the models remain current throughout construction of the project. During construction the Contractor shall be responsible for providing a fully coordinated and assembled model compatible with the original software authoring that is consistent with the:

- Native file format(s) of Models (version as agreed in BIM Execution Plan);
- Exported 2D CAD sheet files from native Models (AutoCAD, version 2013 compatible);
- IFC file format (version as agreed in BIM Execution Plan); and
- Collaboration software format (Navisworks Manage or equal or (version as agreed in BIM Execution Plan) for fully coordinated and assembled BIM.

The Contractor must provide record model(s) for all building systems. The model(s) must be fully coordinated and the required instructions on file/folder setup must also be included:

- Native file formats of the final consolidated record model(s) for building systems used in the multi-discipline coordination process (version as agreed in BIM Management Plan); and
- Exported 2D CAD sheet files from native Models (AutoCAD, version 2013 compatible);
- IFC file format of the consolidated building systems models (version as agreed in BIM Management Plan).

3.1.6.4.5.2 Data Deliverables

The Contractor must provide facility management data, model view definitions, in COBie2 format.

3.1.6.4.5.3 2D Deliverables

Contractor's 2D deliverables must be provide in:

- In PDF format with fully bookmarked pages, where not prepared or maintained in CAD formats; or
- DWG format meeting the Air Force requirements.
- All 2D drawings must comply with the graphic standards as
referenced in the A/E/C (Architectural, Engineering, and Construction) CAD Standard - Release 6.0. When 2D deliverables are exported from BIM, files shall comply with said standard to the greatest extent practical.

For portions designed by the Contractor that will be reviewed by inspection or permitting agencies, the Contractor must produce printed drawings from the model, signed and sealed by licensed professional architects and engineers, as required by the reviewing or permitting agency.

3.1.6.4.5.4 Digital Deliverables

All digital deliverables are to be submitted on either disk space (DVD) or portal hard drive media. The data clearly organized and software version(s) labeled. DVD's are preferred; however, if the data is too large for a single "disk", then use a portable hard drive.

3.1.7 Waivers of Specific Requirements

If a requirement contained in this document can not be achieved, or can not be achieved at a cost commensurate with the value of the requirement, the Contractor may request, in writing, that the requirement be withdrawn or modified. The request must certify that the Contractor has diligently attempted to meet the requirement, that the requirement can not reasonably be met, and that alternative approaches meet the intent of the requirement. The request must be supported by evidence of the Contractor's research and documentation that the alternative approach meets the function and interoperability requirements of this document. The Government, in its sole discretion, may waive requirements found to be currently unachievable or not commercially practicable. All waiver requests must be in writing and signed by the Contracting Officer.

3.1.8 Abbreviation List

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
</tr>
<tr>
<td>BEP</td>
<td>BIM Execution Plan</td>
</tr>
<tr>
<td>BIM</td>
<td>Building Information Model (also Modeling or Management)</td>
</tr>
<tr>
<td>COBie2</td>
<td>Construction Operation Building Information Exchange</td>
</tr>
<tr>
<td>DBIM</td>
<td>Design Building Information Model</td>
</tr>
<tr>
<td>FM/BAS</td>
<td>Facility Management / Building Automation System</td>
</tr>
<tr>
<td>FF&amp;E</td>
<td>Furniture, Furnishings, &amp; Equipment</td>
</tr>
<tr>
<td>GBxml</td>
<td>Green Building XML</td>
</tr>
<tr>
<td>GSA</td>
<td>General Services Administrations</td>
</tr>
<tr>
<td>GUID</td>
<td>Globally Unique Identifier</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating, Ventilation, and Air-Conditioning</td>
</tr>
<tr>
<td>IFC</td>
<td>Industry Foundation Classes</td>
</tr>
<tr>
<td>LOD</td>
<td>Level of Detail</td>
</tr>
<tr>
<td>MEPP</td>
<td>Mechanical, Electrical, Plumbing, Fire Protection</td>
</tr>
<tr>
<td>PER</td>
<td>Preliminary Engineering Report</td>
</tr>
</tbody>
</table>

-- End of Section --
INSTRUCTIONS AND REFERENCE INFORMATION

This template is a tool that is provided to assist in the development of a BIM Project Execution Plan (PxP) as required per Awarded Contract or Proposal Submission Requirements. It was adapted from the National BIM Standard (NBIMS) – US Version 2, Section 5.4 BIM Project Execution Plan Content – Version 2.1, BIM Project Execution Plan Template. For Reference Information only on content in this template, such as BIM Use definitions please see the NBIMS Chapter 5 Practice Documents and related Section 5.3 BIM Project Execution Planning Guide at www.nationalbimstandard.org.

The U.S. Air Force is an Alliance Sponsor Member of the National Institute of Building Sciences (NIBS) http://www.nibs.org/?page=organizations. NBIMS is a product of the Building SMART Alliance which serves as a Council of NIBS http://www.nibs.org/?page=bsa.

Instructions and examples to assist with the completion of this guide are currently in red. The text can and should be modified to suit the needs of the organization filling out the template. If modified, the format of the text should be changed to match the rest of the document. This can be completed, in most cases, by selecting the normal style in the template styles.

Questions pertaining to an individual solicitation shall be directed to the advertising district's contracting specialist for that solicitation.

Questions pertaining to this template should be directed to AFCEC Workflow (afcec.cf.workflow@us.af.mil), Paul Womble (paul.womble@us.af.mil), or Jose Castro-Rodriguez (jose.castro-rodriguez@us.af.mil).
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SECTION E: BIM PROCESS DESIGN ...................................................................................................................... 8
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SECTION M: ATTACHMENTS ................................................................................................................................. 18
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SECTION A: PROJECT INFORMATION

Unless otherwise noted, text in black is a contract requirement and shall not be modified. Instructions and examples to assist with the completion of the PxP are in red. Red text shall be deleted from the final PxP. Additional text may be added to suit the needs of the USAF proponent. If modified, the format of the text should be changed to match the rest of the document. The PxP is primarily written from the point of view that the project will be executed as a Design-Build (D-B) contract since that is the USAF’s preferred method of execution. The document should be modified for Design-Bid-Build (D-B-B) execution. Notes in red text discussing variations to the PxP for D-B-B execution are provided where appropriate. The D-B contractor or the D-B-B Architect-Engineer (A-E) shall complete the PxP, and submit it for Government review and acceptance. D-B projects should include a Section in the RFP that discusses the requirements for the BIM and require the completion of the PxP by the D-B contractor as a submittal. For D-B-B projects, the A-E shall complete the PxP. BIM requirements for the Construction Contractor should be included in the project Specifications, and include the PxP as an attachment. The D-B-B Construction Contractor should complete a PxP for the “as-built” Record BIM. One PxP should be completed for each contract describing the means and methods to be employed for that contract scope. As a living document, it shall be updated whenever implementation details change for Government review and acceptance. At final handover, the PxP shall reflect the delivered end products and provided as reference for future consumers of the BIM.

It is preferable to the Air Force to have bidding firms accomplish a draft implementation plan to be used as a discriminator for possible award to the firms who propose maximum BIM use throughout the facility lifecycle. Whether the BIM Project Execution Plan is accomplished before or after award, the plan shall include using the BIM data for the minimum requirements delineated in the USAF MINIMUM BIM REQUIREMENTS.

To successfully execute Building Information Modeling (BIM) on a project, [AUTHOR COMPANY] has developed this detailed BIM Project Execution Plan. The BIM Project Execution Plan defines uses for BIM on the project (e.g. design authoring, design reviews, 3D coordination, and record modeling), along with a detailed process for executing BIM on this project.

U.S. AIR FORCE BIM MISSION STATEMENT

U.S. Air Force Strategic BIM Goals and Objectives are aligned to directly support the Air Force Civil Engineer (CE) mission identified in the 2011 CE Strategic Plan: “…provide, operate, maintain and protect sustainable installations as weapon-system platforms through engineering and emergency response services across the full mission spectrum.”

The Civil Engineer Strategic Plan identifies three Goals as the foundation of the CE Strategy:
- Build Ready Engineers,
- Build Great Leaders, and
- Build Sustainable Installations.

The project goals and BIM Uses identified in Section C have been developed to support the CE Strategic Plan. Except for some minor modifications in Section C, the BIM Uses were previously developed for the National BIM Standard. The identified BIM Uses are selected to meet the USAF goals that were developed to support the CE Strategic Plan

This section defines basic project reference information and will be conveyed to the to the AGENT PM from the USAF PM via Design Instruction...

1. FACILITY INTENDED END USER: E.G. US AIR FORCE, ETC.
2. PROJECT NAME: E.G. DORMITORY; MUST BE THE SAME AS SHOWN ON THE DD FORM 1391
3. PROJECT LOCATION: E.G. FAIRCHILD AFB, WA
4. CONTRACT TYPE: E.G. DESIGN-BUILD
5. FACILITY TYPE: LIST ALL FACILITIES IN THE CONTRACT; MUST BE THE SAME AS SHOWN ON THE DD FORM 1391
6. **BRIEF PROJECT DESCRIPTION:** NUMBER OF FACILITIES, GENERAL SIZE, ETC

7. **ADDITIONAL PROJECT INFORMATION:** UNIQUE BIM PROJECT CHARACTERISTICS AND REQUIREMENTS

8. **AGENT:** E.G. USACE, NAVFAC, AFCEC

9. **PROJECT NUMBERS:** E.G. AF PROJECT NUMBER AS SHOWN ON THE DD FORM 1391

<table>
<thead>
<tr>
<th>PROJECT INFORMATION</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGENT CONTRACT NUMBER:</td>
<td>E.G. W9126G-08-D-0000</td>
</tr>
<tr>
<td>TASK ORDER:</td>
<td>E.G. 0001</td>
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<tr>
<td>AGENT PROJECT NUMBER:</td>
<td>E.G. PN055198</td>
</tr>
<tr>
<td>CONTRACTOR INFORMATION</td>
<td>NUMBER</td>
</tr>
<tr>
<td>AF PROJECT NUMBER(S):</td>
<td>E.G. SXHT123456</td>
</tr>
</tbody>
</table>
# SECTION B: KEY PROJECT CONTACTS

The following is a list of the lead Designer of Record and BIM contacts for each organization on the project. Additional contacts can be included later in the document.

<table>
<thead>
<tr>
<th>ROLE</th>
<th>ORGANIZATION</th>
<th>NAME</th>
<th>EMAIL</th>
<th>TIME ZONE</th>
<th>PHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager (DM/CM)</td>
<td>AFCEC</td>
<td>John Doe</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Project Manager (DA/CA)</td>
<td>AGENT</td>
<td></td>
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<tr>
<td>Agent BIM Manager</td>
<td>AGENT</td>
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<tr>
<td>Installation Project Manager</td>
<td>AGENT</td>
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<td>Installation BCE POC</td>
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<tr>
<td>Project Manager(s)</td>
<td>Company</td>
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<tr>
<td>BIM Manager(s)</td>
<td>Companies</td>
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<tr>
<td>Architecture Lead</td>
<td>Company</td>
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<tr>
<td>Interior Design</td>
<td>Company</td>
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<tr>
<td>Structural Lead</td>
<td>Company</td>
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<tr>
<td>Furnishings Lead</td>
<td>Company</td>
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<tr>
<td>Equipment Lead</td>
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<tr>
<td>Landscape Architect Lead</td>
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<td>Civil Lead</td>
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<tr>
<td>Fire Protection Lead</td>
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<tr>
<td>Mechanical Lead</td>
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<tr>
<td>Plumbing Lead</td>
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<td>Electrical Lead</td>
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<tr>
<td>Telecom Lead</td>
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<tr>
<td>Other Project Roles</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
## SECTION C: PROJECT GOALS / BIM OBJECTIVES

Describe how the BIM Model and Facility Data are utilized to maximize project value (e.g. design alternatives, life-cycle analysis, energy analysis, sustainability analysis scheduling, estimating, material selection, pre-fabrication opportunities, site placement, etc.)

Reference [www.nationalbimstandard.org](http://www.nationalbimstandard.org) for the BIM Goal & Use Analysis Worksheet.

1. **MAJOR BIM GOALS / OBJECTIVES:**

   State the BIM Goals / Objectives. The USAF level goals are described below and should not be removed from the PnP. Additional project level BIM goals may be added.

<table>
<thead>
<tr>
<th>BIM GOAL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrate project-level BIMs with current and projected software tools.</td>
<td>Integrate BIM data with AF Facility Management and GeoBase geospatial tools. The current AF strategy for accomplishing this goal is to provide Construction Operations Building Information Exchange (COBie) data to populate Tririga and BUILDER databases and to geo-locate BIM models</td>
</tr>
<tr>
<td>Support the Total Force Civil Engineer team by providing NexGen IT integrated software tools</td>
<td>Project-level BIMs must utilize and integrate with approved AF software tools</td>
</tr>
<tr>
<td>Support sustainable installations and asset management</td>
<td>Provide BIM and software tools to support lifecycle-based program management aligned with other federal government entities and universally adopted standards. Implement BIM-based planning, design and construction and by delivering a BIM model that integrate with approved facility management tools/software Apply BIM-enabled FM systems to optimize management of RP resources. Implement BIM-based energy modeling during Programming/Requirements Development and Design phases and implement BIM-based EMCS sensor planning/monitoring</td>
</tr>
<tr>
<td>Eliminate conflicts</td>
<td>Clash Detection software is used during the design and construction phases to identify conflicts by comparing 3D models of building systems. The goal of clash detection is to eliminate the major system conflicts prior to installation. The information model is then used to create detailed control points to aid in assembly layout. An example of this is layout of foundations using a total station with points preloaded and/or using GPS coordinates to determine if proper excavation depth is reached.</td>
</tr>
<tr>
<td>Accurate 3D Record Model for FM Team</td>
<td>The Record Model shall, at a minimum, contain the culmination of all the BIM modeling throughout the project, including linking Operation, Maintenance, and Asset data to the as-built model (created from the Design, Construction, 4D Coordination Models, and Subcontractor Fabrication Models) to deliver an accurate Record Model to the Air Force asset manager. Additional information including equipment (computer racks, UPS, material handling; where applicable) and space planning system shall be included to ensure they interface properly with building systems. For D-B-B projects, the A-E will develop the Design Model and Specifications for the Construction Contractor for producing the Record Model</td>
</tr>
</tbody>
</table>
2. **BIM USES:**
The BIM Uses currently highlighted/shaded and checked with an (X) are required by USAF BIM Requirements. Contractor to identify with a (C) additional BIM Uses for the project selected as Contractor Electives. Reference BIM Project Execution Planning Guide at www.nationalbimstandard.org for BIM Use descriptions. Include additional BIM Uses as applicable in empty cells of Design and Construct columns. Do not complete Plan and Operate Columns.

<table>
<thead>
<tr>
<th>PLAN (NIC)</th>
<th>DESIGN</th>
<th>CONSTRUCT</th>
<th>OPERATE (NIC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGRAMMING</td>
<td>DESIGN AUTHORING</td>
<td>SITE UTILIZATION PLANNING</td>
<td>BUILDING SYSTEM ANALYSIS</td>
</tr>
<tr>
<td>SITE ANALYSIS</td>
<td>DESIGN REVIEWS</td>
<td>CONSTRUCTION SYSTEM DESIGN</td>
<td>ASSET MANAGEMENT</td>
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<tr>
<td></td>
<td>3D COORDINATION - INTERFERENCE MANAGEMENT</td>
<td>X 3D COORDINATION - INTERFERENCE MANAGEMENT</td>
<td>SPACE MANAGEMENT / TRACKING</td>
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<td></td>
<td>ENGINEERING ANALYSIS - STRUCTURAL</td>
<td>DIGITAL FABRICATION</td>
<td>DISASTER PLANNING</td>
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<tr>
<td></td>
<td>ENGINEERING ANALYSIS - LIGHTING</td>
<td>X 3D CONTROL AND PLANNING / DIGITAL LAYOUT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ENGINEERING ANALYSIS - ENERGY</td>
<td>X RECORD MODELING</td>
<td>RECORD MODELING</td>
</tr>
<tr>
<td></td>
<td>PROGRAM VALIDATION</td>
<td>FIELD / MATERIAL TRACKING</td>
<td></td>
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<tr>
<td></td>
<td>ENGINEERING ANALYSIS - MECHANICAL</td>
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<td></td>
<td>3D CONTROL AND PLANNING (DIGITAL LAYOUT) - GEOLOCATING THE PROJECT</td>
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<tr>
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<td>SUSTAINABILITY (LEED) EVALUATION</td>
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<td>ENGINEERING ANALYSIS – OTHER (PER CONTRACT REQUIREMENTS)</td>
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<tr>
<td></td>
<td>CODE VALIDATION</td>
<td></td>
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<tr>
<td>PHASE PLANNING (4D)</td>
<td>PRELIMINARY CONSTRUCTION SCHEDULING (4D)</td>
<td>CONSTRUCTION SCHEDULING (4D)</td>
<td>BUILDING (PREVENTIVE) MAINTENANCE SCHEDULING (4D)</td>
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<tr>
<td>COST ESTIMATION (5D)</td>
<td>COST ESTIMATION (5D)</td>
<td>COST ESTIMATION (5D)</td>
<td>COST ESTIMATION (5D)</td>
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<td>EXISTING CONDITIONS MODELING</td>
<td>EXISTING CONDITIONS MODELING</td>
<td>EXISTING CONDITIONS MODELING</td>
</tr>
<tr>
<td>CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)</td>
<td>CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)</td>
<td>X CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)</td>
<td>X CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)</td>
</tr>
</tbody>
</table>

**BIM USE: CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE**

**Description:**
This is an interim process to achieve the Asset Management BIM Use by populating Record Model attributes and COBie spreadsheets to provide facility information to the USAF’s NextGen IT Facilities Management system. Facility data shall include all information associated with the Design and Constructions worksheets as well as the Spares worksheet from the Operations and Maintenance worksheets.

**Potential Value:**
- Store operations, maintenance owner user manuals, and equipment specifications for faster access.
- Maintain up-to-date facility and equipment data including but not limited to maintenance schedules, warranties, cost data, upgrades, replacements, damages/deterioration, maintenance records, manufacturer's data, and equipment functionality

**Resources Required:**
- Record Model
- COBie database
COBie Data Formats: The USAF’s Facility Management system is transitioning under the NextGen IT initiative to TRIRIGA and BUILDER. TRIRIGA is able to import COBie standard Omniclass formatted data via XML spreadsheets while BUILDER utilizes data formatted in Uniformat II. Facility asset data that will be maintained in BUILDER must first be uploaded into the BUILDER Remote Entry Database (BRED). Refer to the BRED Data Dictionary for data format requirements.

Team Competencies Required:
- Pre-design knowledge of which assets are worth tracking, whether the building is dynamic vs. static, and the end needs of the building to satisfy the end user
- Knowledge of the asset management system

Selected Resources:
- BUILDER Remote Entry Database (BRED) Data Dictionary
## SECTION D: ORGANIZATIONAL ROLES / STAFFING

For each BIM Use required and Contractor selected, identify the team within the organization (or organizations) who will staff and perform that Use. Staff members may fill multiple project roles.

<table>
<thead>
<tr>
<th>DESIGN PHASE BIM USE</th>
<th>ORGANIZATION</th>
<th>LOCATION(S)</th>
<th>LEAD CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESIGN AUTHORING</td>
<td>Contractor A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROGRESS REVIEWS</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DESIGN 3D COORDINATION</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3D CONTROL &amp; PLANNING (GEOLOCATING THE PROJECT)</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST ESTIMATION (5D)</td>
<td>E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COBIE</td>
<td>F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONSTRUCTION PHASE BIM USE</th>
<th>ORGANIZATION</th>
<th>LOCATION(S)</th>
<th>LEAD CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTRUCTION 3D COORDINATION</td>
<td>G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3D CONTROL &amp; PLANNING</td>
<td>H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECORD MODELING</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COBIE</td>
<td>J</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List enhancements from minimum BIM Uses as selected in Section C.2. Note: Enhancements must exceed minimum Contract requirements BIM Uses. (i.e. performing structural analyses on specific areas versus whole facility, performing cost / quantity take-off on specific floors versus whole facility, etc.) All documents and files related to the BIM uses shall be provided to the government as a submittal.

<table>
<thead>
<tr>
<th>SELECTED BIM USE ENHANCEMENT</th>
<th>DESCRIPTION / ADDED VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
SECTION E: BIM PROCESS DESIGN

Provide an Overview Process Map for all BIM Uses (Level 1). Provide Detailed Process Maps for each REQUIRED (marked with X) and Contractor-Elected (marked with C) BIM Use in Section D (Level 2). Sample Process Maps may be downloaded from www.nationalbimstandard.org for your use. (Please note that these are sample maps and should be modified based on project specific information and requirements and contractor internal procedures and processes). Please reference the BIM Project Execution Planning Guide found at www.nationalbimstandard.org.

LEVEL ONE PROCESS OVERVIEW MAP: ATTACHMENT 1
LEVEL TWO DETAILED PROCESS MAP: ATTACHMENT 2
SECTION F: BIM INFORMATION EXCHANGE WORKSHEET

Model elements by discipline, level of detail, and any specific attributes important to the project are documented using information exchange worksheet. Reference Chapter Four: Defining the Requirements for Information Exchanges in the BIM Project Execution Planning Guide for details on completing this template. Submittal of these worksheets to the AGENT IS CURRENTLY NOT REQUIRED, however, it is suggested that the Contractor review and apply these worksheets with their Project Team.

1. LIST OF INFORMATION EXCHANGE WORKSHEET(S): ATTACHMENT 3

(The following are examples. Modify for specific project. Some Information Exchanges may need to be removed, while some information exchanges may need to be added.)

- Existing Conditions Modeling
- Programming
- Site Analysis
- Cost Estimation
- 4D Modeling
- Design / Progress Reviews
- Design Authoring
- Energy Analysis
- Structural Analysis
- Lighting Analysis
- 3D Coordination
- Site Utilization Planning
- 3D Control and Planning
- Record Modeling
- Maintenance Scheduling
- Building System Analysis
- Construction Operations Building Information Exchange (COBie)
- [Delete unused and add additional information exchange worksheets from list]
SECTION G: MINIMUM MODELING AND DATA REQUIREMENTS

1. MINIMUM MODELING MATRIX (M3): ATTACHMENT 4

Provide an M3 with Column ‘F’ filled to reflect the actual scope of work for the facility and site. Use the Minimum Modeling Matrix (M3) Template located at https://cadbim.usace.army.mil and submit as part of the PxP in Section M, Attachment 4.

Column ‘F’ of the M3 shall represent the actual scope of work and should not be filled out according to Contractor preference. The Contractor shall identify items in Column ‘F’ which are NOT included in the project scope for the facility and site.

2. ELECTIVE MODELING ENHANCEMENTS

List enhancements from minimum modeling requirements as specified in Contract. Note: Enhancements must exceed minimum Contract requirements of the M3. (i.e. using newer release of AEC CAD Standard or IFC Version, modeling all plumbing/HVAC system and not only 1.5" and above.)

<table>
<thead>
<tr>
<th>ENHANCEMENT</th>
<th>JUSTIFICATION</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
SECTION H: COLLABORATION PROCEDURES

1. COLLABORATION STRATEGY:
Describe how the project team will collaborate in development and execution of modeling for the project. Include items such as electronic communication requirements and procedures, document management, transfer, and updating, and record storage, etc.

2. COLLABORATION ACTIVITIES:
The following activities are required. Add any additional meeting activities as determined by the Project Team.

<table>
<thead>
<tr>
<th>ACTIVITY TYPE</th>
<th>REQUIRED PER CONTRACT</th>
<th>PROJECT STAGE</th>
<th>FREQUENCY</th>
<th>PARTICIPANTS</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIM REQUIREMENTS KICK-OFF</td>
<td>YES</td>
<td>D-B DESIGN</td>
<td>ONCE</td>
<td>w/ USACE DISTRICT BIM MANAGER AND END USER REPRESENTATIVE</td>
<td>WEB MEETING OR AGREED LOCATION</td>
</tr>
<tr>
<td>BIM EXECUTION PLAN DEMONSTRATION</td>
<td>YES</td>
<td>D-B DESIGN</td>
<td>ONCE</td>
<td>w/ USACE DISTRICT BIM MANAGER AND END USER REPRESENTATIVE</td>
<td>WEB MEETING OR AGREED LOCATION</td>
</tr>
<tr>
<td>DESIGN COORDINATION</td>
<td>YES</td>
<td>D-B DESIGN</td>
<td>WEEKLY</td>
<td>A-E</td>
<td>WEB MEETING OR AGREED LOCATION</td>
</tr>
<tr>
<td>OVER-THE-SHOULDER PROGRESS REVIEWS</td>
<td>YES</td>
<td>D-B DESIGN</td>
<td>MONTHLY</td>
<td>w/ AGENT</td>
<td>WEB MEETING OR AGREED LOCATION</td>
</tr>
<tr>
<td>DESIGN REVIEW CONFERENCE</td>
<td>YES</td>
<td>D-B DESIGN</td>
<td>EACH REVIEW CONFERENCE</td>
<td>w/ AGENT AND END USER REPRESENTATIVE</td>
<td>ON SITE</td>
</tr>
<tr>
<td>ANY OTHER BIM ACTIVITY THAT OCCURS WITH MULTIPLE PARTIES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION I: QUALITY CONTROL

1. OVERALL STRATEGY FOR QUALITY CONTROL
   Describe the strategy to control the quality of the model.

2. QUALITY CONTROL CHECKS
   The following checks shall be performed to assure quality.

<table>
<thead>
<tr>
<th>CHECKS</th>
<th>DEFINITION</th>
<th>RESPONSIBLE PARTY</th>
<th>SOFTWARE PROGRAM(S)</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>VISUAL CHECK</td>
<td>Ensure there are no unintended model components and the design intent has been followed</td>
<td>Name here</td>
<td>Software here</td>
<td>AT EVERY SUBMITTAL</td>
</tr>
<tr>
<td>INTERFERENCE CHECK</td>
<td>Detect problems in the model where two building components are clashing including soft and hard</td>
<td>Name here</td>
<td>Software here</td>
<td>AT EVERY SUBMITTAL</td>
</tr>
<tr>
<td>STANDARDS CHECK</td>
<td>Ensure that the BIM and AEC CADD Standard have been followed (fonts, dimensions, line styles, levels/layers, etc)</td>
<td>Name here</td>
<td>Software here</td>
<td>AT EVERY SUBMITTAL</td>
</tr>
<tr>
<td>MODEL INTEGRITY CHECKS</td>
<td>Describe the QC validation process used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements and the reporting process on non-compliant elements and corrective action plans</td>
<td>Name here</td>
<td>Software here</td>
<td>AT EVERY SUBMITTAL</td>
</tr>
<tr>
<td>VERSION UPDATING CHECK</td>
<td>Ensuring that all users are using the agreed upon version of the software and the method by which changing software version is completed</td>
<td>Name here</td>
<td>Software here</td>
<td>AT EVERY SUBMITTAL</td>
</tr>
<tr>
<td>REVISION AUTHORITY CHECK</td>
<td>Describe the method by which all users will be given access and extent of revision authority to versions of the model as updated.</td>
<td>Name here</td>
<td>Software here</td>
<td>AT EVERY SUBMITTAL</td>
</tr>
</tbody>
</table>
### SECTION J: TECHNOLOGICAL INFRASTRUCTURE NEEDS

**1. SOFTWARE:**

All submitted BIM Models and associated Facility Data shall be fully compatible with Autodesk Revit file format and the Autodesk Revit BIM Template for U.S. Air Force Projects. List software used to deliver BIM. Remove BIM Use and software that is not applicable. Describe procedure for changing the software version during project execution.

<table>
<thead>
<tr>
<th>BIM USE</th>
<th>USER</th>
<th>SOFTWARE</th>
<th>VERSION</th>
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<tbody>
<tr>
<td>DESIGN AUTHORING</td>
<td>ARCHITECTURAL</td>
<td>XYZ DESIGN APPLICATION</td>
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</tr>
<tr>
<td>DESIGN AUTHORING</td>
<td>STRUCTURAL</td>
<td>XYZ DESIGN APPLICATION</td>
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</tr>
<tr>
<td>DESIGN AUTHORING</td>
<td>MECHANICAL</td>
<td>XYZ DESIGN APPLICATION</td>
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</tr>
<tr>
<td>DESIGN AUTHORING</td>
<td>ELECTRICAL/TELECOM</td>
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<tr>
<td>DESIGN AUTHORING</td>
<td>FIRE PROTECTION</td>
<td>XYZ DESIGN APPLICATION</td>
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<tr>
<td>DESIGN AUTHORIZING</td>
<td>CIVIL</td>
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<td>DESIGN AUTHORIZING</td>
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<td>XYZ DESIGN APPLICATION</td>
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<td>SCHEDULING (4D)</td>
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<td>COST ESTIMATION (5D)</td>
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<td>EXISTING CONDITIONS MODELING</td>
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<td>SITE UTILIZATION PLANNING</td>
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<td>SITE UTILIZATION PLANNING</td>
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<td>CONSTRUCTION SYSTEM DESIGN</td>
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<td>CONSTRUCTION SYSTEM DESIGN</td>
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<tr>
<td>DIGITAL FABRICATION</td>
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<td>DIGITAL FABRICATION SOFTWARE</td>
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<td>3D CONTROL AND PLANNING</td>
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<td>3D CONTROL AND PLANNING SOFTWARE</td>
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<td>3D COORDINATION</td>
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<td>3D COORDINATION SOFTWARE</td>
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<td>DESIGN REVIEWS</td>
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<td>DESIGN REVIEWS SOFTWARE</td>
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<td>STRUCTURAL ANALYSIS</td>
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<td>STRUCTURAL ANALYSIS SOFTWARE</td>
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<td>LIGHTING ANALYSIS SOFTWARE</td>
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<td>ENERGY ANALYSIS SOFTWARE</td>
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<tr>
<td>SUSTAINABILITY EVALUATION</td>
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<td>SUSTAINABILITY EVALUATION SOFTWARE</td>
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<tr>
<td>CODE VALIDATION</td>
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<td>CODE VALIDATION</td>
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<td>PROGRAMMING</td>
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<td>PROGRAMMING</td>
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<td>SITE ANALYSIS</td>
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<tr>
<td>COBIE</td>
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</tbody>
</table>
2. **BIM AND CAD STANDARDS:**

   Identify items such as the BIM and CAD graphical, naming, and protocol standards, BIM Workspace version, and the version of IFC, etc.

   The submitted BIM Model – The BIM shall be in a native file format with linked performance based specifications (via e-SPECS for Revit with SpecsIntact integration), interactive for the user, and the model shall be provided in the AF standard platform (Autodesk Revit) and interoperable file format like the Industry Foundation Class (IFC).

   IFC Coordination View – The Contractor’s selected BIM application(s) and software(s) must be certified in the IFC Coordination View (2x3 or newer. See www.iai-tech.org). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.


<table>
<thead>
<tr>
<th>STANDARD</th>
<th>VERSION</th>
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</thead>
<tbody>
<tr>
<td>BIM Workspace:</td>
<td>Insert BIM software and version here</td>
</tr>
<tr>
<td>CAD Standard:</td>
<td>AEC CAD Standard 5.0</td>
</tr>
<tr>
<td>Industry Foundation Class:</td>
<td>IFC2x3</td>
</tr>
<tr>
<td>COBie:</td>
<td>COBie 2.24</td>
</tr>
</tbody>
</table>
SECTION K: MODEL ORGANIZATION

1. FILE NAMING STANDARD:
   List examples of file names by discipline

2. MODEL STRUCTURE:
   Describe and diagram how the Model is divided up. For example, by building, by floors, by zone, by areas, and/or discipline

3. MEASUREMENT AND COORDINATE SYSTEMS:
   Describe the measurement system (Imperial or Metric) and coordinate system (geo-reference) used
IN THIS SECTION, LIST THE BIM DELIVERABLES FOR THE PROJECT AND THE FORMAT IN WHICH THE INFORMATION WILL BE DELIVERED.

DURING THE SUBMITTAL STAGES, THE CONTRACTOR SHALL DELIVER THE CONSTRUCTION SCHEDULE WITH INFORMATION DERIVED FROM THE MODEL. PERIODIC QUALITY CONTROL MEETINGS OR CONSTRUCTION PROGRESS REVIEW MEETINGS SHALL INCLUDE QUALITY CONTROL REVIEWS ON THE IMPLEMENTATION AND USE OF THE MODEL FOR PROJECT SCHEDULING.

<table>
<thead>
<tr>
<th>BIM SUBMITTAL ITEM</th>
<th>STAGE</th>
<th>FORMAT</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Model, Facility/Site Data, Workspace in the native format and DWF format</td>
<td>ALL</td>
<td></td>
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</tr>
<tr>
<td>CAD files in the native format and DWF format</td>
<td>ALL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COBie data extract in Excel format</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Interactive Review Format (Bentley Navigator, Autodesk Navisworks, Adobe 3D PDF 7.0 (or later), Google Earth KMZ, etc)</td>
<td>ALL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revit Compare Tool report</td>
<td>CONSTRUCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA/QC reports – Model Standards Check Report</td>
<td>ALL</td>
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<td></td>
</tr>
<tr>
<td>QA/QC reports – CAD Standards Check Report</td>
<td>ALL</td>
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<tr>
<td>QA/QC reports – Model Integrity Validation</td>
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<tr>
<td>QA/QC reports - Visual Check Report</td>
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<tr>
<td>QA/QC reports - Interference Management Checks</td>
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<tr>
<td>IFC Coordination View</td>
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<tr>
<td>QA/QC reports - Other Design QA/QC Reports</td>
<td>ALL</td>
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</tr>
<tr>
<td>List of all submitted files (Excel spreadsheet preferred)</td>
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</tr>
<tr>
<td>Other BIM Deliverables</td>
<td>ALL</td>
<td></td>
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</tr>
</tbody>
</table>
SECTION M: ATTACHMENTS

Contractor/A-E shall complete and attach the required documents listed below to this Section of the PxP.

1. LEVEL ONE PROCESS OVERVIEW MAP FROM SECTION E
2. LEVEL TWO DETAILED BIM USE PROCESS MAP(S) FROM SECTION E
3. INFORMATION EXCHANGE REQUIREMENT WORKSHEET(S) FROM SECTION F
4. MINIMUM MODELING MATRIX (M3) AND DATA REQUIREMENTS FROM SECTION G
5. FILE NAMING STANDARD FROM SECTION L
6. OTHER AS APPLICABLE
SECTION N: REFERENCES

1. LEVEL 1 PROCESS OVERVIEW MAP: http://www.bim.psu.edu/Project/resources/default.aspx
2. LEVEL 2 DETAILED BIM USE PROCESS MAP(S): http://www.bim.psu.edu/Project/resources/default.aspx
5. Autodesk Revit BIM Template for US Air Force projects Version 2010:
   http://www.wbdg.org/references/afbim_tools.php
6. USACE Construction Operations Building Information Exchange (COBie):
   http://www.wbdg.org/pdfs/erdc_cerl_tr0730.pdf
7. BIM Project Execution Planning Guide: http://www.bim.psu.edu/Project/resources/default.aspx
8. BUILDER Remote Entry Database (BRED) Data Dictionary:
U.S. AIR FORCE

BUILDING INFORMATION MODELING

MINIMUM REQUIREMENTS

VERSION 2.1

FOR:
AIR FORCE CIVIL ENGINEER CENTER

18 February 2015
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SECTION A: PURPOSE AND CONTACT INFORMATION

This document represents the minimum BIM requirements for Air Force facilities projects. Additional BIM requirements may be incorporated on projects where appropriate in support of definitive objectives.

Questions pertaining to an individual solicitation shall be directed to the advertising district's contracting specialist for that solicitation.

Questions pertaining to this document should be directed to AFCEC Workflow (afcec.cf.workflow@us.af.mil), Paul Womble (paul.womble@us.af.mil), or Jose Castro-Rodriguez (jose.castro-rodriguez@us.af.mil).
Design and Construction Agents shall ensure proper synchronization of the BIM requirements with the project acquisition strategy (delivery, contracting and procurement methods). As an example: for traditional project delivery methods, requirements for data synchronization during construction may be established during the design contract execution, and must be coordinated with the construction contract.

Design and Construction Agents shall ensure contracts are coordinated to align responsibility with the chosen acquisition strategy.

Design and Construction Agents shall ensure the BIM execution plan is in support of the U.S. Air Force BIM objectives prior to approval of the BIM Execution Plan.

It is preferable to the Air Force to have bidding firms accomplish a draft implementation plan to be used as a discriminator for possible award to the firms who propose maximum BIM use throughout the facility lifecycle. Whether the BIM Project Execution Plan is accomplished before or after award, the plan shall include using the BIM data for the minimum requirements delineated in SECTION I.

Design and Construction Agents shall coordinate contract requirements to ensure appropriate contractual controls exist to ensure timely and effective implementation of the BIM Execution Plan. Such controls may include withholding of payment for design and construction for unacceptable performance in executing the Plan.
U.S. Air Force Strategic BIM Goals and Objectives are aligned to directly support the Air Force Civil Engineer (CE) mission identified in the 2011 CE Strategic Plan: “…provide, operate, maintain and protect sustainable installations as weapon-system platforms through engineering and emergency response services across the full mission spectrum.”

The Civil Engineer Strategic Plan identifies three Goals as the foundation of the CE Strategy:
- Build Ready Engineers,
- Build Great Leaders, and
- Build Sustainable Installations.

The project goals and BIM Uses identified in Section D have been developed to support the CE Strategic Plan. Except for some minor modifications in Section D, the BIM Uses were previously developed for the National BIM Standard. The identified BIM Uses are selected to meet the USAF goals that were developed to support the CE Strategic Plan.
### 1. MAJOR BIM GOALS / OBJECTIVES:

<table>
<thead>
<tr>
<th>BIM GOAL</th>
<th>DESCRIPTION</th>
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<tr>
<td>Integrate project-level BIMs with current and projected software tools.</td>
<td>Integrate BIM data with AF Facility Management and GeoBase geospatial tools. The current AF strategy for accomplishing this goal is to provide Construction Operations Building Information Exchange (COBie) data to populate Tririga and BUILDER databases and to geo-locate BIM models.</td>
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<td>Support the Total Force Civil Engineer team by providing NexGen IT integrated software tools</td>
<td>Project-level BIMs must utilize and integrate with approved AF software tools.</td>
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<tr>
<td>Support sustainable installations and asset management</td>
<td>Provide BIM and software tools to support lifecycle-based program management aligned with other federal government entities and universally adopted standards. Implement BIM-based planning, design and construction and by delivering a BIM model that integrate with approved facility management tools/software. Apply BIM-enabled FM systems to optimize management of RP resources. Implement BIM-based energy modeling during Programming/Requirements Development and Design phases and implement BIM-based EMCS sensor planning/monitoring.</td>
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<tr>
<td>Eliminate conflicts</td>
<td>Clash Detection software is used during the design and construction phases to identify conflicts by comparing 3D models of building systems. The goal of clash detection is to eliminate the major system conflicts prior to installation. The information model is then used to create detailed control points to aid in assembly layout. An example of this is layout of foundations using a total station with points preloaded and/or using GPS coordinates to determine if proper excavation depth is reached.</td>
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<tr>
<td>Accurate 3D Record Model for FM Team</td>
<td>The Record Model shall, at a minimum, contain the culmination of all the BIM modeling throughout the project, including linking Operation, Maintenance, and Asset data to the as-built model (created from the Design, Construction, 4D Coordination Models, and Subcontractor Fabrication Models) to deliver an accurate Record Model to the Air Force asset manager. Additional information including equipment (computer racks, UPS, material handling; where applicable) and space planning system shall be included to ensure they interface properly with building systems. For D-B-B projects, the A-E will develop the Design Model and Specifications for the Construction Contractor for producing the Record Model.</td>
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### BIM USES:
The BIM Uses highlighted/shaded and checked with an (X) are required USAF BIM Requirements. Additional BIM Uses may be identified on a project as applicable. Contractors may identify additional BIM Uses for the project as Contractor Electives. Reference the BIM Project Execution Planning Guide at www.nationalbimstandard.org for BIM Use descriptions.

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<td>X COST ESTIMATION (5D)</td>
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### BIM USE: CONSTRUCTION OPERATIONS BUILDING INFORMATION EXCHANGE

#### Description:
This is an interim process to achieve the Asset Management BIM Use by populating Record Model attributes and COBie spreadsheets to provide facility information to the USAF’s NextGen IT Facilities Management system. Facility data shall include all information associated with the Design and Constructions worksheets as well as the Spares worksheet from the Operations and Maintenance worksheets.

#### Potential Value:
- Store operations, maintenance owner user manuals, and equipment specifications for faster access.
- Maintain up-to-date facility and equipment data including but not limited to maintenance schedules, warranties, cost data, upgrades, replacements, damages/deterioration, maintenance records, manufacturer's data, and equipment functionality

#### Resources Required:
- Record Model
- COBie database
COBie Data Formats: The USAF’s Facility Management system is transitioning under the NextGen IT initiative to TRIRIGA and BUILDER. TRIRIGA is able to import COBie standard Omniclass formatted data via XML spreadsheets while BUILDER utilizes data formatted in Uniformat II. Facility asset data that will be maintained in BUILDER must first be uploaded into the BUILDER Remote Entry Database (BRED). Refer to the BRED Data Dictionary for data format requirements.

Team Competencies Required:
- Pre-design knowledge of which assets are worth tracking, whether the building is dynamic vs. static, and the end needs of the building to satisfy the end user
- Knowledge of the asset management system

Selected Resources:
- BUILDER Remote Entry Database (BRED) Data Dictionary
Multiple BIM platforms will generally be used across the design specialties and trades taking advantage of the strengths of the various platforms, therefore no specific BIM platform shall be mandated. The Contractor’s BIM Execution Plan shall define the BIM tools to be used in the execution of the project.

IFC Coordination View. The Contractor’s selected BIM application(s) and software(s) shall be certified in the IFC (Industry Foundation Class) Coordination View (2x3 or better). Submit any deviations from or additions to the IFC property sets for any new spaces, systems, and equipment for Government approval.

Contractors will use the Model and Facility Data to produce accurate Construction Documents. BIM associated submittals shall conform to the standards described below.
1. GENERAL:
Develop all designs using Building Information Modeling (BIM) and Computer Aided Design (CAD) software.

The use of BIM does not negate the need for delivery of CAD files used for the creation of the Construction Documents Drawings. Specification of a CAD file format for these drawings submitted shall not be used to limit which BIM application(s) or software(s) may be used for project development and execution.

Deliver the Model, CAD files, and Facility/Site Data, Workspace in the native format, DWF and PDF format for project manager review using viewer software or Adobe Acrobat Reader. The BIM shall be in a native file format with linked performance based specifications (via e-SPECS for Revit with SpecsIntact integration or similar), interactive for the user, and the model shall be fully compatible with the Air Force standard platform (Autodesk Revit) and in an interoperable file format like the Industry Foundation Class (IFC).

Deliver COBie data extract in Excel spreadsheet format.

Provide a list of all submitted files in Excel spreadsheet format.

Electronic submittals shall be on digital media acceptable to the Government. The electronic submittals shall be organized and structured supportive of archival and retrieval. The electronic submittals shall have a “dash-board” type feature to assist viewers navigate through the digital media and associated files. Files not using names which readily identify their content shall have appropriate Meta data attached to include searchable short descriptions of the file’s content or relevance.

2. OWNERSHIP AND RIGHTS TO DATA:
The Government has ownership of rights at the date of Design Completion or Closeout Submittal (as applicable) to all CAD files, BIM Model, and Facility Data developed for the Project in accordance with FAR Part 27. The Government may make use of this data following any deliverable, including interim or final submittals.

3. DESIGN AND CONSTRUCTION REVIEWS:
Design submittal drawings shall be sized per contract requirements and suitable for A3 (11”x17”) legible scaled reproduction.

Provide Models and CADD files for design and construction review submittals in DWG DWF & PDF format for project manager review using viewer software or Adobe Acrobat Reader.

Provide a COBie spreadsheet based on the current COBie spreadsheet template in Excel format. Refer to The COBie Guide located on the National Institute of Building Sciences (NIBS) website. Include Manufacturer’s Product Data, Operations and Maintenance data, Warranty data, and spares data. Provide data formatted for BUILDER and Tririga.

Provide a list of Construction Documents (e.g., drawings, elevations, design sections and schedules, details) produced from the Facility Data and updated as necessary for each submittal.

Perform design and construction reviews at each submittal stage to test the Model. This model review shall correlate to the actual submittal provided to the Government. Minimum model reviews include:

Visual Checks: Check to ensure the design intent has been followed and that there are no unintended elements in the Model.

Interference Management Checks: Locate conflicting spatial data in the Model where two elements are occupying the same space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location) and soft interferences (e.g. conflicts regarding equipment clearance, service access, fireproofing, insulation) in a written report and resolve.

IFC Coordination View: Provide an IFC Coordination View in IFC Express format for all deliverables. Provide exported property set data for all IFC supported named building elements. Provide IFC export configuration text file illustrating BIM to IFC assignments.
Model Standards/CAD Standards Check Reports: Provide a written report documenting that the BIM and AEC CADD Standard have been followed (fonts, dimensions, line styles, levels/layers, etc).

Model Integrity Validation: Provide a written report documenting the QC validation process used to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements and the reporting process on non-compliant elements and corrective action plans.

Project Scope Validation Check: Provide report of comparison of programmed scope (from the project Requirements Document) to actual design scope. The comparison shall either be done within the model platform itself or an external project review program approved by the Government. Actual NSF for the design shall be automatically generated within the model and not manually entered. The project scope validation check shall have a minimum of the following data points listed: Room Number, Department or Functional Area, Space Type, Room Name, Target NSF, Design Actual NSF, Calculated Delta between Target and Actual NSF for room, and calculated exceeds critical delta (yes or no). The project team shall establish a target “critical” delta or allowable variance for rooms at the beginning of the project (e.g. 2%). The project scope validation report will indicate rooms that fall outside of these established criteria.

Project Room Contents (PRC) Validation Check: Provide report of comparison of approved PRC list by room (from the project Requirements Document) to actual design PRC. The comparison shall either be done within the model platform itself or an external project review program approved by the Government. The report shall provide a list of rooms where the design PRC does not match the approved PRC and the specific items that do not match. The non-matching items list shall include at a minimum the PRC equipment item approved and expected, and the designed PRC item not matching.

Gross Area Tabulation Calculation: The contractor shall calculate the departmental gross square feet / meters (GSF / GSM) and the building GSF / GSM using the model’s automatic calculation attributes in accordance with gross square footage calculation guidance contained in AFI 32-1084 Facility Requirements. The total building Gross Area Tabulation report shall as a minimum identify total mechanical gross, circulation gross, electrical gross and overall building gross area factor.

A 3-D interactive review format of the Model in Bentley Navigator, Navisworks, Adobe 3D PDF 9.0 (or later), Google Earth KMZ or other format per Execution Plan requirements. The file format for reviews can change between submittals.

Change Tracking Report: The contractor shall provide documentation of changes made to the Model at each stage utilizing software tools such as the Revit Compare Tool.

During the Construction Submittal stages, the Contractor shall deliver the construction schedule with information derived from the Model.

4. Final Record Model and CAD Data:
The following shall be required of the construction contractor.

Submit the final Record Model, Facility, and CAD Data files reflecting as-built conditions for Government Approval prior to project closeout.

Record Models shall contain updated and accurate parameter data at the time of submittal.

The Record Model shall update the final design Model, Facility, and CAD Data files reflecting as-built conditions for Government Approval. Update the design model assemblies with actual manufacturer BIMs (when available) as part of the Record Model. Provide Operations and Maintenance, Product, and Warranty data within the as-built model. Include updates from all Field Changes and Contract Modifications.

Provide a COBie spreadsheet based on the current COBie spreadsheet template in Excel format. Refer to The COBie Guide located on the National Institute of Building Sciences (NIBS) website. Include Manufacturer’s Product Data, Operations and Maintenance data, Warranty data, and spares data. Provide data formatted for BUILDER and Tririga.
 SECTION G: QUALITY CONTROL

At each stage provide a Contractor-certified written report with each design submittal, confirming that consistency checks as identified in this Section have been completed for the design submittal. This report shall be discussed as part of the design review conference and shall address cross-discipline interferences, if any.

Visual Check: Ensure there are no unintended model components and the design intent has been followed

Interference Check: Locate conflicting spatial data in the Model where two elements are occupying the same physical space. Log hard interferences (e.g., mechanical vs. structural or mechanical vs. mechanical overlaps in the same location), and soft interferences (conflicts regarding service access, fireproofing, insulation), in a written report and document disposition.

Standards Check: Ensure that the BIM and A/E/C CADD Standard have been followed (fonts, dimensions, line styles, levels/layers, and other contract document formatting issues are followed per the A/E/C CADD Standard.)

Model Integrity Checks: Conduct QC validation processes to ensure that the Project Facility Data set has no undefined, incorrectly defined or duplicated elements and the report on non-compliant elements and corrective action. Provide justification acceptable to the Government of non-compliant elements if allowed to remain within the Model.

Version Updating Check: Ensure that all users are using the agreed upon version of the software and the method by which changing software version is completed

Revision Authority Check: Describe the method by which all users will be given access and extent of revision authority to versions of the model as updated.

Other QC Parameters: Develop such other QC parameters as Contractor deems appropriate for the Project and provide to the Government for concurrence.

Over-The-Shoulder Progress Reviews: Periodic quality control meetings or construction progress review meetings shall include quality control reviews on the implementation and use of the Model, including interference management and design change tracking information.
SECTION H: BIM PROJECT EXECUTION PLAN

Prior to the Initial Design Conference / design kick off and construction kickoff meeting, the contractor shall submit a BIM Project Execution Plan (PxP), documenting the BIM design and analysis technologies selected for the Project Model from concept development through the Record Model as a design, production, coordination, construction, and documentation tool and the collaborative process by which it shall be implemented. The Government shall confirm acceptability of the PxP or advise as to additional processes or activities necessary to be incorporated into the PxP. The PxP shall include the minimums defined herein. The PxP shall be synchronized with the project acquisition strategy applied.

The PxP shall describe BIM Uses during the design and construction phases. Additionally the PxP shall describe the handoff of BIM data and model to the Government over the course of the project execution and turn over.

The PxP shall identify how the BIM data will be managed and interoperate (data storage, sharing, viewing, quality control, and updating, as necessary) among all project team members.

Within thirty (30) days after the acceptance of the PxP, conduct a demonstration at the Initial Design (and Construction, if separate contracts) Conference to review the PxP for clarification, and to verify the functionality of Model technology workflow and processes. If modifications are required, the Contractor shall complete the modifications and resubmit the final PxP for Government acceptance.
SECTION I: USAF BIM REQUIREMENTS

1. CONTRACT PLANNING REQUIREMENTS:
Provide a Project Execution Plan (PxP) prior to the Initial Design Kick-Off Meeting, using this document.

Provide a PxP demonstration at the Initial Design Review Conference to review the Implementation Plan for clarification, and to verify the functionality of Model technology workflow and processes. The Government shall confirm acceptability of the Plan or propose additional processes or activities necessary to be incorporated into the Plan. If modifications are required, the Contractor shall execute the modifications and resubmit the final Implementation Plan for Government acceptance prior to payments for design or construction.


2. GENERAL BIM REQUIREMENTS:
Provide BIM files using the Air Force Blanket Purchase Agreement (BPA) for Autodesk Revit BIM software.

Use BIM application(s) and software(s) compatible with International Alliance for Interoperability (IAI) Industry Foundation Class (IFC) standards 2x3 or newer.

Provide 3D graphic model(s) (the “Model”) and associated intelligent attribute data (“Facility Data”) to produce accurate Construction Documents.

Provide linked, interactive specifications utilizing e-SPECS for Revit with SpecsIntact integration.

Application and software(s) must be certified in the IFC Coordination View (2x3 or newer. See www.iai-tech.org). Deviations from or additions to the IFC property sets for any new spaces, systems, and equipment must be submitted for Government approval.

Facility data shall be compliant with Construction Operations Building Information Exchange (COBie); see http://www.wbdg.org/resources/cobie.php for more information.

3. DESIGN STAGE BIM REQUIREMENTS:
Develop a Project Execution Plan PxP. Conduct a BIM Requirements Kick-Off meeting to review the PxP and provide an overview of the use of BIM in the development and support of the project construction schedule.

Conduct quality control reviews as required in Section G.

Provide Files used for the creation of Construction Documents (drawings) per the Design Agent’s criteria and as noted herein. Non-BIM files used to create Conceptual, Schematic and Design Development items are excluded from this requirement.

Early-stage preliminary development of Model components and Facility Data. Review the Model with the Government for conformity to the program, massing, circulation, fire protection, and security and sustainability requirements consistent with the Project Execution Plan.

The Model shall include all disciplines and facility data, as applicable to the level of development.

Final design submissions shall include all required design elements. Secure Government acceptance of the Model from the Government before proceeding with commencement of construction.

Cost Estimating. Provide an overview of the use of BIM in the development and support of cost estimating, cost analysis, and estimate validation in the PxP.
Extracted Quantities. Use extracted quantities from the BIM for use within the cost estimate so that accurate costs can be developed. Tasks and their extracted quantities from the BIM shall be broken down by system, subsystem, or product as defined by the Level of Development in USACE’s Minimum Model Matrix. Coordinate breakdown structure with the Design Agent’s cost engineer. Since the BIM output will not generate all quantities necessary to develop a complete and accurate cost estimate of the project based on the design, estimators shall provide a gap cost to account for this granularity. Note that this requirement is primarily for D-B-B projects at this time.

4. CONSTRUCTION STAGE BIM REQUIREMENTS:
Note that for D-B-B projects, the A-E will produce the Design Model and provide specifications for the Construction Contractor to fulfill the requirements indicated below.

Develop a Project Execution Plan PxP. Conduct a BIM Requirements Kick-Off meeting to review the PxP and provide an overview of the use of BIM in the development and support of the project construction schedule.

Conduct periodic quality control reviews as required in Section G.

During the construction submittal stage, the Contractor shall deliver the construction schedule with information derived from the Model.

Model Driven RFIs and/or Change Orders. [Include in a future demonstration project]

Project Billing and cost loaded schedule developed from the Model. [Include in a future demonstration project]

5. GENERAL MODEL AUTHORING REQUIREMENTS:
Provide Project Specific BIM Facility Data consisting of a set of intelligent elements for the Model (e.g., doors, air handlers, electrical panels). This Facility Data shall include all material definitions, qualities, and attributes that are necessary for the project facility design. Data format must be compatible with the Facility Management software (BUILDER and Tririga) for subsequent database searches.

Model Granularity. Models may vary in level of detail for individual elements within a model, but at a minimum must include all features that would be included on a quarter inch (1/4” = 1’0”) scaled drawing (e.g. at least 1/16th, 1/8th and 1/4th), or appropriately scaled civil drawings.

6. SPECIFIC BIM MODEL AUTHORING REQUIREMENTS:
The BIM Model Authoring Requirements described below generally conform to USACE’s Minimum Modeling Matrix (M3). Contract language detailing the minimum BIM requirements, including the completed M3, should be reviewed to ensure that these Air Force requirements are included.

Architecture & Interior Design. The Architectural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

- Space Measurements. The Model shall include spaces defining accurate net square footage and net volume, and holding data for the room finish schedule for including room names and numbers. Include Programmatic Information provided by the Government or validated program to verify design space against programmed space, using this information to validate area quantities. The model shall provide accurate gross area tabulations for use in validating DD Form 1391 programmatic requirements and for use in generating the DD Form 1354.

- Walls and Curtain Walls. Each wall shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect wall types. The Model shall include all walls, both interior and exterior, and the necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

- Doors, Windows, Clearstories and Louvers. Doors, windows and louvers shall be depicted to represent their actual size, rating, type and location. Doors and windows shall be modeled with the necessary intelligence to produce accurate window and door schedules.
• Roof. The Model shall include the roof configuration, drainage system, major penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

• Floors. The floor slab shall be developed in the structural Model and then referenced by the architectural Model for each floor of the Project building.

• Ceilings. All heights and other dimensions of ceilings, including soffits, ceiling materials, or other special conditions shall be depicted in the Model with the necessary intelligence to produce accurate plans, building sections and generic wall sections where ceiling design elements are depicted.

• Vertical Circulation. All continuous vertical components (i.e., non-structural shafts, architectural stairs, handrails and guardrails) shall be accurately depicted and shall include the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

• Architectural Specialties and Woodwork. All architectural specialties (i.e., toilet room accessories, toilet partitions, grab bars, lockers, and display cases) and woodwork (i.e., cabinetry and counters) shall be accurately depicted with the necessary intelligence to produce accurate plans, elevations and sections in which such design elements are referenced.

• Signage. The Model shall include all signage and the necessary intelligence to produce accurate plans and schedules.

• Schedules. Provide door, window, hardware, sets using BHMA designations, flooring, and wall finish, and signage schedules from the Model, indicating the type, materials and finishes used in the design.

• Furniture/Fixtures/Equipment (FFE). 3D representation of FFE elements is preferred. For projects with an extensive systems furniture layout that may impact BIM system performance the Contractor will consult with the Government for consideration of 2D representation. The FFE systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:
  - Furniture (INCLUDE AS REQUIRED) The furniture systems Model may vary in level of detail for individual elements within a Model, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing, and shall include all relevant office equipment and furniture system layouts, with necessary intelligence to produce accurate plans, sections, perspectives and elevations necessary to completely depict furniture systems locations and sizes.
  - Systems Coordination. Furniture that makes use of electrical, data, plumbing or other features shall include the necessary intelligence to produce coordinated documents and data.
  - Fixtures and Equipment Fixtures and equipment shall be depicted to meet layout requirements with the necessary intelligence to produce accurate plans, elevations, sections and schedules depicting their configuration.
  - Schedules Provide furniture and equipment schedules from the model indicating the materials, finishes, mechanical, and electrical requirements.

Structural. The structural systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

• Foundations. All necessary foundation and/or footing elements, with necessary intelligence to produce accurate plans and elevations.

• Floor Slabs. Structural floor slabs shall be depicted, including all necessary recesses, curbs, pads, closure pours, and major penetrations accurately depicted.

• Structural Steel. All steel columns, primary and secondary framing members, and steel bracing for the roof and floor systems (including decks), including all necessary intelligence to produce accurate structural steel framing plans and related building/wall sections.

• Cast-in-Place Concrete. All walls, columns, and beams, including necessary intelligence to produce accurate plans and building/wall sections depicting cast-in-place concrete elements.

• Expansion/Contraction Joints. Joints shall be accurately depicted.
Stairs. The structural Model shall include all necessary openings and framing members for stair systems, including necessary intelligence to produce accurate plans and building/wall sections depicting stair design elements.

Shafts and Pits. The structural Model shall include all necessary shafts, pits, and openings, including necessary intelligence to produce accurate plans and building/wall sections depicting these design elements.

Mechanical. The mechanical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

- HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grills and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules. All piping larger than 1.5” diameter shall be modeled.

- Mechanical Piping. All necessary piping and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules. All piping larger than 1.5” diameter shall be modeled.

- Plumbing. All necessary plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All piping larger than ½” diameter shall be modeled.

- Equipment Clearances. All HVAC and Plumbing equipment clearances shall be modeled for use in interference management and maintenance access requirements.

- Elevator Equipment. The Model shall include the necessary equipment and control system, including necessary intelligence to produce accurate plans, sections and elevations depicting these design elements.

- Schedules. The construction drawings shall include equipment schedules that are of the BIM native schedules. Equipment shall not be generated in third party software and inserted on the drawings as raster images, detail lines and text, AutoCAD line work and text, or other non-BIM format for aesthetic reasons. The data in the schedules as printed on the contract drawings shall be the exact same data as in the model.

Electrical/Telecommunications. The electrical systems Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4”=1’0”) scaled drawing. Additional minimum Model requirements include:

- Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panel boards and control systems), including necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents. Lighting and power built into furniture/equipment shall be modeled.

- Special Electrical Systems. All necessary special electrical components (i.e., security, Mass Notification, Public Address, nurse call and other special occupancies, and control systems), including necessary intelligence to produce accurate plans, details and schedules.

- Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, communications, grounding systems and bonding), including necessary intelligence to produce accurate plans, details and schedules.

- Communications. All existing and new communications service controls and connections, both above ground and underground with necessary intelligence to produce accurate plans, details and schedules. Cable tray routing shall be modeled without detail of cable contents. Communications conduit larger than 1.5” shall be modeled.

- Exterior Building Lighting. All necessary exterior lighting with necessary intelligence to produce accurate plans, elevations and schedules. The exterior building lighting Model shall include all necessary lighting, relevant existing and proposed support utility lines and equipment required with necessary intelligence to produce accurate plans, details and schedules.
AIR FORCE CIVIL ENGINEER CENTER

- Equipment Clearances. All lighting and communications equipment clearances and no-fly zones shall be modeled for use in interference management and maintenance access requirements. Include Original Model Based Schedules for all equipment. No fabricated or extraneously produced Schedules will be accepted.

- Schedules. The construction drawings shall include equipment schedules that are of the BIM native schedules. Equipment shall not be generated in third party software and inserted on the drawings as raster images, detail lines and text, AutoCAD line work and text, or other non-BIM format for aesthetic reasons. The data in the schedules as printed on the contract drawings shall be the exact same data as in the model.

Fire Protection. The fire protection system Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1’0") scaled drawing. Additional minimum Model requirements include:

- Fire Protection System. All relevant fire protection components (i.e., branch piping, sprinkler heads, fittings, drains, pumps, tanks, sensors, control panels) shall be indicated with necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All fire protection piping shall be modeled. In a D-B-B project where the suppression system is specified through a performance specification and designed by the Construction Contractor, the A-E will provide the Design Model with associated FPS components appropriate to the level of design, and provide specifications for the Construction Contractor to the final installed FPS in the Record Model.

- Fire Alarms. Fire alarm/mass notification devices and detection system shall be indicated with necessary intelligence to produce accurate plans depicting them.

Civil. The civil Model may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a one inch (1”=100’) scaled drawing. Additional minimum Model requirements include:

- Digital Terrain Model (DTM). Model all relevant site conditions and proposed grading, including necessary intelligence to produce accurate Project site topographical plans and cross sections.

- Drainage. Model all existing and new drainage piping, including upgrades thereto, including necessary intelligence to produce accurate plans and profiles for the Project site.

- Storm Water and Sanitary Sewers. Model all existing and new sewer structures and piping, including upgrades thereto, on the Project site with necessary connections to mains or other distribution points as appropriate, including necessary intelligence to produce accurate plans and profiles for the Project site.

- Utilities. Model all necessary new utilities connections from the Project building(s) to the existing or newly-created utilities, and all existing above ground and underground utility conduits, including necessary intelligence to produce accurate plans and site-sections.

- Roads and Parking. Model all necessary roadways and parking lots or parking structures, including necessary intelligence to produce accurate plans, profiles and cross-sections.
SECTION J: REFERENCES

5. BIM Project Execution Planning Guide: [http://www.bim.psu.edu/Project/resources/default.aspx](http://www.bim.psu.edu/Project/resources/default.aspx)
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1. GENERAL INSTRUCTIONS

1. Modify Column F on Tab "3. Scope-LOD-Grade" to indicate the Elements included in the Project scope.
2. Filters are available to sort and limit column data in the table.
3. Discipline and Notes columns are available as a convenience and are not a contractual requirement.
4. Bi-directional hyperlinks are available in column headers, Element IDs, and Modeling Requirements.
2. DEFINITIONS

2.1. LEVEL OF DEVELOPMENT DEFINITIONS (ACCURACY)

The following LOD descriptions identify the specific element requirements for each Model Element.

<table>
<thead>
<tr>
<th>LOD</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>●</td>
<td>Refer to the specific child element for appropriate LOD. (Used for categories that have multiple sub-elements for which varying LOD apply.)</td>
</tr>
<tr>
<td>100</td>
<td>Model Elements indicative of area, height, volume, location, and orientation may be modeled geometrically or represented by other data (i.e., a pump would be a cube.)</td>
</tr>
<tr>
<td>200</td>
<td>Model Elements are modeled as generalized systems or assemblies with approximate quantities, size, shape, location, and orientation. Non-geometric information may also be attached to Model Elements (i.e., a pump would be a generic pump of approximate size.)</td>
</tr>
<tr>
<td>300</td>
<td>Model Elements are modeled as specific assemblies accurate in terms of quantity, size, shape, location, and orientation. Non-geometric information may also be attached to Model Elements. Accurate to the degree dimensioned or indicated on contract documents (i.e., a pump would be a generic pump of accurate size complete with connections and clearances for a complete system.)</td>
</tr>
</tbody>
</table>

2.2. ELEMENT GRADE DEFINITIONS (FORMAT)

Within each Level of Development, there is the potential to represent information in various formats. In practice, it has been proven that there are certain elements for which there is a greater benefit in providing 3-dimensional representation, while in others drafting or representation in the form of narratives is sufficient for a particular deliverable.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3D + Facility Data</td>
</tr>
<tr>
<td>B</td>
<td>2D + Facility Data</td>
</tr>
<tr>
<td>C</td>
<td>2D Only (Drafting, linework, text, and or part of an assembly)</td>
</tr>
<tr>
<td>+</td>
<td>Original Grade (A, B, or C) adjusted for contract changes and field conditions.</td>
</tr>
</tbody>
</table>
### 3. Frequently Asked Questions

1. **Question:** This seems like a lot of work. Why does the Corps need this?  
   **Answer:** The previous narrative method of Section 4 left too much up to interpretation. Submittals were not consistent. M3 does not require more modeling work than what was required previously and will help ensure clarity in what is asked for and consistency in what is received. It is also intended to help speed up the review process and also to lay the foundation for future requirements such as COBie, analysis, quantification and more.

2. **Question:** Does Column F in Tab 3 allow me to choose what I want to model or not?  
   **Answer:** No. Column F shall reflect items which are in the Facility or Site which are in scope for the Project. If the scope changes, update the PxP/M3 and resubmit for approval.

3. **Question:** Why are most of the columns in the spreadsheet locked and the values not editable?  
   **Answer:** M3 users are to edit Tab 3, Column F and optionally the Discipline and Notes columns. The values populated in the locked columns are the minimum contractual requirements and as such are not optional so long as the particular Element ID category (i.e. Column Foundations) is within the scope of the project.

4. **Question:** Why can’t I add rows for custom Element IDs?  
   **Answer:** The rows reflect standard classification systems. Maintaining these standard categories are necessary for consistent project delivery and review.

5. **Question:** I have an existing project which doesn’t use M3. If we get approval and document it in the PxP can we use it?  
   **Answer:** Yes. Please make sure to coordinate with the USACE Project Manager, USACE Geographic BIM Manager and resubmit the updated PxP/M3 for formal approval.

6. **Question:** Who do I contact with questions?  
   **Answer:** For Project-specific issues, please contact your USACE Project Manager and USACE Geographic BIM Manager. For general questions about the contract language, PxP, or M3, please contact Steve Hutsell (Steve.Hutsell@usace.army.mil) or Van Woods (Van.Woods@usace.army.mil).

7. **Question:** How do I submit a waiver?  
   **Answer:** Contact the USACE Project Manager and USACE Geographic BIM Manager.

8. **Question:** I have a question about how a specific object should be classified (for example, where does interior signage go)?  

9. **Question:** The content I have received and downloaded from various sources do not have the correct classification system values assigned (such as Templates, Workspaces, Manufacturer provided content, content from prior projects). Am I responsible for correcting it?  
   **Answer:** Yes.

10. **Question:** I work for USACE, should I have to use the PxP and M3 for in-house designed projects?  
    **Answer:** Yes.
4. Product-Specific M3 Guidance

The following platform specific instructions are provided to demonstrate the application of M3 requirements on two platforms, not as an endorsement of these or any specific vendors or platforms. M3 is specifically designed to be vendor and platform neutral and can be implemented by any platform that can store and report classification system values for each object. The following guidance is provided as-is, without support or guarantees. Use at your own risk.

4.1. Autodesk Revit M3 Guidance

If utilizing the UniFormat classification system, the requirement is to populate the Revit system parameter "Assembly Code" and ensure that it matches the UniFormat version in M3.

1. Download the M3 Resource Files from the USACE CAD/BIM Center website:
   A. Revit "container" file for QA/QC for UniFormat validation with Schedules and Filters.
   B. Assembly Code text file (updated to UniFormat 2010).

2. Update **UniformatClassifications.txt** on each machine requiring the updated classification system in Revit.
   A. NOTE: If you plan on using the Autodesk delivered classification system on other projects, make sure to create a backup of the original file.
   B. Place the downloaded UniformatClassifications.txt at the following path:
   `%AppData%\Autodesk\Revit\Autodesk Revit Architecture 2012\`

C. NOTE: The UniformatClassifications.txt file supplied for the Revit Assembly Code utilizes UniFormat 2010 to match M3 and replaces the original file that comes native to Revit which is based on UniFormat 2004. The updated format results in multiple benign journal file errors that do not effect the operation of Revit.
3. Revit QA/QC resources are available in **M3-ComplianceContainerFile.rvt**.
   A. To insert QA/QC Schedules: Insert Tab > Insert From File > Insert Views from File and select all schedules to insert.

4. Transfer Project Standards > Filters from the **M3-ComplianceContainer.rvt**
   A. In the same session of Revit as your project file, open **M3-ComplianceContainer.rvt**.
   B. Navigate to Manage > Transfer Project Standards > Select the proper file, Check NONE, and only select Filters.
5. As the project is constructed, verify that the appropriate UniFormat values are assigned to all content using:

A. Schedules to assign and report on Assembly Code

B. Filters of Views to help communicate and visualize both for compliance views as well as working views throughout the project’s progress.
4.2. Bentley AECOSim Building Designer M3 Guidance

1. Download the following from USACE CAD/BIM Center site:
   
i. The Tri-Service Workspace TS_WS_001
   
ii. M3 Resource Files

1a. Ensure the **Classifications files** are in the following folder
   TS_Workspaces\TS_WS_001\Workspace\Datasets\Building_US\data\classifications

2. Check to ensure that Classification is being placed on items. A way to check this is to place a component such as a Wall or a Door, and look for Classification.

3. Through the **Item Browser**, create a **Query** that will Search for items without a particular Classification, such as UniFormat.
   
   For example: through the Item Browser, select the Search function.
3a. Set the query to search for **Items by Common Properties, where the Classification | UniFormat property is NOT LIKE “?”**. Add to Search, and Select OK.

3b. This search will return all components in the model without the UniFormat property filled out. Select the links in the lower portion of the Item Browser to see all the items found.
3c. Right click on a column heading to turn off non-needed columns.

3d. Use the **Transparent**, the **Highlight** or the **Isolate** function in the Item Browser to help communicate and identify what items do not have a Classification assigned.

3e. Use the **Transparent** function to make the model transparent, and highlight the non-compliant items.

3f. Use the **Highlight** function to keep the model in the current display mode, and highlight the non-compliant items.

3g. Use the **Isolate** function to filter the model to only show and highlight the non-compliant items.

4. NOTE: the query can be Saved and re-used in the Item Set toolset.

5. NOTE: The zip file downloaded in Step 1.ii include ECQueries for isolating elements with UniFormat, OmniClass, or Masterformat. The files are named Uniformat.ecquery.xml, OmniClass.ecquery.xml, MasterFormat.ecquery.xml, and All_Classification_Location.ecquery.xml
5. References

OmniClass
Copyright © 2012 OCCS Development Committee Secretariat
Table 21 Pre-Consensus Approved Draft 2011-02-11
http://omniclass.org/

UniFormat 2010

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MasterFormat 2010

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6. M3 Change History

Version: 1.3 (SEPT-19-2014)
1. Corrected formatting issues and incorrect hyperlinks. No functional content changes.

Version: 1.2 (OCT-03-2013)
1. Change in method for documentation of contributors and credits, no functional content changes.

Version: 1.1 (AUG-01-2013)
1. Added BIM application specific M3 implementation guidance and associated resources.
2. Added hyperlinked Table of Contents.
3. Revised LOD 100 wording to remove "three dimensions" as 2D vs 3D is designated by Grade.
4. Fixed typo in FAQ section, added additional FAQ item, fixed typos on tab 2.
5. Fixed names in credits.

Version: 1.0 (SEPT-13-2012)
1. Initial Version.
# Minimum Modeling Matrix (M3)

Version: 1.3 (SEPT-19-2014)

## Level 01/02 Modeling Requirements

<table>
<thead>
<tr>
<th>Level 1</th>
<th><strong>A</strong> SUBSTRUCTURE:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Substructure elements, with necessary intelligence to produce plans, sections, elevations and schedules; including a depiction of expansion/construction joints.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>A40</strong> SLABS-ON-GRADE:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slabs-On-Grade shall be depicted with all necessary recesses, curbs, pads, slopes, closure pours, and major penetrations depicted. Slabs shall be developed in the Structural Model and then referenced by the Architectural Model.</td>
</tr>
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<tr>
<th>Level 1</th>
<th><strong>B</strong> SHELL:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Shell elements, with necessary intelligence to produce plans, sections elevations, and schedules; including a depiction of expansion/construction joints.</td>
</tr>
</tbody>
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<tr>
<th>Level 2</th>
<th><strong>B10</strong> SUPERSTRUCTURE:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All columns, primary and secondary framing members, and bracing for the roof and floor systems (including decks), including all necessary intelligence to produce structural framing plans, related building/wall sections, and schedules. Floor Decks and Slabs for Superstructure shall be developed in the Structural Model and then referenced by the Architectural Model.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>B20</strong> EXTERIOR VERTICAL ENCLOSURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exterior Vertical Enclosures shall be depicted to the exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect element types. Exterior Windows, Doors and Grilles, Louvers and Vents, Hardware Sets using BHMA designations and Wall Appurtenances shall be depicted to represent their actual size, type and location with the necessary intelligence to produce schedules.</td>
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<tr>
<th>Level 1</th>
<th><strong>C</strong> INTERIORS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Interiors Model may vary in level of detail for individual elements. All Interior elements shall be depicted exact height, length, width and ratings (thermal, acoustic, fire) to properly reflect element types, with necessary intelligence to produce plans, sections and elevations; including a depiction of expansion/construction joints.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Level 2</th>
<th><strong>C10</strong> INTERIOR WINDOWS, DOORS, LOUVERS AND VENTS, INTERIOR SPECIALTIES:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interior Finishes shall be included in the Facility Data of the host element with the necessary intelligence to produce schedules where applicable. Interior Windows, Doors and Grilles, Louvers and Vents, Hardware Sets using BHMA designations and Wall Appurtenances shall be depicted to represent their actual size, type and location with the necessary intelligence to produce schedules.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>C20</strong> INTERIOR FINISHES:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Interior Finishes shall be included in the Facility Data of the host element with the necessary intelligence to produce schedules.</td>
</tr>
<tr>
<td>Level 1</td>
<td><strong>D SERVICES:</strong></td>
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</tr>
<tr>
<td></td>
<td>All necessary Services elements including all major openings and penetrations, cable trays, cable bundles and pipe grouping (1-1/2” Ø and larger) shall be depicted with necessary intelligence to produce plans, sections, elevations and schedules where applicable. All clearances and insulation shall be accounted for in the model for use in interference management and maintenance access requirements. Nonpermanent items are not required to be modeled or contain facility data.</td>
</tr>
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<tr>
<th>Level 2</th>
<th><strong>D20 PLUMBING:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Plumbing Elements including plumbing piping and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce riser diagrams, and schedules where applicable. Small diameter (less than 1-1/2” NPS) field-routed piping is not required to be depicted in the Model. All gravity and insulated piping shall be modeled.</td>
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<thead>
<tr>
<th>Level 2</th>
<th><strong>D30 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC):</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Heating, Ventilation, and Air Conditioning (HVAC) elements including piping, fixture layouts and related equipment with necessary intelligence to produce riser diagrams, and schedules where applicable. Small diameter (less than 1-1/2” NPS) field-routed piping is not required to be depicted in the Model. All gravity and insulated piping shall be modeled.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>D40 FIRE PROTECTION:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Fire Protection elements including all piping, valves, and seismic bracing shall be modeled with necessary intelligence to produce plans, elevations, building/wall sections, riser diagrams, and schedules where applicable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>D50 ELECTRICAL:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Electrical elements including conduit, fixture layouts and related equipment (including power for systems furniture) with necessary intelligence to produce schedules where applicable. Small diameter (less than 1-1/2” Ø) field-routed conduit is not required to be depicted in the Model.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>D60 COMMUNICATIONS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All existing and new Communications elements, both above ground and underground, with necessary intelligence to produce schedules where applicable. Small diameter (less than 1-1/2” Ø) field-routed conduit is not required to be depicted in the Model.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>D70 ELECTRONIC SAFETY AND SECURITY:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Electronic Safety and Security elements with necessary intelligence to produce schedules. Small diameter (less than 1-1/2” Ø) field-routed conduit is not required to be depicted in the Model.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>D80 INTEGRATED AUTOMATION:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Integrated Automation elements with necessary intelligence to produce schedules. Small diameter (less than 1-1/2” Ø) field-routed conduit is not required to be depicted in the Model.</td>
</tr>
<tr>
<td>Level 1</td>
<td><strong>E EQUIPMENT AND FURNISHINGS:</strong></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>All Equipment and Furnishings elements shall be depicted with necessary intelligence to produce plans, sections, elevations and schedules, indicating the configuration, materials, finishes, mechanical, and electrical requirements. Representation of Movable Equipment and Furnishings elements shall be 2D with Facility Data. Contractor shall provide a minimal number of 3D representations as examples. Examples of Movable Equipment and Furnishings include, but are not limited to, desks, desktop printer, desktop computer, furniture systems, seating, tables, and office storage.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>E10 EQUIPMENT:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equipment that make use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents, data, and schedules where applicable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>E20 FURNISHINGS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed Furnishings that make use of electrical, data or other features shall include the necessary intelligence to produce coordinated documents, data, and schedules where applicable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 1</th>
<th><strong>F SPECIAL CONSTRUCTION AND DEMOLITION:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Special Construction and Demolition elements shall be depicted with necessary intelligence to produce plans, sections and elevations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 1</th>
<th><strong>G SITEWORK:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Sitework (DTM) elements shall be depicted with necessary intelligence to produce Project site, topographical plans, cross sections and profiles. All clearances shall be accounted for in the model for use in interference management and maintenance access requirements.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>G30 LIQUID AND GAS SITE UTILITIES:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Liquid and Gas Site Utilities elements with necessary intelligence to produce schedules where applicable. Small diameter (less than 1-1/2” Ø) field-routed piping and conduit is not required to be depicted in the Model.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th><strong>G40 ELECTRICAL SITE IMPROVEMENTS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Electrical Site Improvements including all lighting fixtures, relevant existing and proposed support utility lines and equipment with necessary intelligence to produce details and schedules where applicable.</td>
</tr>
</tbody>
</table>
PART 1  GENERAL

1.1  WARRANTY OF CONSTRUCTION
1.2  ADDITIONAL WARRANTY REQUIREMENTS
   1.2.1  Performance Bond
   1.2.2  Pre-Warranty Conference
   1.2.3  Equipment Warranty Identification
   1.2.4  Warranty Service Calls
   1.2.5  Equipment Warranty Booklet
1.3  SUBMITTALS
1.4  EQUIPMENT WARRANTY IDENTIFICATIONS TAGS
   1.4.1  GENERAL REQUIREMENTS
      1.4.1.1  Tags and Information
      1.4.1.2  Tags for Warranted Equipment
      1.4.1.3  Exclusion to Providing Tags
   1.4.2  EXECUTION
   1.4.3  Equipment Warranty Tag Replacement
1.5  WARRANTY OF DESIGN

PART 2  NOT USED

PART 3  NOT USED

-- End of Section Table of Contents --
PART 1  GENERAL

1.1  WARRANTY OF CONSTRUCTION

(a) Foremost and in addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of—

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished by the Contractor.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause.

(e) The Contractor's warranty with respect to work restored, repaired or replaced will run for 1 year from the date of restoration, repair or replacement. This provision applies equally to all items restored, repaired, or replaced under paragraph (c) and (d) above.

(f) The Government will notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. Repair work necessary to correct a warranty condition which arises to threaten the health or safety of personnel, the physical safety of property or equipment, or which impairs operations, habitability of living spaces, etc., will be performed by the Contractor on an immediate basis as directed verbally by the Government. Written verification will follow verbal instruction.

(g) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of verbal or written notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.
(h) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(i) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(j) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(k) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

(l) The Prime Contractor shall designate a representative to attend and chair warranty meetings that will be held each month at the project site for the duration of the warranty period, with government and subcontractor personnel as necessary. The meeting shall review past warranty corrections and response times, open warranty items, up-coming scheduled corrections, site investigations, and other issues.

1.2 ADDITIONAL WARRANTY REQUIREMENTS

1.2.1 Performance Bond

(a) It is understood that the Contractor's Performance Bond will remain effective for one (1) year from the date of acceptance.

(b) If either the Contractor or his representative doesn't diligently pursue warranty work to completion, the contractor and surety will be liable for all costs. The Government, at its option, will either have the work performed by others or require the surety to have it done. Both direct and administrative costs will be reimbursable to the Government.

1.2.2 Pre-Warranty Conference

(a) Prior to contract completion and at a time designated by the Contracting Officer or his authorized representative, the Contractor shall meet with the Contracting Officer or his authorized representative to develop a mutual understanding with respect to the requirements of the Paragraph: WARRANTY OF CONSTRUCTION. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect and other
details deemed necessary by the Contracting Officer or his authorized representative for the execution of the construction warranty shall be established/reviewed at this meeting.

(b) In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of the service representative which is authorized to initiate and pursue warranty work action on behalf of the Contractor and surety. This single point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any Contractual responsibilities in connection with the paragraph: WARRANTY OF CONSTRUCTION.

(c) Local service area is defined as the area in which the contractor or his representative can meet the response times as described in paragraph 1.2.4 and in any event shall not exceed 200 miles radius of the construction site.

1.2.3 Equipment Warranty Identification

The Contractor shall provide warranty identification tags on all mechanical and electrical equipment installed under this contract. Tags and installation shall be in accordance with the requirements of Paragraph: EQUIPMENT WARRANTY IDENTIFICATION TAGS.

1.2.4 Warranty Service Calls

The Contractor or his local service representative will respond to the site, to a call within the time periods as follows: Four (4) hours for Heating, Air Conditioning, Refrigeration, Air Supply and Distribution, Critical Electrical service Systems and Food Service Equipment and Twenty-Four (24) hours For All Other Systems.

1.2.5 Equipment Warranty Booklet

At or before 30 days prior to final inspection and acceptance of the work, the Contractor shall submit the data mentioned as follows:

The Contractor shall provided a Booklet, which consists of a listing of all equipment items (see paragraphs a. and b. below) which are specified to be guaranteed along with the warranty papers for each piece of equipment. Three (3) legible bound copies of the booklet shall be submitted for approval and shall be indexed alphabetically by equipment type. For each specific guaranteed item, the name, address, and telephone number shall be shown on the list for the subcontractor who installed equipment, equipment supplier or distributor, and equipment manufacturer. Completion date of the guarantee period shall correspond to the applicable specification requirements for each guaranteed item. The names of service representatives that will make warranty calls along with the day, night, weekend and holiday contacts for response to a call within the time period specified shall also be identified.

a. For Equipment in Place: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer, etc. This would include capital equipment and other nonexpendable supplies of a movable nature that are not affixed as an integral part of the facility and
may be removed without destroying or reducing the usefulness of the facility. Some examples are spare parts, special tools, manufacturing equipment, maintenance equipment, instruments, installed under this contract.

b. For Installed Building Equipment: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer, etc. This would include items of equipment and furnishings (including material for installation thereof), which are required to make the facility usable and are affixed as a permanent part of the structure. Some examples are plumbing fixtures, laboratory counters and cabinets, kitchen equipment, mechanical equipment, electrical equipment, and fire protection systems installed under this contract.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

- SD-11 Closeout Submittals
- Equipment Warranty Booklet

1.4 EQUIPMENT WARRANTY IDENTIFICATIONS TAGS

1.4.1 GENERAL REQUIREMENTS

The Contractor shall provide warranty identification tags on all Contractor and government furnished equipment which is Contractor installed.

1.4.1.1 Tags and Information

The tags and information shall be similar in format and size to the exhibits provided by this specification, and shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure-sensitive adhesive back, and shall be installed in a position that is easily (or most easily) noticeable. If the equipment surface is not suitable for adhesive back, Contractor shall submit his alternative to the Contracting Officer's Authorized Representative for review and approval. Contractor furnished equipment that has differing warranties on its components will have each component tagged.

1.4.1.2 Tags for Warranted Equipment

The tag for his equipment shall be similar to the following:

```
+------------------------------------------+
¦            EQUIPMENT WARRANTY            ¦
¦                                          ¦
¦      CONTRACTOR FURNISHED EQUIPMENT      ¦
¦                                          ¦
¦ MFG----------------MODEL NO.-----------  ¦
¦                                          ¦
¦ SERIAL NO.------------------------------ ¦
```

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1.4.1.3 Exclusion to Providing Tags

If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag. The Contractor's warranty expiration date and the final manufacturer's warranty expiration date will be determined as specified by the Paragraph "WARRANTY OF CONSTRUCTION".

1.4.2 EXECUTION

The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. The Contractor shall be responsible for scheduling acceptance inspection with the Contracting Officer (verbal and written notification required). If this inspection is delayed by the Contractor, the Contractor shall, at his own expense, update the in-service and warranty expiration dates on these tags.

1.4.3 Equipment Warranty Tag Replacement

Under the terms of this contract, the Contractor's warranty with respect to work repaired or replaced shall run for one year from the date of repair or replacement. Such activity shall include a data warranty identification tag on the repaired or replaced equipment. The tag shall be furnished and
installed by the Contractor, and shall be similar to the original tag, except that it should include the scope of repair and that the contractor's warranty expiration date will be one year from the date of acceptance of the repair or replacement. In the case of repair, the repair only will be covered by the extended warranty. In the case of replacement of a component, the component only will be covered by the extended warranty. In these cases, the original tags will not be removed, but an additional tag will be installed for the repair or component replacement.

1.5 WARRANTY OF DESIGN

(a) Foremost and in addition to any other warranties in this contract, the Contractor warrants that the design shall be performed in accordance with the Contract requirements. Design and design related construction not conforming to the Contract requirements shall be corrected at no additional cost to the Government. The standard of care for design is defined in paragraph (b) of Section 01 30 00.24 OTHER ADMINISTRATIVE AND SPECIAL REQUIREMENTS "RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN".

(b) The period of this warranty shall commence upon final completion and the Government's acceptance of the work, or in the case of the Government's beneficial occupancy of all or part of the work for its convenience, prior to final completion and acceptance, at the time of such occupancy.

(c) This design warranty shall be effective from the above event through the Statue of Limitations and Statute of Repose, as applicable to the state that the project is located in.

(d) The rights and remedies of the Government provided for under this clause are in addition to any other rights and remedies provided in this contract or by law.

PART 2 NOT USED

PART 3 NOT USED

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CONSTRUCTION-OPERATIONS BUILDING INFORMATION EXCHANGE (COBie)

02/2014

PART 1   GENERAL

1.1   SUBMITTALS

SD-01 Post Award Submittals

COBie Information Delivery Plan; G, DO

No later than 30 days after NTP, the contractor shall provide a COBie Information Delivery Plan to document their plan to complete the work described in this specification.

SD-05 Design Data Submittals

COBie-Specific Submittals; G, DO

Design Phase (60% Design Submittal) COBie File
Design Phase (100% Unreviewed Design Submittal) COBie File
Construction Documents Phase (100% Reviewed Design Submittal) COBie File
Construction 60% Fiscally Complete COBie File
Beneficial Occupancy Phase COBie File
Fiscal Completion Phase COBie File

COBie-Formatted Submittals; G, DO

Provide the following submittals, required elsewhere in this contract, in COBie-compatible format:

As-installed Equipment Schedule
As-Installed Warranty Tags
Approved Submittals
Door Schedule
Room Finish Schedule
Hardware Schedule
Signage Schedule
Spare Parts Schedule
Warranty Certificates and Data
Preventative Maintenance Plans
Diagnostic Testing Plans
Real Property Equipment Transfer Report
Operations and Maintenance Manuals

COBie Equipment Photographs; G, DO

Upon approval by the Government, provide a complete set of installed equipment photographs with each of the following COBie-Specific Submittals:

Construction 60% Fiscally Complete COBie File
Beneficial Occupancy Phase COBie File
Fiscal Completion Phase COBie File
1.2 QUALITY ASSURANCE

1.2.1 COBie-Specific Submittal Quality

Meet the following minimum quality standards for all COBie-Specific Submittals:

1.2.1.1 COBie Guide - General Requirements

The UNITED STATES NATIONAL BUILDING INFORMATION MODEL STANDARD (NBIMS-US) defines the minimum quality standards for COBie submittals.

1.2.1.2 COBie Guide

TR-07-30 Construction Operations Building Information Exchange (COBie) Requirements Definition and Pilot Implantation Standard (Aug 2007) (http://www.wbdg.org/pdfs/erdc_cerl_tr0730.pdf) clarifies and supersedes the minimum quality standards for COBie submittals found in the buildingSMART COBie Guide. Unless otherwise defined in the USACE Appendix classifications required in any COBie submission shall utilize OMNICLASS.

1.2.1.3 COBie Data File - Facility Asset Scope

Provide one COBie-Specific Submittal Set for each facility identified in a project.

1.2.1.4 COBie Data File - Site Asset Scope

Provide one COBie-Specific Submittal Set for SITE assets, if SITE assets are used by multiple facilities.

1.2.1.5 COBie Data File - Reported Errors

Update all COBie Data files until zero errors are reported from the relevant COBie Tool Kit Quality Control Report.

1.2.1.6 COBie Data File - Reported Warnings

Document and submit, for Government Approval, the reason for warnings reported from the relevant COBie Tool Kit Quality Control Report.

1.2.1.7 COBie - Data File - Design Phase

Accurately reproduce all design drawing schedules in COBie-Specific Submittals. For products scheduled by Type, individually list each specific asset.

1.2.2 COBie-FORMATTED SUBMITTAL QUALITY

Meet the minimum quality standards for all COBie-Formatted Submittals as noted below.

1.2.2.1 COBie Templates

Utilize the COBie Tool Kit to produce templates for all COBie-Formatted Submittals. These templates are used to collect data for all COBie-Formatted Submittals.
1.2.2.2 COBie-Formatted Submittal Contents

Ensure that the information contained in the COBie-Formatted Submittals accurately reflects current state of the as-built project at the time of the submission.

1.2.3 COBie DATA FILE QUALITY

Ensure that location of all linked COBie in either COBie-Specific Submittals or COBie-Formatted Submittals conform to the following standards:

1.2.3.1 Document Files

Utilize PDF files for all document-based files. Create documents to be compatible with Adobe Acrobat Reader Version 6.0 and later. Provide files from original sources, text-searchable, and saved in "Standard" resolution.

1.2.3.2 Scanned Document Files Prohibition

Submittal of scanned or photocopied document files is prohibited. Only electronically marked-up manufacturer files are acceptable.

1.2.3.3 Photograph Files

Utilize JPEG files for all photograph and image files. A maximum resolution of 300 Pixels Per Inch/Dots Per Inch (PPI/DPI). Publish 5x7 photographs.

1.2.3.4 Drawing Files

Utilize both PDF and native design or shop drawing file format. Create PDF documents to be compatible with Adobe Acrobat Reader Version 6.0 and later. Produce files from original sources, text-searchable, and saved in "Standard" resolution.

1.2.3.5 File Linking

Link COBie Document Files and Photographs to the relevant records in the COBie Data File per COBie specification.

1.2.3.6 File Protection

Do not restrict COBie Data Files, Document Files or Photographic Files from being modified or copied.

1.2.3.7 Manufacturer-Specific Documents

Provide document files for each product family based on the manufacturer on-line documentation. Do not submit document files containing multiple product catalogs from the same manufacturer, or product data from multiple manufacturers.

1.2.3.8 Operations and Maintenance Manual Documents

To support the production of electronic Operations & Maintenance manuals, either (a) split single manufacturer files to ensure that the file contains information from a single product type and split specific manufacturers' product type specific files to ensure that the file contains information pertaining to a single submittal type or (b) provide electronic bookmarks.
1.3 INFORMATION DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery Method - COBie-Specific Submittals

Provide COBie-Specific Submittals electronically directed. Document this format in the COBie Information Delivery Plan. Specifically address the following minimum requirements in the COBie Information Delivery Plan.

1.3.2 Electronic Media

Provide data on either disk-based (CD or DVD), portable hard drive media or upload the Contractor Maintained Secure File Repository. Select and apply technology used for COBie electronic data transmission to ensure that the full data set is provided on one single "disk" or "drive." Document the selection of disk-based on drive-based media in the COBie Information Delivery Plan.

1.3.2.1 Disk-Based Media

If disk-based media are provide, then apply a printed label to the data disk and list the name of the project, project location, contract number, design firm or prime Contractor company's name, title of submission, and security classification of the data contained on the disk on the label. Also include on the label the name and contract information of the individual who produced the final data disk to insure that any problems with the data or media can be easily resolved.

1.3.2.2 Secure File Repository

If the Secure File Repository is used include a transmittal sheet that contains the name and contact information of the individual who produced the data to insure that any problems with the data or media may be easily resolved.

1.3.2.3 Drive-Based Media

If drive-based media are provided, then legibly label the drive content and date on the outside of the drive. Include the phrase "COBie DATA" and the appropriate contract or task order number. Also include the name and contact information of the individual who produced the final data disk to insure that any problems with the data or media may be easily resolved.

1.3.3 Transmission of Physical Media

When media is not hand-delivered by Contractor personnel, it shall be delivered using an accountable commercial delivery service. Provide the tracking number and request a return receipt acknowledging the Government office receiving the package. Wrap all Storage media within a separate envelope with full mailing address in case the exterior envelop is damaged.

1.3.4 Encryption

Encrypt COBie data as directed by Area/Resident/Project Office Engineer. Document the encryption to be used in the COBie Information Delivery Plan.
PART 2 PRODUCTS

2.1 COBie Tool Kit

The COBie Tool Kit software supports the preparation, testing, and submission of all COBie deliverables. The COBie tool kit is an add to Revit and can be found on the Autodesk website (http://www.autodesk.com/campaigns/interoperability). For full COBie submittals (COBie-Specific Submittals) the COBie Tool Kit provides the Design and Construction Quality Control Reports. For submittals that rely on the use and re-use of COBie information (COBie-Formatted Submittals, Installed Equipment Photographs) the COBie Tool Kit provides partially completed templates through which COBie data may be correctly captured in the field.

2.2 COMMERCIAL OFF-THE SHELF (COTS) SOFTWARE

A variety of COTS software systems have been tested against the COBie requirements. Document all software used in the COBie Information Delivery Plan.

2.3 APPLICATION

2.3.1 COBie Information Delivery Plan Application

Within 30 days following Notice to Proceed provide an Information Delivery Plan describing the roles and responsibilities, software and services that will be used to capture COBie data including, but not be limited to, the topics below:

2.3.1.1 COBie Quality Control Responsibility

Designate one individual and one alternate party responsible for the production of COBie submittals in accordance with this specification.

2.3.1.2 COBie Creation and Capture Responsibility

Prepare a table that identifies any party responsible for the creation and/or capture of each specific COBie data elements.

2.3.1.3 Request for Photography

Provide a scanned copy of the letter requesting allowance to take installed equipment photographs on this project. Include the documentation as to the Government action on that request.

2.3.1.4 COTS Software Selection

Identify each COTS software product used in the production of COBie submittals.

2.3.1.5 COBie Took Kit

Identify expected use of the COBie Took Kit for purposes of Quality Control, production of submittal templates, production of contractually required reports, and production of electronic O&M manuals. Use of an alternative COTS product requires a pre-approved substitution documented in the COBie Implementation Plan.
2.3.1.6 Authoritative Sources

Describe the way in which the selected COTS Software and/or COBie Took Kit are used to collect COBie data and provide that data in the appropriate COBie-Specific Submittals or COBie-Formatted Submittals.

2.3.1.7 Multiple Data Source Merging

Explicitly identify how the COTS Software and/or COBie Took Kit are used to capture COBie data without intermediate paper documents, manual data transcription, or manual copying of COBie data.

2.3.1.8 Manual Transcription Elimination

Explicitly identify how the COTS Software and/or COBie Took Kit are used to capture COBie data without intermediate paper documents, manual data transcription, or manual copying of COBie data.

2.3.1.9 Survey Elimination

Explicitly identify how the Manual Transcription Elimination described in the COBie Information Delivery Plan has been used to eliminate site survey data collection. COBie Implementation Plans that fail to directly address the elimination of a minimum of one job site survey shall be returned for revision.

2.3.1.10 Request to Eliminate Paper Manuals

If approved by the Government, COBie deliverables may be submitted in lieu of paper-based handover documents specified elsewhere in this contract. COBie Implementation Plan shall document the results of any request to eliminate paper-based handover documents.

2.3.2 COBie-Specific Submittal Set

Provide a complete set of files in each COBie-Specific Submittal Set as described below:

2.3.2.1 COBie Data File

Prove one COBie Data File with each COBie-Specific Submittal Set.

2.3.2.2 COBie Data File Quality Control Report

Provide one COBie Quality Control Report with each COBie-Specific Submittal Set. Select the COBie Tool Kit software (GOVERNMENT FURNISHED INFORMATION) Quality Control report for Design or Construction depending on the phase of the COBie Data File.

2.3.2.3 COBie Document Files

Create individual Portable Document Format (PDF) files for each approved submittal and link in the COBie Data File to the related facility information.

2.3.2.4 COBie Equipment Photographs

Provide photographs of installed equipment as of the data of submission of the COBie-Specific Submittal Set as specified by the COBie format.
Provide a minimum of two photographs for each piece of individually scheduled equipment identified on the Construction Documents' stage design drawings. Provide one photograph of the installed equipment prior to covering by insulation, walls, or ceilings. Provide one photograph clearly showing that equipment's nameplate.

2.3.3 COBie-Specific Submittal Application

Provide COBie-Specific Submittal Sets as described below, as documented in the COBie Information Delivery Plan:

2.3.3.1 Architectural Design Phase (60% Design Submittal)

Provide an Architectural Design Phase COBie file that contains the same information found on the design drawings submitted at this stage of the project. COBie contents at this stage are focused on room, room types, and finish schedules; and equipment such as plumbing and lighting fixtures found in the associated design drawings.

2.3.3.2 Horizontal Coordinated Design Phase (100% Unreviewed Design Submittal)

Provide a Coordinated Design Phase COBie file that contains the same information found on the design drawings submitted at this stage of the project.

2.3.3.3 Construction Documents Phase (100% Reviewed Design Submittal)

Provide a Construction Documents Phase COBie file that contains the same information found on the design drawings submitted at this stage of the project. COBie contents at this stage update the Horizontal Coordinated Design Phase COBie file and emphasize the completion of room finish and equipment schedules. Also provide the basis of design for all scheduled equipment types.

2.3.3.4 Construction 60% Fiscal Complete Phase

Provide a Construction 60% Fiscal Complete COBie file updated to reflect the current state of the project at this milestone. This COBie deliverable reflects all changes to COBie data resulting from executed modifications at the time of the submission of this file. The Information Delivery Plan discusses the re-use and updating of this COBie file as the basis for the delivery of subsequent COBie deliverables.

2.3.3.5 Beneficial Occupancy Phase

Provide a Beneficial Occupancy Phase COBie file updated to reflect the current state of the project at the time of Beneficial Occupancy. This COBie deliverable reflects all changes to COBie data resulting from executed modifications at the time of the submission of this file. Include COBie data needed to inform the facility manager of the maintenance activity conducted prior to Beneficial Occupancy. The Information Delivery Plan discusses the re-use and updating of this COBie file as the basis for the delivery of subsequent COBie deliverables.

2.3.3.6 Fiscal Completion Phase

Provide a Fiscal Completion Phase COBie file updated to reflect the current state of the project at this milestone. This COBie deliverable reflects all changes to COBie data resulting from executed modifications at the time of the submission of this file. The Information Delivery Plan discusses the re-use and updating of this COBie file as the basis for the delivery of subsequent COBie deliverables.
state of the projects at the time of Fiscal Completion. Include COBie data needed to inform the facility manager of the maintenance activity conducted between the previous COBie deliverable and this final COBie deliverable. This file must fully reflect the as-built conditions and include changes required to COBie data resulting from all contract amendments and modifications.

2.3.4 COBie-Formatted Submittal Application

Provide COBie-Formatted Submittal Sets as described below, as documented in the COBie Information Delivery Plan:

2.3.4.1 Approved Submittals

Prepare and submit monthly updated of all approved submittal line items. At a minimum provide the following information in COBie format: product type, specification section, document name, document type, document website location. Also provide a compressed, but legible, PDF of the approved submittal document. If the submittal document contains multiple sub-types of documents, split the file into documents each of a category (Single Purpose Files).

2.3.4.2 As-Installed Equipment Schedule

Submit monthly updates of installed equipment. Provide the following minimum information in COBie format: component name, installed manufacturer, installed model number, serial number, manufacturer's catalog reference number, room number from which equipment is operated, specification section and paragraph, installation date, and start-up date.

2.3.4.3 As-Installed Warranty Tags

Submit monthly updates of information provided on installed equipment tags. Provide the following minimum information in COBie format: product or material name, product type, manufacturer name, installed model number, serial number, responsible contractor contract information, warranty start date, warranty duration, warranty contact information, warranty response time priority code.

2.3.4.4 Spare Parts Schedule

Submit information on spare parts. Provide the following minimum information in COBie format: product type, manufacturer, model number, manufacturers part number, part name, minimum stock level, replacement ordering level, part supplier, supplier part number, and related manufacturer or commissioning agent documents.

2.3.4.5 Warranty Certificates and Data

Submit information on product warranties. Provide the following minimum information in COBie format: product type, manufacturer contact information, model number, suppliers contact information, warranty guarantors contact information, warranty description, durations warranty start date, expected warranty response time, and related manufacturer warranty certificate documents.

2.3.4.6 Preventative Maintenance Plans

Submit information on preventative maintenance. Provide the following
minimum information in COBie format: product type, manufacturer, model number, job name, job description, required tools, materials, and training, and related manufacturer or commissioning agent documentation.

2.3.4.7 Repair and Replacement Plans

Submit information on product and system troubleshooting, repair, and replacement. Provide the following minimum information in COBie format: product type, manufacturer, model number, job name, job description, required tools, materials, and training, and related manufacturer or commissioning agent documentation.

2.3.4.8 Operations and Maintenance Manuals

Submit two sets of electronic operations and maintenance manuals using the COBie Tool Kit "eBook" format. Update any documents to ensure that each manufacturer catalog is either split into individual files, or referenced by electronic bookmark and noted in the COBie Documents as a linked data file. The need to provide paper copies of this electronic set of O&M manuals will be determined by the Government and documented in the COBie Implementation Plan.

2.3.4.9 Interactive Floor Plan

If an as-built, building information model, in INDUSTRY FOUNDATION CLASS MODEL Coordination Model View format, is required elsewhere in this contract, produce an interactive floor plan module using the COBie Tool Kit "eBook" export.

2.3.4.10 Real Property Equipment

Provide all required deliverables of the DD 1354, "Transfer and Acceptance of Military Real Property," Form using COBie data as the basis for real property assets. Also provide a separate report of installed personal property.

2.3.4.11 Door Schedule

Submit information on installed doors. Provide the following minimum information in COBie format: door type, door number, door size, frame type, fire rating, door finish, operating room number, connecting room number.

2.3.4.12 Hardware Schedule

Submit information on installed hardware. Provide the following minimum information in COBie format: hardware set type, installed manufacturer, installed model number, manufacturer's catalog reference number, quantity used, size, finish, BHMA finish designation, fire rating, key control number.

2.3.4.13 Signage Schedule

Submit information on door/room signage. Provide the following minimum information in COBie Format: room number, signage type, signage text, signage inserts, symbol text, remarks.
2.3.4.14 Room Finish Schedule

At the beneficial occupancy and fiscal completion stage, submit, in COBie Format, an updated room schedule that identifies, at a minimum, the following set of information: updated room number, floor finish, ceiling finish, and wall finishes.

2.3.5 Installed Equipment Photograph Application

Submit a request to take photographs of installed equipment on the project. Following Government approval of this request, submit the minimum specified electronic photographs of installed equipment reported in the As-Installed Equipment Schedule in COBie Format. Additional photographs may be provided documenting the as-installed condition of equipment to be covered later by insulation, ceilings, floors, or partitions. Provide the set of all photographs as attachments to the monthly As-Installed Equipment Schedule. Provide the following minimum information in COBie format: component name, photograph name, date photograph was taken, description/notes regarding the job progress or condition.

PART 3 EXECUTION

3.1 APPLICATION

This section covers the requirements for the delivery of COBie files.

3.1.1 Architectural Design Phases (60% Design Submittal)

The Contractor shall be responsible for the production of the Architectural Design Phase COBie file containing all required COBie data as required in the Review and Approval section of this specification.

3.1.1.1 Contact Persons Worksheet

A minimum of one (1) record describing the person serving as the contact for this phase shall be provided by the contractor to the government.

3.1.1.2 Facility Worksheet

Only one (1) record shall be provided by the Contractor. If the Contractor is delivering COBie data on multiple buildings, then the Contractor shall provide the government one file for each individual building included in the contract.

3.1.1.3 Floor Worksheet

One record shall be provided by the Contractor for the building included in the contract. The Contractor’s COBie data for buildings must also include a minimum of one (1) record for the roof and one (1) record for the site.

3.1.1.4 Space Worksheet

The following minimum set of attribute data shall be provided by the contractor for each building space: floor finish, wall finish, ceiling finish.
3.1.1.5 Space Coordinates

The Contractor shall include a minimum of one ‘bounding box’ for each record in the Building Space attribute worksheet. Accurate identification of the ‘bounding box’ requires a consistent definition of the upper and lower corners of the building space. Building spaces defined in COBie shall not have gaps between adjacent spaces. Building spaces defined in COBie shall be defined to the centerline of walls.

3.1.1.6 Zone Worksheet

A minimum of one record for each named zone area shall be provided for the following zones:

1. Circulation Zone
2. Lighting Zone
3. Fire Alarm Zone
4. Historical Preservation Zone
5. Occupancy Zone
6. Ventilation Zone
7. Emergency Generator Zone
8. UPS Zone

3.1.1.7 Type Worksheet

One (1) record shall be prepared by the contractor for each type of scheduled architectural element listed in the design. Examples of such elements include, but are not limited to: doors and windows.

3.1.1.8 Component Worksheet

One (1) record shall be prepared by the contractor for each individual component named in any list of scheduled materials, products, and equipment as listed in the design. Examples of such components include, but are not limited to: doors, windows, light fixtures, and equipment schedules.

3.1.1.9 Space References for Doors and Windows

Architectural Component Worksheet records for interior doors and windows shall be identified as being in two building spaces. Component records for exterior doors and windows shall be identified as being in a single building space.

3.1.1.10 Identification of External Doors and Windows

In addition to identifying the space(s) related to doors and windows, every individual door and window shall have a corresponding record in the Attribute worksheet to identify if the door or window allows access outside the building. The name of the attribute used shall be "IsExternal". Internal doors and windows shall have an "IsExternal" value of zero (0). Internal doors and windows shall have an "IsExternal" value of one (1).

3.1.1.11 Information Not Required

Manufacturer, Model Number, and warranty data on Architectural Components shall not be required in the Architectural Design Phase COBie files.
3.1.2 Horizontal Coordinated Design Phase (100% Unreviewed Design Submittal)

The Contractor shall submit to the government an Architectural Design Phase COBie file that has been updated to reflect the current status of the project and includes the following additional information.

3.1.2.1 Zone Worksheet

Data for various system zones shall be provided by the contractor. If systems are decomposed in the design into smaller sub-systems, then data for the smaller sub-system levels shall be provided by the contractor. A minimum of one (1) record for each zone area listed below shall be provided by the contractor for the following zones:

1. Fire Protection Zones
2. Intrusion Detection Zones
3. HVAC Service Zones
4. Plumbing Service Zones
5. Electrical Service Zones

3.1.2.2 Type Worksheet

One (1) record shall be prepared by the contractor for each type of scheduled material, product, or equipment element listed in the design. All types of scheduled architectural, mechanical, electrical, and plumbing items shall be included in this Architectural Element Type Worksheet.

3.1.2.3 Component Worksheet

One (1) record shall be prepared by the contractor for each individual component named in any list of scheduled materials, products, and equipment as listed in the design. Examples of such components include, but are not limited to: all architectural elements, mechanical system equipment, plumbing fixtures, electrical lighting outlets and panel boards.

3.1.2.4 Information Not Required

Manufacturer, Model Number, and warranty data on Architectural Components shall not be required in the Design Phase COBie files.

3.1.2.5 Interim DD 1354 Report

The Contractor shall utilize the information provided in the COBie deliverable to prepare an Interim DD 1354 Report. This report shall be provided to the Government at the same time as the COBie deliverable for this phase.

3.1.3 Construction Documents Phase (100% Reviewed Design Submittal)

The Contractor shall submit to the government a Horizontal Coordinated Design Phase COBie file updated to reflect the current state of the project and the following additional information.

3.1.3.1 Building Spatial Assets

The Contractor shall update the following attributes for each Building Space in the COBie file. Attribute records shall be added to each Building Space record to provide the following information:
1. Building Space Gross Area
2. Building Space net Area
3. Building Space Floor Covering Type
4. Building Space Wall Covering Type
5. Building Space Ceiling Type

3.1.3.2 Architectural Component Worksheet

Information on the worksheet related to Manufacturer, Model Number, and warranty information shall not be required at the Vertical Construction (Full NTP) Documents Phase.

3.1.3.3 Replacement Price and Expected Service Life of Fixed Assets

The Contractor shall provide the estimated direct price of replacement and expected service life, as provided from the manufacturer, for all assets identified as fixed assets in the COBie Type worksheet.

3.1.3.4 Document Worksheet

The Contractor shall provide an electronic version of the current construction submittal register in the COBie Document worksheet. This requirement is in addition to the delivery of Contractor's SpecsIntact submittal register. The "Stage" selection in the COBie Documents worksheet shall be set to the value "Requirement."

3.1.3.5 Attribute Worksheet

The minimum set of properties required for all Type worksheet records shall be the properties found in the Specifiers’ Properties information exchange (SPie) specification. Contractors shall refer to the Product Guide of the Whole Building Design Guide to identify the minimum SPie properties that must appear for each record for Architecture Element Product Types.

3.1.3.6 Interim DD 1354 Report

The Contractor shall utilize the information provided in the COBie deliverable to prepare an Interim DD 1354 Report. This report shall be provided to the Government at the same time as the COBie deliverable for this phase.

3.1.4 Construction 60% Fiscal Complete Phase

The contractor shall submit to the government a Vertical Construction Documents Phase COBie file updated to reflect the current state of the project and the following additional information.

3.1.4.1 Subcontractor Contact Information

The contractor shall provide additional Contact Worksheet records for each subcontractor providing specific submittal documents under the contract. The contractor shall ensure that the corresponding subcontractor is listed as the contact for each submittal package.

3.1.4.2 Manufacturer Contact Information

Additional Contact Worksheet records shall be provided by the contractor for the manufacturers included in all approved submittals. The contractor shall ensure this contact information is referenced in the Manufacturer
column of the Type Worksheet.

3.1.4.3 Room Tag

If the contractor has installed room number signage in the building that differs from the signage data listed on the design drawings, then the contractor shall provide the updated room signage designations in the Space Worksheet.

3.1.4.4 Manufacturer Information in Type Worksheet

The contractor shall provide Manufacturer, Model Number, and warranty information on the Type worksheet for the Construction 60% complete phase COBie submission. The only exception to this requirement for manufacturer information shall be products, whose submittals have not yet been approved.

3.1.4.5 Installed material, Products and Equipment

For all installed material, products, and equipment identified in the Component Worksheet, the contractor shall: (i) verify the location of the item, (ii) provide serial number of the item if the item has a manufacturer’s name plate, (iii) provide a tag number if the item has been tagged during the construction process, (iv) identify installation date.

3.1.4.6 Government Furnished Products

The contractor shall document all Government Furnished materials, products, or equipment using the Type, Component, and System worksheets which require coordination with Contractor Furnished Items. If Government Furnished Products are not specified by the government, the Contractor may use generic representations of the products. If needed, the contractor shall scan manufacturer data to produce PDF files. Government provided manufacturer data on GFCI shall be listed in the Documents worksheet as “Approved” documents.

3.1.4.7 Bar Codes

The contractor shall include the code numbers of all Bar Coded items in the Component Worksheet.

3.1.4.8 Approved Submittals

All approved electronic submittal files shall be linked by the contractor to the Document worksheet. Approved documents shall be identified by the contractor by setting the “Stage” of the submittal to “Approved.” The contractor shall provide an electronic copy of all approved submittals in formats as specified previously in this specification.

3.1.4.9 Submittals Remaining to be Approved

All submittals not yet approved shall be listed in the Documents worksheet. These submittals shall be identified by setting the “Stage” of the submittal to “Required.”

3.1.4.10 Attribute Worksheet

The minimum set of properties required for all Type worksheet records shall be the properties found in the Specifiers’ Properties information exchange (SPie) specification. Contractors shall refer to the Product Guide of the
Whole Building Design Guide to identify the minimum SPie properties that must appear for each record for Architecture Element Product Types.

3.1.4.11 Interim DD 1354 Report

The Contractor shall utilize the information provided in the COBie deliverable to prepare an Interim DD 1354 Report. This report shall be provided to the Government at the same time as the COBie deliverable for this phase.

3.1.5 Beneficial Occupancy Phase

The contractor shall submit a COBie file containing the information required in the CONSTRUCTION 60% Fiscal Complete Phase updated to reflect the current state of the project and the following additional information.

3.1.5.1 Spatial Assets

The contractor shall update the following attributes for each Building Space in the Building Space and Attributes worksheet:

1. Building Space Gross Area
2. Building Space Net Area
3. Building Space Floor Covering Type
4. Building Space Wall Covering Type
5. Building Space Ceiling Type

3.1.5.2 Equipment Assets

The contractor shall identify the estimated replacement price of each type of material, product, and equipment listed in the Type Worksheet.

3.1.5.3 Parts and Warranty Contacts

The contractor shall list contact information for all replacement parts companies and warranty guarantors in the Contacts worksheet. Warranty Information Manufacturer parts and labor warranties are related to product types in COBie data files. If warranty terms for individual components differ from the warranty of the Type, then the contractor shall include Attribute records for all warranty data properties for individual components.

3.1.5.4 Replacement Parts

Replacement parts information may be included in COBie in one of two ways, depending on the type of information available from the product manufacturers.

3.1.5.5 Detailed parts Set

If the manufacturer provides an electronic catalog of replacement parts, then those parts shall be individually identified within the optional Set Number” and “Part Number” columns of the Spare worksheet.

3.1.5.6 Replacement parts Diagrams

If the manufacturer provides replacement parts information in document format, then the contractor shall identify the document in the Document worksheet and shall use the worksheet to identify the associated product
3.1.5.7 Operating Plans

The contractor shall provide the following plans for individual components, types of components, and systems in the Job worksheet.

3.1.5.8 Building Services Descriptions

If the data are provided by the manufacturer, then the contractor shall enter the operating instructions in the COBie Jobs worksheet. If the data are provided in document format, then these documents shall be linked to the COBie file through the Documents Worksheet. The following types of information shall be provided in these plans:

The contractor shall enter the operating instructions in the COBie Jobs worksheet. Where needed, the contractor shall extract operating plans from the documentation provided by manufacturers’ literature. Jobs for specific equipment and job type shall be listed either as a series of steps using Prior column, or listed in paragraph format in the Description column. The following types of information shall be provided in these plans:

3.1.5.9 Operator Prestart

The contractor shall include procedures required to install, set up, and prepare each system for use.

3.1.5.10 Startup, Shutdown, and Post-Shutdown Procedures

The contractor shall provide clear narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

3.1.5.11 Normal Operations

The contractor shall provide narrative descriptions of Normal Operating Procedures. The contractor shall include Control Diagrams with data to explain clearly the operation and control of systems and specific equipment.

3.1.5.12 Operator Service Requirements

The contractor shall include instructions for services recommended to be performed by the operator such as lubrication, adjustment, calibrations, inspection, and recording gage readings.

3.1.5.13 Operating Instructions

The contractor shall include specific instructions, procedures, and illustrations for operation of the installed Components and features of each Type and System.

3.1.5.14 Preventive Maintenance

The contractor shall include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair for the installed model and features of each system. The contractor shall include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.
3.1.5.15 Preventive Maintenance Schedules

If the data is provided by the manufacturer, then the contractor shall enter the operating instructions in the COBie Jobs worksheet. If the data is provided in document format, then these documents will be linked to the COBie file through the Documents Worksheet.

The contractor shall enter the Preventative Maintenance Schedules in the COBie Jobs worksheet. If needed, the contractor shall extract these schedules from manufacturer’s literature. Jobs for specific equipment and job type shall be listed as series of steps using Prior column, or shall be listed in paragraph format in the Description column.

3.1.5.16 Emergency Operations

The contractor shall include Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. The contractor shall include Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. The contractor shall provide guidance and procedures for emergency operation of all utility systems including required valve positions, valve locations and zones or portions of systems controlled.

Emergency Operations Schedules may be provided one of two ways. If the data are provided by the manufacturer, then the contractor shall enter the Emergency Operations in the COBie Jobs worksheet. If the data are provided in document format, then these documents will be linked to the COBie file through the Documents Worksheet.

The contractor shall enter the Preventative Maintenance Schedules in the COBie Jobs worksheet. Where needed, the contractor shall extract these emergency operations plans from manufacturers’ literature. Jobs for specific equipment and job type shall be listed either as a series of steps using Prior column, or listed in paragraph format in the Description column.

3.1.5.17 Troubleshooting Instructions

The contractor shall include Troubleshooting Instructions to support troubleshooting the likely potential failure modes of building systems. The contractor shall include Troubleshooting Instructions for the following minimum set of systems: Alarm Systems, Conveying Systems, Cooling Systems, Elevator Systems, Damping Systems, Emergency Power Generation Systems Fire Suppression Systems, Heating Systems, and Ventilation Systems.

Troubleshooting Instructions shall be provided one of two ways. If the data are provided by the manufacturer, then the contractor shall enter the Troubleshooting Instructions in the COBie Jobs worksheet. If the data are provided in document format, then these documents shall be linked to the COBie file through the Documents Worksheet.

The contractor shall enter the Troubleshooting Instructions in the COBie Jobs worksheet. Where needed, the contractor shall extract the Troubleshooting Instructions from manufacturer’s literature. Jobs for specific equipment and job type may be listed in either as series of steps using Prior column, listed in paragraph format in the Description column.
3.1.5.18 Safety Instructions

The contractor shall include specific Safety Instructions that describe the procedures needed to overcome hazards associated with operating, maintaining, repairing, or replacing any of the equipment or systems in the building.

3.1.5.19 Manufacturer Safety Instructions

Safety Instructions shall be provided one of two ways. If the data are provided by the manufacturer, then the contractor shall enter the Safety Instructions in the COBie Jobs worksheet. If the data are provided in document format, then these documents shall be linked to the COBie file through the Documents Worksheet.

3.1.5.20 Custom Safety Instructions

The contractor shall enter the Safety Instructions in the COBie Jobs worksheet. Where needed, the contractor shall extract the Safety Instructions from manufacturer’s literature. Jobs for specific equipment and job type may be listed in either as series of steps using Prior column, or listed in paragraph format in the Description column.

3.1.5.21 Final Approved Submittals and Documents

The contractor shall verify that all manufacturer literature, shop drawings, and other submittal documents have been provided as linked documents referenced in the COBie Documents Worksheet.

3.1.5.22 Building Space Coordinates

The contractor shall update the building space coordinates to reflect as-built conditions.

3.1.5.23 Products and Equipment Attributes

The contractor shall confirm that manufacturer’s product data attributes are referenced for all Type and Component Attributes. The minimum set of properties required for all Type worksheet records shall be the properties found in the Specifiers’ Properties information exchange (SPie) specification. Contractors shall refer to the Product Guide of the Whole Building Design Guide to identify the minimum SPie properties that must appear for each record for Architecture Element Product Types.

3.1.5.24 As-Built DD 1354 Report

The Contractor shall utilize the information provided in the COBie deliverable to prepare an As-Built DD 1354 Report. This report shall be provided to the Government at the same time as the COBie deliverable for this phase.

3.1.6 Fiscal Completion Phase

The contractor shall submit a COBie file containing the information required in the BENEFICIAL OCCUPANCY PHASE updated to reflect the state of the current project and the following additional information.
3.1.6.1 Final DD 1354 Report

The Contractor shall utilize the information provided in the COBie deliverable to prepare an Final DD 1354 Report. This report shall be provided to the Government at the same time as the COBie deliverable for this phase.

3.2 QUALITY CONTROL

The complete specification for COBie formatted files may be found on the Whole Building Design Guide COBie information page. Deliverables must comply to the complete set of COBie file requirements. The following sections identify some of the common checks that are performed during the evaluation of a COBie file. These are provided to highlight some of the required COBie file format checks performed.

3.2.1 Required Fields

Data shall be provided for all required data fields. Those data fields identified as required for the purpose of correctly transmitting the COBie file, but are not required as part of a specific project deliverable, shall contain the text “n/a”.

3.2.2 Unique Identifiers

Unique identifiers are required (email or name) on all records in all COBie worksheets, except Attributes and Coordinates where the name and applicable named object taken together shall be unique. The Contractor shall ensure that unique COBie names are provided on all records to ensure compatibility between COBie information and design information. If unique names must be added or modified for COBie compliance, then the Contractor shall update the design documents to reflect these new or modified unique names.

3.2.3 Reserved Characters

Unique identifiers shall not contain commas, spaces, nor non-printing characters. Underscores should be used in lieu of spaces when needed to create unique identifiers.

3.2.4 Internal References

Specific fields in COBie worksheets contain the names of records on previous worksheets. All such references to previous worksheet must correctly reference prior worksheet name information. Personnel Contacts Persons and Companies that are required to be identified shall be identified by valid email addresses. All contacts shall have full contact information as previously defined.

3.2.5 Document References

COBie files reference documents such as product data sheets, shop drawings, and other document-based information. Such files must be included on the provided storage media. The COBie file must correctly identify the location, name, and file name of all documents.

-- End of Section --
PART 1 GENERAL

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-- End of Section Table of Contents --
PART 1  GENERAL

Attachments:
   Modifications and Title Block Examples

1.1  DEFINITIONS

The definitions listed below form a part of this specification.

1.1.1  Red-Line Drawings

Accepted design drawings marked-up during construction to show actual work performed to include necessary sketches, modification drawings, shop drawings and notes.

1.1.2  As-Built Drawings

Electronic CAD files developed from the accepted design drawings that include all of the information from the redline drawings and suitable for half-size reproduction. Building Information Modeling (BIM) files are considered a part of As-Built Drawings.

1.1.3  Black-Line Drawings

Paper drawings reproduced from electronic CAD files or high quality reproducible drawings.

1.1.4  Full-Size Drawings

22 inches x 34 inches nominal size drawings with all details visually readable so that half-size plot will fit on 11 inches x 17 inches cut sheets.

1.1.5  Modification Circle

A circle with a horizontal line through the center to identify modification changes on the drawings. The top half will contain the letter "R" with the bottom half containing the Modification number, unless directed otherwise. The lettering standard will be 1/8-inch Arial.ttf.

1.1.6  Electronic CAD Files

Electronic CAD files in Autodesk (.dwg) and Revit (.rvt) in accordance with appropriate CAD standard. The CAD standard will include level on/off status, special characters, line weights, font, and size requirements.

1.1.7  Accepted Design Drawings

Design drawings created by the design-build contractor for the construction phase of the contract that have been reviewed and accepted by the Government.
1.1.8 LEED


1.1.9 Building Information Modeling (BIM) Files

Electronic files that model the project design as a 3D graphics that produce accurate construction documents as detailed in the available BIM Model.

1.1.10 Geodetic Datum

The geodetic datum is a set of constants specifying the coordinate system used for geodetic control for calculating coordinates of points on the earth. The horizontal control datum is North American Datum of 1983 (NAD 83) based on a geocentric origin and the Geodetic Reference System of 1980. The vertical control datum is the North American Vertical Datum of 1988.

1.1.11 State Plane Coordinate System (SPCS)

This project is based upon the Colorado State Plane Coordinate System of 83). The SPCS is used so that a Cartesian coordinate system can be used in lieu of a spherical coordinate system. Use the meridians and base lines as well as the origin coordinates based on the Colorado surveying standards.

1.2 REFERENCES

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-1-2909 (2012) Geospatial Data and Systems

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data
50 Percent Preliminary As-Built Drawings; G-DO
100 Percent Preliminary As-Built Drawings; G-DO

SD-11 Closeout Submittals
Final As-Built Drawings; G-DO
LEED Documentation; G-RO
1.4 GENERAL REQUIREMENTS

1.4.1 As-built Drawings

The Contractor shall create electronic CAD files in Autodesk (.dwg), BIM Revit (.rvt) files for Building drawings, and full-size Red-Line Drawings showing As-Built conditions. The as-built Building BIM model shall be provided a LOD 400 with sufficient detail to both construction and describe As-Built conditions with data. This project utilizes the National CAD Standards ERDC/ITL TR-12-6 USACE A/E/C CAD Standards which are to be used on the As-Built drawings. The Contractor shall be responsible for obtaining the National CAD Standards in effect at time of Contract award. The National CAD Standards are available at: https://cadbimcenter.erdc.dren.mil/default.aspx?p=a&t (New users will be required to register. See "New User Registration" at the website indicated above.)

The Contractor shall be responsible for obtaining the required CAD software and BIM software for their own use. The Contractor shall not convert electronic drawing files from one software language to another. The transmittal requirements for the As-built Drawings shall be shown as activities on the Contractor prepared project schedule.

All changes from the accepted design drawings shall be shown on the as-builts. All changes shall be accurately and neatly recorded on the As-built drawings using the same symbols, terminology, and general quality as the original set of accepted design drawings. All changes shall be shown on all drawings that are affected by the change. Changes include: actual work performed, deviations resulting from Government responses to Requests for Information or Serial letters, surveys, shop drawings, descriptive changes, sketch changes, and modifications to the contract. Systems designed or enhanced by the Contractor such as HVAC control system, fire alarm system fire sprinkler system, and irrigation sprinkler system, shall shown on the As-built drawings. Where accepted design drawings or specifications allow for options, only the option selected and actually constructed shall be shown on the As-Built Drawings.

1.4.2 Red-Line Drawings

Red-Line Drawings shall be updated throughout the construction phase of a contract showing all changes that will be shown on the final as-builts. All as-built conditions shall be on the Red-Line Drawings within two (2) days after the work activity is completed or shall be entered on the deficiency tracking system (see Section 01 45 00 10, QUALITY CONTROL). If the red-line drawings are not being updated, incomplete, or inaccurate, the Contractor shall be considered to not be making satisfactory progress and funds will be withheld from the progress payments.

The Contractor shall have the option to do red-line drawings in either a hardcopy format or an electronic format unless the COR does not wish to do the As-Built drawings electronically, in which case the Contractor shall do the hardcopy option for the completion of Red-line Drawings.

1.4.2.1 Hardcopy Option

The Contractor shall keep two sets of updated red-line drawings available on the job site at all times. Changes shall be shown through updating details and notes. All changes shall be made accurately, neatly, and legibly as they occur. Mark up the hard copies of the red-line drawings,
including details and notes, with the following colored ink:

(1) Deletions - red
(2) Additions - green
(3) Special information - blue

1.4.2.2 Electronic Option

The Contractor shall make electronic drawings available to the COR at all times through a Local Area Network (LAN) or Internet connection. The connection shall have a download transfer rate not less than 10 Megabit/second (~1.250 Megabytes/second) and an upload transfer rate of not less than 1 Megabit/second (~124 kilobytes/second) in order to facilitate the timely access of drawing files. The Contractor shall make backups of all the electronic drawings at the close of business on the final day of work each week on a durable digital media such as removable hard-drive, tape drive, or optical disk. Each weekly file system backup shall be preserved over the course of the project and not overwritten; with file folders or individual media labeled with the date of backup. The weekly backup media shall be stored in a fireproof and waterproof safe in a locked room of the Contractor's trailer. The Contractor must also provide the COR with a DVD containing updated PDF drawings on a monthly basis. All changes to the electronic drawings shall be shown with clouding and in accordance with ERDC/ITL TR-12-6.

1.4.3 GeoDataBase

The Contractor shall provide a DVD containing a SDSFIE/FGDC GeoReferenced personal GeoDataBase, in accordance with the requirements of this section and EM 1110-1-2909, unless otherwise directed by the Contracting Officer.

For all information outside of the building walls, such as contour lines, utility locations, and the actual building location, the Contractor shall provide a personal GeoDatabase in .mdb format using the latest version of Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE) as the database structure. Provide a shell database which will define the projection and database structure. The layering standards to be used are the SDSFIE standards. Typically, the development of this database is created with ESRI software, although there is other software that can be used. For all drawings within and including the exterior walls, the Contractor shall provide electronic drawings in Autodesk (.dwg)Revit (.rvt).

In addition, a short read-me file (Word format) shall be added to the DVD explaining the deliverable. This read-me file should include a description of the software used to create the data, projection, and include the attribute tables used.

1.4.4 LEED Documentation

All LEED documentation that was submitted in the USGBC templates and any other documentation which supports the templates and indicates compliance with related Federal Mandates shall be submitted once LEED is finalized. The LEED Accredited Professional (AP) for Design and the LEED AP for Construction shall download a copy of all approved Templates and supporting documents on to DVDs and provide a paper copy of the documentation. See Section 01 33 29 SUSTAINABILITY REPORTING for detailed requirements. All LEED documentation shall be submitted within 120 days after the final inspection. The LEED documentation shall be placed on two DVDs with one copy sent to the COR and one copy sent to the Omaha District Office (ATTN:
1.5 PAYMENT

In accordance with the clause "Payment Under Fixed - Price Construction Contracts", $35,000 or 1 percent of the present contract value, which ever is greater, up to $200,000 will be withheld from payment for the creation of As-Built Drawings until Final As-Built Drawings and GeoDatabase Files are delivered to and accepted by the COR. In addition, $75,000 shall be withheld for LEED documentation until LEED documentation has been submitted and approved.

1.6 CONTRACTOR PERFORMANCE RATING

The Government will evaluate the Contractor's performance in CPARS (Contractor Performance Assessment Reporting System) at intervals of no more than 365 days during the period of performance and complete the final evaluation within 120 days of completion of the project. The timeliness and quality of As-Built drawings submittals, Final As-built Drawings, Red-line drawings, LEED Documentation, and GeoDataBase Files will be an important factor in determining the assigned rating for the Schedule evaluation area. If the Contractor fails to submit complete and accurate Final As-Built Drawings and GeoDataBase Files within sixty (60) calendar days of turning the completed project over to the Using Service, this failure will be noted in the comments under the Schedule evaluation area and may result in a lower rating for this area. Repeated failure to submit correct and accurate As-Built drawings submittals, Final As-built Drawings, Red-line drawings, LEED Documentation, and GeoDataBase Files may also result in lower ratings for the Quality and Management evaluation areas. The Contractor shall receive an Unsatisfactory rating for LEED documentation if LEED documentation is not submitted within 120 days after the final inspection.

1.7 TRANSMITTAL OF AS-BUILT DRAWINGS

1.7.1 Optional As-built Drawings Sample

The Contractor has the option to submit a sample of preliminary as-built drawings to the Omaha District Office that will be reviewed for formatting purposes. This submittal shall include five (5) distinct sheets from the project set of drawings. This optional submittal shall be sent to the Omaha District Office (ATTN: Russell Matthews CENWO-CD-S-TS) and contain the following:

1. One (1) DVD containing the following for each sheet:
   a. Electronic CAD Files
   b. Individual full-size PDF Drawings
   c. One (1) Combined Set of full-size PDF Drawings with bookmarks for each sheet

1.7.2 50 Percent Preliminary As-Built Drawings

The 50 Percent Preliminary As-Built Drawings are to be submitted within ten (10) days after 50% physical completion unless otherwise directed by the COR. These drawings will be reviewed by the government for technical content and formatting requirements. The Electronic CAD Files shall include all changes up to the time 50 Percent Preliminary As-Built Drawings are furnished with "clounding" around the changes. All drawings contained in the complete project set of drawings plus any additional drawings shall
be submitted with the 50 Percent Preliminary As-Built Drawings. The 50 Percent Preliminary As-Built Drawings shall be submitted within ten days after unless otherwise directed by the COR. 50 Percent Preliminary As-Built Drawings shall include the following:

1. One (1) DVD to the Omaha District Office (ATTN: Russell Matthews CENWO-CD-S-TS) containing the following:
   a. Electronic CAD Files
   b. Individual full-size PDF Drawings
   c. Combined Set of full-size PDF Drawings with bookmarks for each sheet
2. One set of half-size black-line drawings to the COR

If a resubmittal is required, the contractor shall resubmit within fifteen days after receiving comments back from the government. If the contractor fails to submit the 50 Percent Preliminary As-Built Drawings by the specified time, the contractor shall be considered to not be making satisfactory progress on the project and funds will be withheld from the progress payments.

1.7.3 100 Percent Preliminary As-Built Drawings

The 100 Percent Preliminary As-Built Drawings include all changes to the drawings as specified. The 100 Percent Preliminary As-Built Drawings will be reviewed for technical content and formatting requirements. Within thirty (30) days after the final inspection, the Contractor shall submit 100 Percent Preliminary As-Built Drawings indicating all as-built changes with "clouding" on all of the project drawings. All drawings contained in the complete project set of drawings plus any additional drawings shall be submitted with the 100 Percent Preliminary As-Built Drawings. The COR may grant the Contractor additional time if the Contractor is making reasonable progress on the as-builts, in the sole judgement of the COR. The Contractor shall not submit the Final As-Built Drawings until the 100 Percent Preliminary As-Built Drawings are approved. 100 Percent Preliminary As-Built Drawings shall include the following:

1. One (1) DVD to the Omaha District Office (ATTN: Russell Matthews CENWO-CD-S-TS) containing the following:
   a. Electronic CAD Files
   b. Individual full-size PDF Drawings
   c. Combined Set of full-size PDF Drawings with bookmarks for each sheet
2. One (1) set of full-size black-line drawings to the COR
3. One (1) set of Red-line drawings to the COR for reviewing purposes (hardcopy option).

1.7.4 Final As-Built Drawings

The Contractor shall produce Final As-Built Drawings without "clouding". The Final As-Built Drawings shall include all changes shown on the 100 Percent Preliminary As-Built Drawings including any additional required changes. All drawings contained in the complete project set of drawings plus any additional drawings shall be submitted with the Final As-Built Drawings. The Final Drawings shall be submitted no later than ten days after the 100 Percent Preliminary As-Built Drawing submittal is approved. The COR may grant the Contractor additional time if the Contractor is making reasonable progress on the as-builts. The Contractor shall send the following documents to the COR:
1. Three DVDs containing the following:
   a. Electronic CAD Files
   b. Individual full-size PDF Drawings
   c. Combined Set of full-size PDF Drawings with bookmarks for each sheet
   d. GeoDatabase Files
2. All remaining Red-Line Drawings (hardcopy option)
3. One full-size of As-built drawings.

The Contractor shall also send the following to the Omaha District Office (ATTN: Russell Matthews CENWO-CD-S-TS):

1. One DVD containing the following:
   a. Electronic CAD Files
   b. Individual full-size PDF Drawings
   c. Combined Set of full-size PDF Drawings with bookmarks for each sheet
   d. GeoDatabase Files
2. One half-size set of black-line drawings.

All GeoDatabase files shall be under a folder titled "GeoDatabase".

1.8 AS-BUILT DRAWINGS FORMAT REQUIREMENTS

1.8.1 General Formatting

Preparation of As-built Drawings shall be in accordance with USACE A/E/C requirements and/or match the detail shown on the accepted design drawings. The drawings shall include all of the requirements below:

   a. The drawing index shall be updated when drawings are added.
   b. When opened, the view shall be zoomed to fit the border.
   c. All files shall reference a border supplied by the CAD/BIM Technology Center (https://cadbimcenter.erdc.dren.mil/) placed in the layout/sheet model at a scale of 1 at the location (0,0).
   d. All unnecessary information outside the border shall be deleted.
   e. All files shall be purged/compressed.
   f. All reference files shall be included and shall be 'Bound' (AutoCAD) or 'Attached' (Microstation) to the CADD files in which the files are referenced.
   g. All text shall use the Arial.ttf font.
   h. An ASCII text file shall be provided with the following information: the name and phone number of the person we need to contact if we have problems, and the version of the CAD software used to create and/or work on the drawings.
   i. Pen tables for plotting shall be supplied.
   j. Each sheet/design shall have its own file and file name with only one layout/sheet per design file.
   k. Half toning shall be accomplished by using the color 8 and setting the pen table to plot color 8 to half tone.
   l. The file name shall be the project code followed by the sheet identification number. The file name shall be included in the border on every sheet and shall match the name of the file on the DVD. The project code is BU77.
   m. The File number shall be included in the border on every sheet. The file number is AF178-04-01
   n. The cover sheet will have "Contract Award Set" changed to "As-Built Record Set" with month & year completed.
o. All preliminary as-builts and redlines shall show drawing changes by "clouding" the affected area in layer G-ANNO-REVS in the drawing file.

p. All submitted Electronic CAD Files and PDF drawings shall be under a folder labeled "As-Built" on the submitted DVD.

q. Both the DVD case and DVD shall contain the name of the project, location, project code, solicitation number, contract number, and words detailing which submittal it is. The Final As-builts Drawings should be titled "As-Built Record Set".

r. Do not use zipped or compressed folders on any of the As-built submittals.

s. On the cover sheet add or revise text to read "This folio includes all reissued and descriptive amendments, RFIs, and modifications."

t. The Electronic CAD files and PDF drawings shall be in separate folders on each DVD.

1.8.2 Title Block

All information in the title block shall be filled in and correct. The title block shall also include all of the requirements below.

a. "RECORD DRAWING" text shall be added below the title block on the right side of the drawing on all sheets.

b. The date to be added in the revision box for modifications is found in Block 3 of Form SF-30.

c. The top line of the revision box shall state "REVISED TO SHOW AS-BUILT CONDITIONS" and dated. Use a "-" for the "Symbol."

d. The date box shall have the month and year as-builts were completed.

e. The approved box shall have the initials RJM.

f. The contract number and the solicitation number (if available) shall be shown on all sheets.

f. Additional word abbreviations, not found on the abbreviation sheet but necessary to describe the work, shall be properly identified and incorporated with the other standard word abbreviations.

g. Modifications should be properly noted in the title block in accordance with paragraph "Modification Changes" below.

1.8.3 Modification Changes

All modification changes shall be included on the as-built drawings. Modification changes at a minimum shall include all revised and reissued sheets, descriptive changes, sketches, etc. Any modification change that also affects other sheets other than the one referenced with the modification shall also be changed as appropriate. Typically, modification changes can be done by following the descriptive change included with the modification, but may require additional effort depending on the change and level of detail of the modification change. Modifications shall be posted in accordance with the following.

a. Follow directions in the modification for posting all changes.

b. All modifications to the contract shall be posted in chronological order.

c. The last modification number completed on the sheet should be shown with the modification circle in the top right corner of the "Project Title" and "Project Location" box.

d. All modifications to all plans, sections, or details, shall have a modification number placed in the revision box under column entitled "Symbol. The statement "GENERAL REVISIONS" may be used when applicable.

e. The Modification Circle size shall be 1/2-inch diameter unless the
area where circle is to be placed is crowded. Use smaller size circle for crowded areas.
f. A Modification Circle shall be place at the location of each deletion.
g. For all new details or sections that are added to a drawing, place a Modification Circle by the detail or section title.
h. For changes to a drawing, place a Modification Circle by the title of the affected plan, section or detail titles (each location).
i. For changes to schedules on drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

1.8.4 Legends

Symbols, which conflict with those on the original accepted design legend sheet, shall not be used. Additional symbols, necessary to depict any additional work items, shall be properly identified and added to the legend sheet or supplemental legend. Those projects that do not have legend sheets may use supplemental legends on each sheet where symbol is shown.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make revisions to, and maintain, the red-line and as-built drawings to the same level of detail as shown on the original Accepted design drawings. The Contractor shall provide any additional full-size drawings as required to display all details. In addition, the GeoDatabase Files shall be prepared as specified above and submitted in conjunction with the As-Built drawings.

3.2 SITE WORK

3.2.1 Utilities

The as-built drawings shall show all utilities whether active or abandoned, and will include all those shown on the original accepted design drawings or found on-site. The type of utility, location, general direction, size, material make-up and depth shall be shown. The location and description of any utility line or other installations of any kind known to exist within the construction area shall be shown. The location shall include dimensions to permanent features. All new underground utility lines (including electrical power and communications, gas, water, sanitary sewer, storm drains, roof drains and culverts) shall be located during installation. The Contractor shall survey pipe invert of gas, water, sanitary sewer, storm drains, roof drains and culverts and top of duct bank of electrical power and communications lines and associated fixtures (valves, manholes, test points, meters, cathodic protection points, tanks, ground points, and all point features along the new utility lines). Storm drains and sanitary sewer lines shall be surveyed where pipes enter manholes and inlets and at 100-foot maximum intervals along the line. The invert of all cleanouts and tees shall be surveyed. Inverts at each end of culverts shall be surveyed. Electrical power, communications, gas and water lines shall be surveyed at all manholes, tees, valves, corners, changes in direction and at intervals along the line which will accurately depict the location of the line in both horizontal and vertical directions (50-foot maximum interval). The horizontal and vertical accuracy shall be that 100% of the points are + 0.25' of their absolute position. New
underground utility lines shall be shown as 3-dimensional elements in a Autodesk.dwg file.

3.2.2 Structures

Structures above and below ground shall be shown. The size, material make-up, location, height, and/or depth shall be shown. Manholes shall show rim elevation and invert elevations as applicable. Power poles shall show electrical equipment, guy wires, and voltage rating.

3.2.3 Grades

Grade or alignment of roads, structures, or utilities shall be corrected if any changes were made from the contract drawings. Elevations shall be corrected if changes were made in site grading. If any grades are finalized outside of the respective grades tolerances, that new grade shall be shown on the as-builts.

3.3 STRUCTURAL

3.3.1 Steel/Concrete

Shop drawings that deviate from the accepted design drawings shall be incorporated in the As-Built Drawings.

3.4 MECHANICAL

3.4.1 Ductwork

Ductwork shall be shown to reflect actual installation and duct size. Ductwork routing changes shall be shown.

3.4.2 Plumbing

Piping and fixtures shall be shown to reflect the type of material, size and the route or location.

3.5 ELECTRICAL

3.5.1 PANELS

All accepted design drawing panel schedules shall be revised to show as-built conditions. Home-run circuit designation on electrical drawings shall accurately correspond to the as-built panel schedules.

3.5.2 Controls

All control diagrams in accepted design drawings shall be revised to reflect as-built conditions, and setpoints.

3.6 CONTRACTOR SHOP DRAWINGS

Contractor shop drawings, which supersede data on the accepted design plans and/or additional drawings, prepared by the Contractor, shall be incorporated into the As-Built Drawings. Design plans prepared by the Contractor shall include the designer's name on the As-Built Drawings.
**TITLE BLOCK INFORMATION KEY**

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<thead>
<tr>
<th><strong>DATE:</strong></th>
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<td>NEW DRAWING ADDED 05-23-2013</td>
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<td><strong>R-2:</strong></td>
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PART 1 SUMMARY OF WORK

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 1-200-01 (2016) DoD Building Code (General Building Requirements)

UFC 3-600-01 (2016; with Change 1) Fire Protection Engineering for Facilities

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)


INTERNATIONAL CODE COUNCIL (ICC)


NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)


U.S. AIR FORCE (USAF)

AF ETL 11-18 (2014) Small Arms Range Design and Construction

AF FC 4-179-03F (2015) Air Force Indoor Small Arms Firing Range

1.2 PROJECT DESCRIPTION

1.2.1 Function of Facility

This project, at Buckley AFB, Colorado consists of the design and construction of a new Small Arms Indoor Firing Range facility, along with the demolition and remediation of an existing indoor firing range.
The purpose of the Small Arms Range Complex at Buckley AFB, CO, is to replace the existing 1980s vintage firing range with a new firing range. The existing range is currently separate from existing classroom facilities and arms storage, and has both an airfield waiver and a Risk Assessment Code of 2 due to health concerns from lead exposure and contamination. In addition to health concerns that limit operating time on the existing range, the existing range is too small to accommodate standard class sizes.

The new range will have both an indoor range component along with an attached Combat Arms Training and Maintenance Facility (CATM) component. The CATM component will provide instructor offices, a break room, a queuing room, a classroom, weapons maintenance and cleaning areas, an alarmed weapons and ammunition storage vault, an arms issue room, restrooms, and a simulator room. Some of these functions may be combined into single rooms or moved to separate rooms depending on whether Bid Options are awarded. The range component will include the firing range, a range supplies room, and a control booth. The facility will also include standard utility spaces. The project includes site improvements, site utilities, and new pavement. New communications, mechanical, electrical, and fire protection systems will need to be installed. Provide a new fire sprinkler, fire alarm, and mass notification system for the building. The facility shall meet life safety, anti-terrorism/force protection (ATFP), and accessibility requirements.

1.2.2 Project Site

The project is located along the west side of South Snowmass Street, at the far northeastern corner of Buckley AFB, CO. Vicinity and location maps can be found in the drawings provided with this RFP.

This project includes extensive site work including new site grading, storm drainage piping and detention, pavement, ATFP improvements, new parking and new sidewalks. The site designer shall calculate the entire drainage area for the site and any offsite drainage that could impact the building and future site usage. The site design shall incorporate sloping the grade away from the building foundation, as per the ODDG.

1.2.3 Building Arrangement

The building shall be arranged as shown on the drawings provided in this RFP. This arrangement has been arrived at after consultation with the end user and has been determined as the best way to meet the functional needs of the client, in addition to meeting necessary code requirements. However, other design solutions which slightly modify the furnished solutions may be acceptable, and will be reviewed on their design merits against the furnished criteria, subject to Government approval.

1.3 GOALS AND OBJECTIVES

The existing Buckley AFB firing range has health and functional issues that bring it out of compliance with current Air Force firing range standards. The primary goal of this project is to provide a new facility which meets current small arms firing range criteria, as well as co-locating other training activities in one facility. Another goal is to demolish and remediate the current lead contaminated firing range site.

The new facility, while deviating from the Standard Design floor plan, incorporates the functional spaces and functional requirements of the
standard design floor plan for this facility type, as well as base and facility functional and aesthetic criteria. Deviations from the original standard design were done to reduce overall facility square footage and create a more functional layout. The functional requirements of the individual spaces of the original standard design shall be maintained.

1.3.1 Functional Objectives

This project will provide a facility sufficient to efficiently accomplish the Buckley AFB security forces unit's operational missions.

1.3.2 Codes and Criteria

All pertinent building codes and Life Safety codes in place at the time of the Design-Build Contract Award date shall be met or exceeded. The following codes shall be used as modified by UFC 1-200-01 General Building Requirements and any other relevant UFCs below as well as AF ETL 11-18 and AF PC 4-179-03F.

International Building Code (ICC IBC): Note that all references in the IBC to the International Electrical Code shall be considered to be references to NFPA 70. All references to the International Fuel Gas Code shall be considered to be references to NFPA 54 and NFPA 58. References to the International Fire Code and ICC IBC Chapter 9 shall be considered references to the UFC 3-600-01. Do not use ICC IBC Chapter 11.

International Mechanical Code (ICC IMC): Note that all references in the ICC IMC to "Heating and Cooling Load Calculations" shall follow ASHRAE 90.1 - IP. References to "Ventilation" shall follow ASHRAE 62.1.

International Plumbing Code (ICC IPC): Note that plumbing fixtures shall be provided in the quantities and locations as indicated on the provided RFP plans

1.3.3 Building Durability

Materials and equipment will be chosen for their durability and minimum maintenance. The building design shall conserve natural and manmade resources, and energy usage.

1.3.4 Changes to RFP Criteria Requirements

This Request for Proposal provides requirements expected of the Design-Build Contractor during the design and construction of this project.

The RFP drawings present an overall design concept of the project; provide useful project information; establish some definition of the systems to be used; and incorporate requirements expected by the Using Service.

It shall be the responsibility of the Design-Build Contractor to assemble the best-value-priced construction systems for this project that meet or exceed the design criteria set forth herein.

Offerors should not consider changes to RFP criteria requirements during proposal preparation. After contract award, any changes to the RFP criteria requirements require approval by the Contracting Officer.

See Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES for additional requirements.
1.3.5 Phasing of Work, Security, and Construction Staging

The existing firing range must remain in operation until the new Small Arms Range Complex facility is ready to be turned over to the Government or occupied by the user, and demolition work of the existing facility cannot proceed before this point.

The Contractor shall maintain a construction area fence throughout the duration of the contract. See Section 01 89 00 for additional information. The arms vault must be accessible for construction review from both the exterior and interior of the vault prior to covering the vault with furring walls and adjacent construction that may hinder examination of the vault. The contractor shall coordinate with the COR, who in turn will work with the base Civil Engineering Squadron (CES) and base security component for additional security requirements.

See drawings for construction staging areas.

1.4 SUSTAINABLE DESIGN REQUIREMENTS

This facility meets the Minimum Project Requirements (MPR) requirements for USGBC as a facility new construction project and is required to go through the full USGBC/LEED certification process. The Contractor shall design and construct a project that attains USGBC certification at the required "Silver" level.

Included with this RFP is a preliminary LEED checklist which has been prepared specifically for this project. See 01 33 29 SUSTAINABILITY REPORTING for additional requirements. At a minimum, the project must meet all LEED Prerequisites and those credits identified with a "Y" in the first column. Meeting these criteria alone is not sufficient enough to be eligible for Certification. The Contractor shall select additional credits which they wish to pursue from the optional credits identified with a "? or Maybe" in the second column. The remaining credits have been intentionally excluded from consideration for this project and should only be considered for inclusion after significant discussion with the Government and approval by the Contracting Officer. The project is currently registered on LEED Online as a LEED Version 3 project.

The A-E shall coordinate with the Omaha District LEED coordinator and provide him with "Project Team Manager" role. Current District LEED Coordinator is Brian Nohr (402)995-2172. Upon certification of the project the contractor's LEED AP shall transfer project LEED Directory administrations rights to Brian Nohr.

See 01 82 00 ARCHITECTURAL REQUIREMENTS for air barrier requirements.

1.5 FACILITY TYPE AND SIZE

1.5.1 Facility Type

The Small Arms Range Complex requires the demolition of an existing firing range, which is approximately 19,000 Square Feet (SF). The new facility has a max allowable gross square footage of 23,239 SF. The new facility is classified as an Air Force Indoor Small Arms Firing Range facility, and follows the standard design criteria for that facility type.
1.6       BASE BID AND BID OPTIONS

1.6.1      Base Bid

The bid includes the design and construction of the complete and usable
Small Arms Range Complex facility, along with demolition of the existing
firing range as described in all sections of these specifications,
appendices and drawings.

1.6.2      Bid Options

Bid Options are summarized here. See discipline specific requirements
sections and drawings for additional information.

1.6.2.1    Bid Option - Alternate Floor Plan

In lieu of the Base Bid drawings, construct the Small Arms Range Complex
per the drawings labeled "Bid Option."

1.6.2.2    Bid Option - Demolish Existing Bullet Trap

In lieu of leaving the existing bullet trap in place, demolish the existing
bullet trap at the existing firing range facility to be demolished

1.6.2.3    Bid Option - Ledgestone Wainscot

In lieu of concrete finish, provide Ledgestone Wainscoting on the base bid
floor plan.

1.6.2.4    Bid Option - Alternate Window Treatment

In lieu of providing horizontal blinds, provide roller window shades.

1.6.2.5    Bid Option - Additional Parking Stalls

Provide an additional 13 parking stalls to the base bid parking lot.

1.7       DRAWINGS

Drawings of the site plans, floor plans, and elevations are included for
use in developing this design.

1.8       OPERATION AND MAINTENANCE REQUIREMENTS

1.8.1      Operation and Maintenance Manuals

The intent of the O&M Manuals are to promote and maximize the efficiency,
economy, safety, and effectiveness of the life cycle operation,
maintenance, and repair of the facility. Operation and maintenance manuals
as required by the UFGS Technical Specifications (Divisions 2 thru 48) to
be edited by the contractor shall be provided.

1.9       DESIGN-BUILD CONTRACTOR REQUIRED A/E SERVICES

The following is a condensed summary of Section 01 33 00.32, "DESIGN AND
CONSTRUCTION DELIVERABLES/PROCEDURES" contained elsewhere in this
document. Refer to that Section for the full requirements.
1.9.1 Fast Track Packages

The contractor shall fast track the design and construction, that is, proceed with construction of parts of the sitework and facilities prior to completion of the overall design. A fast track package including site/civil, utilities, and foundation design is required. All other fast tracking packages are at the Contractor's discretion. 60% and 100% level reviews are still required with fast track packages, as described below. The Contractor may proceed with the construction work included in a separate design package after the Government has reviewed the final (100%) design submission for that package, review comments have been addressed and resolved to the Government's satisfaction and the Contracting Officer (or the Administrative Contracting Officer) has agreed that the design package may be released for construction.

1.9.2 Dimensions

Design, products, and construction for these projects shall be accomplished using English units of measurement. All measurement in the technical specifications sections shall be shown in English.

1.9.3 Professional Registrations, Licenses and/or Certifications

The award of contract will be made to one qualified contractual entity who will be responsible for design completion and the entire construction process for the facility. This contractual entity shall employ qualified building design professionals with appropriate professional registration, state licenses and/or certifications. Provide qualifications of the project's accredited LEED AP. The designer qualifications and experience shall be equal or better to that specified in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.9.4 Request For Proposal - Binding Information

The information contained in this RFP shall be considered binding unless specifically waived by the Contracting Officer. The successful offeror's proposal, along with any clarifications and best and final offers are a binding part of this contract. Site design, building design, architectural character and engineering/performance criteria shall be implemented through construction by the Contractor.

1.9.5 Evaluation of Systems

As part of the basic services, the Design-Build Contractor shall evaluate building systems and components for their possible inclusion into the design. If these systems and components meet the specified design, performance criteria in the RFP, and intent of the design, they may then be incorporated into the work.

1.9.6 Documents Requirements

For a more detailed list of design and construction submittals, see Section 01 33 00.32, DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES.

1.9.6.1 Design documents at all stages of design include:

- Construction drawings.
- Specifications
Design analysis narrative with calculations for all disciplines.

Sustainability and LEED Documentation, including LEED Checklist, Air Force Sustainability Requirements Scoresheet, Energy Summary, DA sustainability narrative, and related calculations and LCCA documents.

CD-Rom media.

1.9.6.2 Drawing requirements

All design drawings shall be accomplished using English measurement. Prepare 22" x 34" full-size drawings and half-size drawings in accordance with the Omaha District Design Guide.

The Contractor shall submit the design at various stages of completion, plus the final documents, for review and comment. These stages are:

- 60 percent design submittal
- 100 percent design submittal.
- 100 percent corrected final design.

1.9.6.3 60 Percent Design Requirements

Drawings, specifications, design analysis and calculations for all disciplines at an approximate 60 percent level of completion. Include sustainability documentation and energy model. See SECTION 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS for further detail.

1.9.6.4 100 Percent Design Requirements

Incorporate all comments from the 60 percent design submittal review. Drawings, specifications, design analysis and calculations for all disciplines at 100 percent level of completion. Include sustainability documentation and energy model. All aspects of the project are complete. See SECTION 01 33 00.38 100 PERCENT DESIGN REQUIREMENTS for further detail.

1.9.6.5 100 Percent Corrected Final Design

Incorporate comments from the 100 percent design submittal review.

1.10 COMMON DEFICIENCIES

Following are some common costly deficiencies to be avoided in the preparation of contract documents. Carefully compare the building design and contact documents with these requirements at several points in the design process to avoid unnecessary changes later.

- Not using correct abbreviations or terminology on the drawings. Abbreviations must match what is used on the standard abbreviation sheet, and terminology must match what is used in the UFGS guide specifications and Omaha District Design Guide.
- Not using the correct scales and north arrow designation, section cut system, or incomplete dimensioning on the drawings.
- Not providing sufficient space for door operation hardware at doors which
swing into a wall running perpendicular to the opening. Four inches minimum is required between edge of door frame and perpendicular walls.

Not providing correct and complete Design Analysis information written in the present tense. The Design Analysis will be written following the format indicated in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES and Chapter 17 of the Omaha District Design Guide. A separate Fire Protection section in the Design Analysis, with input from all disciplines, is one area which is often overlooked and shall be included.

Not providing a structural stoop at exterior doors where the slab is at the same approximate elevation as the interior floor. The use of simple slabs on exterior grade leads to lifting of the slab in below-freezing temperatures, which interferes with the safe operation of the door.

Not correctly presenting or coordinating (to avoid interference) features of HVAC, Fire Protection, Noise Control, and Physical Security.

Not correctly referencing and cross referencing building sections, wall sections, details, etc.

Failure to read/use Technical Notes in the Guide Specifications.

Failure to coordinate all disciplines prior to submittal of projects for review.

Sealant details not identified by appropriate symbols that relate to full scale illustrations.

Improper use of fire-retardant wood. Fire-retardant wood is combustible; its use in buildings that are of noncombustible construction is extremely limited (see ICC IBC for the minor allowable uses). Because of the potential for severe degradation, fire retardant plywood shall not be used in a roof or roofing system, or in structural applications.

Incorrectly listing trade names in door hardware specifications in lieu of ANSI numbers and failure to correctly specify hardware finishes.

Control joints in CMU walls are not shown on both architectural and structural plans, or are inconsistent.

Failure to properly edit and tailor guide specifications. Failure to delete all publications from guide specifications which do not apply to the particular project.

North arrow is not oriented the same direction on all sheets (civil, site, architectural, etc.).

Failure to include air barrier drawings indicating overall extent of the air barrier, air barrier details, and specifications which clearly indicate intent of air barrier and the air barrier testing.

Failure to include adequate information in the Energy Model data and Energy Summary.

Failure to adequately characterize the soils on the site for each project feature.
1.11 HAZARDOUS MATERIALS INFORMATION

No hazardous materials is identified or expected in the new facility.

The Contractor shall inspect the existing building to determine building components that are impacted by the proposed work and shall survey these impacted building materials for the presence of any hazardous materials that require special handling and/or disposal. The design and construction of the project shall be in accordance with all applicable laws and regulations.

1.11.1 Lead-Based Paint Surveys

Available information regarding the presence of lead-based paint in the buildings is included in the attached Hazardous Material Survey. The Contractor shall review available information and verify existing conditions. If necessary, the Contractor shall conduct additional lead-based paint survey to identify any lead-based paint that will be impacted by project activities. Survey results shall be included in the Design Analysis. If lead-based paint is present in anticipated work areas and will be impacted by project activities, the Designer shall edit Section 02 83 13.00 20 LEAD IN CONSTRUCTION and shall include the section in the construction documents. Section 02 83 13.00 20 shall require proper procedures to protect workers from exposure to airborne lead during project activities and to ensure that lead-containing residue does not remain in the project area at the conclusion of the work. It is not anticipated that removal of lead-based paint from substrates prior to demolition of existing surfaces will be required. Construction shall be performed in accordance with this specification and applicable regulations.

1.11.2 Other Hazardous Materials

A walk-through survey shall be conducted to identify any building components (such as polychlorinated biphenyl (PCB)-containing light ballasts; DEHP-containing ballasts; items that may contain mercury such as fluorescent light tubes, high-intensity discharge lamps, and thermostats; chlorofluorocarbons (CFCs) in equipment such as air-conditioning units and drinking fountains; batteries; back-up generator oil and fluid, etc.) that may contain other hazardous materials and that are scheduled to be removed as part of the project. Survey results shall be included in the Design Analysis. Provide any additional design requirements regarding protection of workers and proper disposal of hazardous materials appropriate to the project work area and tasks. Specification sections that may be required include Section 02 84 16 HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY. Construction shall be performed in accordance with these specifications as required and applicable regulations.

PART 2 PRODUCTS

2.1 Not Used

PART 3 EXECUTION

3.1 Not Used

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ARCHITECTURAL REQUIREMENTS

PART 1   GENERAL

1.1   REFERENCES

The design publications listed below shall be used as sources of criteria for the architectural design. Where a date is not specified, the most current edition of the code or standard in effect as of the date of issue of this RFP shall be used as criteria for the design. The criteria from these sources may be supplemented but not supplanted, by applicable criteria contained in nationally recognized codes and standards.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

36 CFR 1191  Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 1-200-01  (2016) DoD Building Code (General Building Requirements)
UFC 1-200-02  (2016) High Performance and Sustainable Building Requirements
UFC 3-101-01  (2011; with Change 1) Architecture
UFC 3-120-01  (March 2014; Chg 2 October 2014) Design: Sign Standard
UFC 3-600-01  (2016; with Change 1) Fire Protection Engineering for Facilities
UFC 4-010-01  (2012; with Change 1) DoD Minimum Antiterrorism Standards for Buildings
UFC 4-215-01  (2014) Armories and Arms Rooms
FC 4-179-03F  (2015) Air Force Indoor Small Arms Firing Range

U.S. AIR FORCE (USAF)

AFMAN 32-1084  (2012) Facility Requirements
ETL 08-13  (2008) Incorporating Sustainable Design and Development (SDD) and Facility Energy Attributes in the
Air Force Construction Program

ETL 11-18 (2011) Small Arms Range Design and Construction


US ARMY CORPS OF ENGINEERS - OMAHA DISTRICT


BUCKLEY AFB, CO

PEP (2014) Buckley Air Force Base Facilities Excellence Plan

IDG (2013) Buckley Air Force Base Installation Development Plan

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7 (2010; Errata 2011; Supp 1 2013) Minimum Design Loads for Buildings and Other Structures

ASTM INTERNATIONAL (ASTM)

ASTM C 734 (2006) Low-Temperature Flexibility of Latex Sealants After Artificial Weathering

ASTM C 834 (2005) Latex Sealants

ASTM C 919 (2008) Use of Sealants in Acoustical Applications


AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)


ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI Qual Stds (8th Edition) AWI Quality Standards

FM GLOBAL (FM)


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1.2 FUNCTIONAL PLAN REQUIREMENTS

Meet all requirements as shown on architectural drawings and in this architectural Scope of Work. Room-specific requirements may be found in this Architectural Scope of Work.

1.2.1 Personnel and Security Requirements

There are currently no controlled access requirements for either sites or the existing firing range. The contractor shall coordinate with the COR for additional security requirements.

1.2.2 Space Allocation

The Small Arms Range Complex facility includes an open office and a private office, a break room, a queuing space, a laundry room, an arms vault, an issue room, a weapons cleaning room, a weapons maintenance room, a classroom, a weapons simulator room, an observation room, a range supplies room, a control room, and an arms range, along with associated support spaces.

Space allocation shall be as shown on the drawings. The maximum gross
square footage of the facility is 23,239 SF. Net square footage is somewhat flexible in most spaces, with adjustments being made as necessary to meet space functional requirements. The classroom and weapons simulator are the least flexible, with the firing range having no flexibility in reduction of critical dimensions and square footage below required firing range criteria. Utility areas such as mechanical and electrical rooms shall be sized appropriately for the equipment going into the building. Any necessary reduction or addition of square footage to the utility spaces shall be adjusted in the exterior covered areas so that total square footage come as close to, but not exceeding the 23,239 square feet as allotted to the project. Exterior building dimensions may be adjusted slightly but overall maximum gross square footage shall not be exceeded.

Any changes to the floor plan must be approved by the Corps of Engineers Omaha District Design Branch Architectural Section, and the contracting officer.

1.2.3   Functional Requirements - Base Bid

1.2.3.1   Demolition

Demolish the existing firing range facility. This facility shall not be demolished until the new Small Arms Range Complex facility has been occupied by the user. The existing firing range was constructed in the 1980s, originally as an outdoor range with a earth berm backstop, and was renovated in 2010 to turn it into a partially enclosed range. The current facility site has concrete sidewalls and back walls to prevent ricochets and misaimed shots from leaving the site, separating the range into a main portion with two wings. The berm is held away from the facility with a concrete retaining wall, providing space between the back wall of the range and the retaining wall. The center portion of the range has overhead steel structure and metal and plywood baffles to further prevent stray bullets from leaving the range. The range has a continuous steel bullet trap at the rear of the facility. The two wings of the range have no roofing, with wood timber columns and wood beams spanning between concrete walls. The wood columns sit on buried concrete foundations. The front of the firing range is enclosed in a metal framed structure with uninsulated metal wall and roof panels. The center range portion and the front of the range have concrete floor slabs, while the side wings have loose gravel and dirt. The bullet trap, which penetrates through the back wall of the facility, sits on an exterior concrete slab. The front portion has an interior wood frame control booth.

The contractor shall demolish the entire facility, excluding the retaining wall for the berm, the existing bullet trap and concrete slab immediately supporting the bullet trap. Chain link fencing runs into both sidewalls of the facility. This fencing shall remain, and after the facility has been demolished, new fencing connecting the existing fencing shall be erected along with a swinging access door.

The existing firing range is known to be contaminated with lead particulates from weapons firing activities. See the attached Hazardous Materials Survey. The contractor shall remediate the contaminated portions of the building and properly dispose of hazardous materials as a part of the demolition process. Contaminated soil that is disturbed as a part of the demolition process shall also be remediated. Care shall be taken to limit disturbance of the surrounding site during demolition activities to reduce the amount of soil required to be remediated.
For information only As-Built drawings of the existing firing range are included with this RFP.

1.2.3.2 New Construction

The contractor shall meet the minimum building envelope energy performance values of ASHRAE 90.1 - IP (2010). The contractor shall insulate the building as needed to meet these values. The contractor shall also meet the minimum energy reduction requirements as listed in Federal mandates.

Construct facility as shown on plans. All spaces shall comply with technical requirements of FC 4-179-03F, ETL 11-18, and Prototype Design standard drawings, except where modified by the technical requirements listed below and in the drawings.

Construct building canopies at the building entrances as shown on the RFP drawings.

Construct exterior aluminum sunshading devices at all windows.

The contractor shall procure and install a 2' high by 2' wide diamond shaped Fire Hazard 4 sign designed per the DoD Hazard Classification System. Locate this sign on the building so that it is visible approaching the main entrance to the facility and coordinate the location with the Base Fire Department.

Construct a VESTIBULE. This space shall have a recessed, drainable walk off mat running at least 10'-0" in the direction of travel. Walk off mat shall have heavy duty carpet tread inserts with 12 mil monofilament for extra abrasiveness. Construct new full glass doors at both pairs of doors for the VESTIBULE. Provide doors with kick plates.

Construct a JANITOR'S CLOSET. Provide JANITOR'S CLOSET with a solid wood door. Provide door with kick plate. Provide space with a utility sink, along with a floor drain. Provide stainless steel shelving with integrated mop holders.

Construct an OPEN OFFICE. Provide OPEN OFFICE with a solid wood door with a narrow lite. Provide door with kick plate. Install 2' by 2' single tier metal lockers as shown.

Construct a LAUNDRY. Provide LAUNDRY with a solid wood door. Provide door with kick plate. Provide space with connections and space for stand alone residential washer and dryer. Provide overhead cabinets above the washer and dryer.

Construct UNISEX TOILET rooms, and SHOWER room as shown. Provide spaces with solid wood doors. Provide doors with kick plates. Construct new wall mounted toilets. Construct new urinals. Accessible toilet compartments shall be installed with ABA compliant grab bars. Construct new lavatories. Provide new mirrors above the lavatories. Provide a mirror in each shower area. Install new shower. Shower surrounds and shower pan shall be solid surfacing material. Install electric hand dryers, at least one per restroom. Each restroom shall have ABA compliant fixtures in locations and quantities as required by ABA. Install ABA compliant permanently fixed locker benches as shown. Install 1' by 1' double tier metal lockers as shown. Provide showers with shower curtains and curtain rods. Provide each shower with an adjacent towel hook affixed to the wall. Provide toilet tissue dispensers in toilet compartments. Provide soap dispensers at...
lavatory locations.

Construct CORRIDORS as shown on drawings. Provide two water coolers as shown. At least one water cooler shall be ABA compliant. Provide water coolers with integral bottle fillers. Provide a building directory in the corridor in the vicinity of the VESTIBULE.

Construct a CLASSROOM. Provide space with hollow metal doors. Provide doors with kick plates. Each individual door leaf shall be 42" wide, for a total width of 7'-0". Provide space with wall mount and infrastructure for 75 inch TV as shown on drawings. Provide space for a 7'-0" x 7'-0" vehicle mount mockup. Provide a 3' x 2' tackboard along the plan north wall of the space. Provide two 3' x 2' markerboards with marker trays, one on either side of the TV. Provide CLASSROOM with upper and lower cabinets, a sink, and dedicated floor space for a full size residential style refrigerator. Provide minimum of 15 linear feet of counter space. Plumbing connections shall be provided for a coffee maker, sink, and refrigerator. New countertop shall be solid surfacing material. New sink shall be single bowl stainless steel, undermounted below countertop. The bowl shall be 33" wide minimum. Construct space with an adjustable wall mount and infrastructure for a projector for weapons simulator training. Projector will be controlled by computer at freestanding computer desk. Coordinate wall mount location with end user.

Construct STORAGE rooms. Provide spaces with hollow metal doors. Provide doors with kick plate.

Construct an OBSERVATION room. Provide space with a hollow metal door. Provide door with kick plate. Provide the space with one-way glass window units as shown.

Construct an ISSUE ROOM. Provide ISSUE ROOM with a hollow metal door. Provide door with kick plate. Provide space with wall mounted clearing barrel, along with a painted marked safety zone on the floor immediately surround the clearing barrel. Clearing barrel and markings shall be designed per AFMAN 31-229.

Construct an ARMS VAULT. Provide ARMS VAULT with a GSA-approved Class V vault door equipped with a day gate. Construct vault to comply with UFC 4-215-01, API 31-101, and AFMAN 32-1084. Provide space with an issue window. Provide a stainless steel counter at the window on the ISSUE ROOM side. Provide space with wall mounted clearing barrel designed per AFMAN 31-229. Sub-divide space with a full height wire mesh partition with lockable door. Caged area shall be for storing of ammunition. Provide space with arms storage racks. Coordinate rack storage size with COR.

Construct a STUDENT WEAPONS CLEANING room. Provide space with a hollow metal door. Provide door with kick plate. Provide space with a stainless steel shop sink and an emergency eyewash, along with necessary plumbing connections. Provide space with a continuous stainless steel U-shaped perimeter counter at standing height as shown on drawings. Provide plumbing connections for solvent parts cleaning machine.

Construct an ARMS RANGE. Space shall be constructed to comply with the applicable criteria of FC 4-179-03F, ETL 11-18, and Prototype Design standard drawings. Provide space with hollow metal doors. Provide doors with kick plates. This space is defined as a fully contained range. The space shall allow firing from standing, kneeling, prone, and barricade positions. Provide space with 14 firing lanes. Fully contained ranges shall
preclude any bullets from leaving the containment limits. Construct
overhead baffles with a minimum of 6 inches of horizontal overlap between
the trailing edge of any baffle and the leading edge of the next baffle
downrange. Baffles shall follow the prescriptive construction requirements
of paragraph 7.5 of ETL 11-18. Overhead baffles shall be constructed to
withstand rifle ammunition as listed in Table 3 of paragraph 7.5.5.2 of
ETL 11-18. Sidewalls running down the length of the range are required to
prevent direct fire from exiting the range, and shall comply with the
requirements of paragraph 7.5.6 of ETL 11-18. Construct sidewalls of 3500
psi concrete to withstand 7.62mm ammunition per Table 4 of ETL 11-18. Equip
ARMS RANGE 113 with a bullet trap system. Provide the space with an
adjustable stationary target system. Provide ARMS RANGE with preparation
work counters as shown on drawings. These work counters shall be located at
a height for standing work. The work counters shall be constructed of heavy
duty 304 type 18 gauge stainless steel. The work counters shall have angle
brackets as opposed to support legs, to provide an easily cleanable space
below the counters. Each lane shall be provided with position barricades
designed as shown on sheet A-112 of the Prototype Design standard drawings.
Provide 5'-0" clear space to sidewalls from outside edge of first and last
firing positions per ETL 11-18. Shared interior walls surrounding the ARMS
RANGE shall be insulated to meet the same R-values as the insulated
exterior walls.

Construct a CONTROL BOOTH. Space shall be constructed to comply with the
applicable criteria of FC 4-179-03F, ETL 11-18, and Prototype Design
standard drawings. Provide space with a hollow metal door. Provide door
with kick plate. Space shall have a range control system, capable of
controlling target retrieval system, range communication system, and
lighting. Provide continuous solid surfacing material countertop running
length of space. Provide storage casework at either end of the countertop
consisting of drawers. Provide a minimum of 9'-0" knee space between
drawers for chairs. Provide cable grommets at countertop for range control
system and telephone connection. The space shall be elevated so that the
finished floor is 2'-6" above the finished floor of the ARMS RANGE. Provide
space with access stair. Equip stairs with guardrails and handrails.
Provide space with vision windows allowing clear viewing of all firing
lanes.

Construct a RANGE SUPPLIES room. Provide space with hollow metal doors.
Provide doors with kick plates. Sub-divide space with a full height wire
mesh partition with lockable door, as shown on drawings. Provide floor
mounted rack storage with adjustable height wire mesh shelving as shown on
drawings. Provide room with a 6" wide by 4" high concrete curb around the
perimeter of the room with metal wall panels.

Construct a MECHANICAL room. Provide space with hollow metal doors. Provide
doors with kick plates. Provide space with an access ladder and roof hatch
for access to rooftop mechanical equipment.

Construct an ELECTRICAL room. Provide space with a hollow metal door.
Provide door with kick plate.

Construct a TELECOMMUNICATIONS room. Provide space with a hollow metal
door. Provide door with kick plate.

Permanently attach exterior signage on two faces of the building indicating
the assigned building number or address. Building number signage shall
conform to Buckley AFB signage standards. Coordinate locations with COR.
Construct an aluminum unit logo attached to the building as shown on drawings. Coordinate with COR for unit logo. Size logo, in coordination with COR, for legibility and aesthetics.

Construct a unit logo cast in to the wall panel on the front face of the building as shown on drawings. Coordinate with COR for unit logo. Size logo, in coordination with COR, for legibility and aesthetics.

1.2.4 Functional Requirements - Bid Options

1.2.4.1 Alternate Floor Plan

In lieu of the Base Bid drawings, construct the Small Arms Range Complex per the drawings labeled "Bid Option." Building and room requirements shall be as listed in the base bid, except as modified in this paragraph.

Construct a BREAK ROOM. The break room shall include upper and lower cabinets, a sink, and dedicated floor space for a full size residential style refrigerator and two vending machines. Provide minimum of 15 linear feet of counter space. Plumbing connections shall be provided for a coffee maker, sink, and refrigerator. The space shall be provided with a floor drain. New countertop shall be solid surfacing material. New sink shall be single bowl stainless steel, undermounted below countertop. The bowl shall be 33" wide minimum.

Construct a NCOIC OFFICE. Provide NCOIC OFFICE with a solid wood door. Provide door with kick plate.

Construct a QUEUING room. Provide wall mount for 42" flat panel TV as shown on drawings.

Construct a CLASSROOM. Provide space with hollow metal doors. Provide doors with kick plates. Each individual door leaf shall be 42" wide, for a total width of 7'-0". Provide space with wall mount and infrastructure for 75 inch TV as shown on drawings. Provide space for a 7'-0" x 7'-0" vehicle mount mockup. Provide a 3' x 2' tackboard along the plan north wall of the space. Provide two 3' x 2' markerboards with marker trays, one on either side of the TV.

Construct WEAPONS SIMULATOR rooms. Provide spaces with hollow metal doors. Provide doors with kick plates. Construct space with an adjustable wall mount and infrastructure for a projector. Projector will be controlled by computer at freestanding computer desk. Coordinate wall mount location with end user. Construct a folding panel partition wall separating WEAPONS SIMULATOR rooms as shown. Folding panel partition wall shall be manually operated. Folding panel partition shall be STC 50 rated to match adjacent construction. Construct wall pocket to house folding panel partitions when stowed.

Construct a STUDENT WEAPONS CLEANING room. Provide space with a hollow metal door. Provide door with kick plate. Provide space with a stainless steel shop sink and an emergency eyewash, along with necessary plumbing connections. Provide space with a continuous stainless steel U-shaped perimeter counter at standing height as shown on drawings.

Construct a WEAPONS MAINTENANCE SHOP. Provide space with a hollow metal door. Provide door with kick plate. Provide space with a stainless steel shop sink and an emergency eyewash, along with necessary plumbing connections. Provide plumbing connections for solvent parts cleaning.
1.2.4.2 Bid Option - Demolish Existing Bullet Trap

In lieu of leaving the existing bullet trap in place, demolish the existing bullet trap and supporting concrete slab at the existing firing range facility to be demolished.

1.2.4.3 Bid Option - Ledgestone Wainscot

In lieu of concrete finish, provide Ledgestone Wainscoting on the base bid floor plan as shown on drawing A-200. The base bid condition is concrete finish.

1.2.5 Structural Requirements

For structural design loads and conditions refer to Section 01 83 00 - STRUCTURAL REQUIREMENTS.

1.2.6 Room Finishes

See Room Finish Schedule on Architectural Drawings for Room Finish Information.

Provide ceramic tile wainscot surround at mop sink in the JANITOR room.

Install 3/4" fire rated plywood backerboards on at least one wall in the TELECOMMUNICATIONS room per requirements in COMMUNICATION REQUIREMENTS. Fire-rating stamps on plywood should not be covered.

1.2.7 Exterior Envelope

The exterior envelope shall primarily consist of structural insulated precast concrete wall panels, metal wall panels on steel structure, single ply membrane roofing, and a structural standing seam metal roof. Reference Architectural Drawings for locations of envelope materials.

1.2.8 Facility Services Design

The layout of the mechanical, electrical, and telecommunications spaces (rooms, allocated floor and wall spaces, and chases) are suggestive and may require wall and ceiling configurations to be slightly altered to conform to equipment requirements. Additional information regarding mechanical and electrical rooms of these facilities is described in further detail in their respective Sections.

1.2.8.1 Fire Protection

Fire separation walls and egress from the facilities shall meet or exceed the requirements of NFPA 101 - Life Safety Code. The facility shall be protected throughout by automatic fire sprinkler systems, except as modified by FC 4-179-03F and ETL 11-18. See Section 01 86 13 - FIRE PROTECTION REQUIREMENTS, as well as UFC 3-600-01 - DESIGN: FIRE PROTECTION ENGINEERING FOR FACILITIES. Provide semi-recessed fire extinguisher cabinets to comply with requirements of NFPA 10, including allowable travel distances. Fire extinguishers are not in contract.
1.3 GENERAL DESIGN REQUIREMENTS

1.3.1 Antiterrorism/Force Protection

This building shall include design provisions meeting the requirements of UFC 4-010-01 - DoD MINIMUM ANTITERRORISM STANDARD FOR BUILDINGS. This includes, but is not limited to, glazing and blast resistance requirements; visual screening; HVAC intake louver locations; and other protective features as outlined in the UFC. In addition, all design and construction work in this project shall comply with the antiterrorism/force protection requirements of Buckley AFB. Coordinate with the COR for these requirements.

1.3.2 Desired Image and Architectural Compatibility

The facility shall be compatible with Buckley AFB's aesthetic requirements as listed in the Buckley AFB FEP and IDG. Coordinate with the COR for approval of material aesthetics. Exterior ledgestone finish shall be approved by Buckley AFB through the COR.

1.3.3 Air Barrier

An air barrier shall be installed following the requirements in UFC 1-200-02 and UFC 3-101-01. Air barrier specifications 07 27 10.00 and 07 05 23 are to be edited by the contractor. On design drawings indicate air barrier limits and provide detail drawings and specifications for construction. Studs/furring shall be placed to avoid thermal bridging. Mechanical rooms are exempt from testing. All other areas shall be segregated and constructed for required air barrier construction with full blower door testing.

1.3.4 Handicapped Accessibility

The entire facility, except the firing range, mechanical, electrical, and telecommunication equipment rooms, shall be designed to be fully accessible in accordance with the Architectural Barriers Act (36 CFR 1191). The facility is intended to be used by able-bodied personnel only. Visitors with physical disabilities will be allowed as observers, but are prohibited from taking part in training activities.

1.3.5 Occupational Safety and Health

Building design shall comply with Occupational Safety and Health Standards (OSHA) criteria for all items which must be included in the design to ensure safety compliance.

1.3.6 Sound and Vibration Control

Standard materials and installation procedures shall be incorporated into the facility's design and construction for sound and vibration control. When constructing walls, ceilings, materials shall be selected that will impede transmission of equipment vibrations and other noises between rooms and within a room.

1.3.7 Security

Conventional security measures, such as door locking hardware, shall be incorporated into the facility's design and development.

Security panels, security equipment, and BMS shall be provided and
installed by others. The contractor shall dedicate locations for security panels and equipment in the Telecommunications room, and shall provide 120v power to these locations.

The arms vault shall be equipped with an Intrusion Detection System (IDS). The IDS system is not in contract, but the contractor shall equip the vault with all necessary rough-ins and conduit to accommodate a future IDS system installation per UFC 4-215-01

1.3.8 Applicable Design Criteria

See below for additional criteria that is applicable to the design of this project. See REFERENCES paragraph for full criteria listing.

UFC 1-200-01
ETL 08-13
ODDG
ASHRAE 90.1 - IP
AWI Qual Stds
SMACNA 1793
UL 2218

1.3.9 Material Selection Criteria

1.3.9.1 Economy

Where feasible, use materials readily available within the local area. No special or unique forms of construction shall be used, and skilled workers within the area shall be familiar with the proper methods required to build these facilities.

1.3.9.2 Operation and Maintenance

Material selections shall be based upon reducing operation and maintenance costs. All materials shall be easy to clean and resist soiling.

1.4 TECHNICAL SPECIFICATIONS

Government-provided technical guide specifications shall be completely edited and fully coordinated with the drawings to accurately and clearly identify the selected products and installation requirements for these facilities.

The guide specifications define the minimum requirements and level of quality for items of equipment, materials, installation, and testing that shall be provided for the facilities. Where requirements are not covered in the guide specifications, specification sections shall be prepared to cover those subjects and shall be in the same format as the guide specifications.

1.5 CONSTRUCTION SYSTEMS AND ASSEMBLIES

1.5.1 Construction Of Facilities

This facility shall be designed and constructed as permanent construction and any work under this project shall be considered permanent construction and brought up to current codes and standards. The definition of permanent construction is, "Facilities designed and constructed to serve a life expectancy of more than 50 years, should be energy efficient, and must have
finishes, materials, and systems selected for low maintenance and low life-cycle cost." Reference UFC 1-200-02 - DESIGN: High Performance and Sustainable Building requirements for additional design criteria.

Types and methods of construction are limited to the criteria established in this Section and all other Sections of the RFP, and shall meet all governing code applications.

Where wood construction is used for wood blocking, wood in contact with the ground, etc., the wood products shall be preservative treated. Primarily, wood shall be used in an ancillary use, such as blocking, and not as a prime construction material.

Walls, floors, ceilings and other affected systems shall be permanently constructed and attached to each other. All construction shall be done in a workman-like manner, properly installed, square and plumb as intended, and finished to match existing adjacent surfaces.

Methods, materials, systems, etc., shall match existing and be of a quality that requires little or no maintenance.

1.5.2 Precast Prestressed Structural Concrete

The contractor shall utilize non-composite precast concrete panels at building perimeter locations where thermal insulation is of primary importance. Care shall be taken in detailing to ensure a continuous thermal barrier throughout all non-composite panel areas. Areas of concrete webbing shall be reduced or eliminated to the greatest extent practicable by the precast concrete panel supplier. Non-conductive, non-composite wythe connectors shall be used. Insulation at openings, joints, and boundaries in the precast concrete panels may be tapered near openings, but must maintain a continuous thermal barrier. All other panels may be composite or solid panels.

1.5.3 Structural Standing Seam Metal Roof

Roofing shall be non-combustible structural standing seam metal roofing that meets or exceeds Class 4 impact resistance rating when tested in accordance with UL 2218. The standing seam metal roof assembly shall be designed to resist wind uplift loads of 100 mph in accordance with ASCE 7, and possess a 2 inch diameter hail warranty. Provide gutters and downspouts to drain roof surfaces. Coordinate downspout termination with storm water drainage systems. Install fall protection anchor points on all roofs with a slope greater than 2:12. For structural standing seam metal roofing, provide the material with 22 gauge minimum steel panels that are textured, ribbed, or striated to minimize possibility of oil canning.

The standing seam metal roofing manufacturer shall provide a no-dollar-limit materials and workmanship warranty for the roofing system. The warranty period shall be not less than 20 years from the date of Government acceptance of the work. The warranty shall be issued directly to the Government. The warranty shall provide that if within the warranty period the metal roofing system becomes non-watertight or shows evidence of corrosion, perforation, rupture or excess weathering due to deterioration of the roofing system resulting from defective materials or installed workmanship the repair or replacement of the defective materials and correction of the defective workmanship shall be the responsibility of the roofing system manufacturer. The warranty shall include all roof penetration items such as plumbing vents and mechanical equipment curbs;
eave, ridge caps, valley, wall, and other roof system flashings, and any other components specified within this contract to provide a weathertight roof system; and items specified in other sections of these specifications that are part of the SSSR system. Repairs that become necessary because of defective materials and workmanship while roofing is under warranty shall be performed within 7 days after notification, unless additional time is approved by the Contracting Officer. Failure to perform repairs within the specified period of time will constitute grounds for having the repairs performed by others and the cost billed to the manufacturer. The Contractor shall also provide a 2 year contractor weathertightness installation warranty.

For selected warranties, the contractor shall have the product manufacturer visit the site, complete an inspection, and provide the roof with the described warranty before the project will be considered complete.

1.5.4 Single Ply Membrane Roof

Single Ply Membrane Roof shall be internally fabric or scrim reinforced and fully adhered to its substrates. Width and length of sheets must be the maximum width attainable as recommended by the manufacturer to minimize field formed seams in the fields of the field of the roof. Single ply membrane roof shall be white in color, and be a cool roof as outlined in with an Solar Reflectance Index (SRI) value of 78 minimum.

Complete roof covering assembly, including insulation, flashings, and coping must be rated Class 1-90 in accordance with FM APP GUIDE to meet or exceed the factored uplift pressures outlined in FM Loss Prevention Data Sheet 1-28, and comply with FM Loss Prevention Data Sheet 1-29 for enhancements at the perimeter and corners. Do not install non-rated systems.

The roof membrane manufacturer shall provide a single source, comprehensive 20-year, non-pro-rated, no dollar limit total roof system warranty, including flashing, insulation, and accessories necessary for a watertight, wind, and hail resistant roof system construction. The components of the roofing system shall be products of a single roofing system manufacturer (except in the case the component is an accessory and that type of component is not available through the roofing system manufacturer) as required to provide the specified system warranty. The warranty shall include coverage for sustained wind speed and/or peak wind gusts up to 100 mph, damage from hail up to 1 1/2 inch in diameter, accidental punctures resulting from normal rooftop inspection, maintenance and/or service, and must state that:

a. If within the warranty period the roof system, as installed, becomes non-watertight, shows evidence of moisture intrusion within the assembly, splits, tears, cracks, delaminates, separates at the seams, shrinks to the point of bridging or tenting membrane at transitions, or shows evidence of excessive weathering due to wind, hail, accidental punctures, defective materials or installation workmanship, the repair or replacement of the defective and damaged materials of the roof system assembly and correction of defective workmanship must be the responsibility of the roof membrane manufacturer. The roof membrane manufacturer is responsible for all costs associated with the repair or replacement work.

b. When the manufacturer or his approved applicator fail to perform the repairs within 72 hours of notification, emergency temporary repairs performed by others does not void the warranty.
The roof system installer shall warrant for a period of not less than one (1) year that the roof system, as installed, is free from defects in installation workmanship, to include the roof membrane, flashing, insulation, accessories, attachments, and sheet metal installation integral to a complete watertight roof system assembly. The warranty must run directly to the Government. The roof system installer is responsible for correction of defective workmanship and replacement of damaged or affected materials. The installer is responsible for all costs associated with the repair or replacement work.

1.5.5 Soffits

Provide all roof systems and canopies with 24 gauge steel soffit panels. Soffit panels shall be factory finished to match roof color.

1.5.6 Windows

Provide windows as shown on drawings. Size and precise location of windows can be adjusted based on daylighting and energy analyses. Windows shall be low-E, insulated units, except for interior glazing. Exterior window units shall have an R-value (Winter nighttime) of 3.5 minimum, and a maximum shading coefficient of .33. Provide windows with thermally broken frames. All operable windows shall have locks and insect screens, excluding interior windows. Provide windows with exterior clear anodized aluminum sunshading devices.

1.5.7 Metal Wall Panels

Metal wall panels shall be 22 ga. thick for face sheet thickness, with a smooth exterior texture. Panels shall be minimum 12 inches wide.

1.5.8 Gypsum Board Assemblies

All gypsum wall board shall be 5/8" thick. Provide fire-resistant gypsum board where required to achieve fire-ratings. Pre-decorated gypsum board panels and trim system or similar type products and assemblies are not permitted.

All interior partitions shall be permanent, non-combustible construction, and shall be designed to withstand a 10-psf wind load with a maximum mid-span deflection of L/360. Typical interior partitions shall be framed with metal studs, with one layer of gypsum board on each side.

Steel studs shall be sized according to the furnished design and wall heights required.

Interior partitions requiring physical security, fire ratings, or sound ratings shall be designed and constructed in accordance with manufacturer's approved, tested system designs. These and other partitions extending to the underside of the roof structure shall be laterally braced to the structure and shall have slip tracks to accommodate structural deflection.

1.5.9 Gypsum Board Ceilings

All gypsum board shall be 5/8-inch thick. Gypsum board in toilet rooms, showers, janitor's closet and laundry shall be water/mold-resistant. Fire-resistant gypsum board shall be utilized where required to achieve fire-rating.
1.5.10 Exposed Structural Ceilings

All exposed ceilings shall be painted.

1.5.11 Insulation

Do not expose insulation on interior wall surfaces. Where pipe insulation is exposed in maintenance areas use insulation jackets of durable, protective fabric in accordance with the applicable criteria.

1.5.12 Acoustical Requirements

The ARMS RANGE shall have acoustical panels provided at perimeter walls and baffles in sufficient quantity to meet the noise reduction criteria of ETL 11-18. Locate these panels per paragraph 7.2.9.1 of ETL 11-18. The CONTROL BOOTH shall be designed so that the ceiling tile have a Noise Reduction Coefficient (NRC) of .85 or higher. Provide the OPEN OFFICE and NCOIC OFFICE with STC 42 rated partitions. Provide MEN'S RESTROOM, WOMEN'S RESTROOM, UNISEX TOILET and SHOWER with STC 42 rated partitions. Provide the LAUNDRY room with STC 50 rated partitions. Provide the STUDENT WEAPONS CLEANING room with STC 50 rated wall partitions. Provide the WEAPONS MAINTENANCE SHOP with STC 50 rated wall partitions. Provide the CLASSROOM 111 with STC 50 rated partitions. Provide the OBSERVATION ROOM with STC 46 rated partitions. Provide the WEAPONS SIMULATOR rooms with STC 50 rated partitions. Provide the ARMS RANGE with STC 50 rated partitions. At shared walls, rooms with the higher STC rating requirements shall override lesser requirements for adjacent rooms.

1.5.13 Arms Racks

Provide Arms Storage Lockers in quantity and configuration as shown on design drawings. Basis of design is "Secure-it Tactical" Weapon Rack Model 84 or equivalent. Requirements for Arms Storage Lockers shall be as follows:

Cabinet footprint must not be any larger than 36" x 16" x 84."

Rack must utilize bi-folding, non-retractable door design with a minimum of a nine point locking mechanism and padlock attachment. Cabinets must be secured by using one standard military issued padlock. Cabinets that require more than one padlock to secure are not acceptable.

Minimum of 14 gauge all welded steel construction with diamond perforations for ventilation and visual access.

Provide a minimum of 2 adjustable shelves per locker unit. Internal shelf storage capacity 900lbs per shelf, fully adjustable with no hardware.

All internal storage components allow for instantaneous reconfiguration without the need for tools.

Cabinets must be provided in the quantity indicated on the drawings. Each cabinet shall be provided with manufacturer standard clips, supports and accessories to house a variety of standard-issue individual weapons. A weapons inventory will be provided to the contractor upon contract award.
1.5.14 Bullet Trap

Provide a bullet trap system with deceleration chamber and dust and solids collection complying with the requirements of ETL 11-18. The bullet trap shall absorb all fired ammunition projectiles, including acute angle strikes while preventing splash backs and ricochets. The bullet trap shall be of the dry funnel type and not require liquid or fluid. The bullet trap shall be constructed to catch rounds up to and including 7.62mm rifle caliber ammunition. The bullet trap shall be self-supporting, and shall not utilize vertical support members at the trap mouth. No bolts or fasteners shall be exposed to direct line of fire. The bullet trap shall be equipped with gravity fed spent bullet collection containers at each lane, as opposed to an automatic bullet recovery system. Containers shall be removable, weatherproof and corrosion resistant. The collection containers shall create a tight seal when attached to the bullet trap. The bullet trap shall be equipped with a dust collection system. The dust collection system shall be a mechanically driven active filtration system to capture and remove airborne lead particles at the trap. The dust collection system shall have 2-3 levels of filtration and a reverse pulse system to keep filters clean. The dust removed with the pulse system shall be deposited automatically into sealed drums for easy disposal/removal. The dust collection system shall employ a sound dampening system to minimize the level of sound produced by the system. The automatic cleaning of the unit shall be achieved using a solid state controller to automatically sequence the pulse valves to release the collected dust. An alarm or warning indicator shall be provided to notify operators if filters become clogged to prevent damage to the system or interfere with the system's ability to collect dust. The whole system including bullet trap, dust collection system, and automatic bullet recovery system shall be operated by an integrated control system from the control room. The control system shall include all necessary monitoring devices and both audible and visual alarms to alert the range operators in the event of equipment failure. The manufacturer shall warrant the bullet trap system to be free of defects in material, operation, and workmanship for a period of five years. All defects or equipment failures, including wear resulting from use, during the five year period shall be corrected by the manufacturer. The manufacturer shall provide all scheduled maintenance, other than weekly/monthly preventative maintenance for a period of five years. During the five year period, the manufacturer is responsible for replacement parts and labor, and disposal of all repair and maintenance waste. The bullet trap system manufacturer shall provide training to the user’s designated personnel demonstrating how to operate and maintain the bullet trap system and maintain the warranty. The contractor shall provide a certificate showing that the correct grade of steel is installed per paragraph 7.5.8 of ETL 11-18.

1.5.15 Louvers

Provide louvers and other air intakes that are size and located in coordination with mechanical requirements, ATFP criteria, and other applicable criteria. Louvers shall be designed to complement the aesthetic appearance of the building. Exterior louvers shall be self draining, shall exclude wind-driven rain and withstand wind loads in accordance with applicable codes. Louvers shall be equipped with bird screens. Louver finish shall be factory applied.

1.5.16 Access Doors and Panels

Access doors and panels shall be flush type. Frames for access doors shall
be fabricated of not lighter than 16 gauge steel with welded joints and finished with anchorage for securing into construction. Access doors shall be a minimum of 14-inches by 20-inches and of not lighter than 14 gauge steel, with stiffened edges, complete with attachments. Access doors shall be hinged to frame and provided with a flush face and a keyed operated latch. Exposed metal surfaces shall have a shop applied prime coat. Finished paint coat shall match surrounding surfaces. Panel shall be installed in uninhabited rooms (i.e., closets) and/or non-conspicuous locations. Panels shall be installed at all locations requiring access to plumbing, mechanical and electrical controls.

1.5.17  Interior Sealant

For general interior applications, sealant shall be low VOC acrylic polymer sealant complying with ASTM C 834.

For interior traffic joints in horizontal surfaces, low VOC sealant shall comply with ASTM C 920, Type C, S, or M, Grade P, Class 25, Use T.

For interior moisture locations, sealant shall be low VOC silicone complying with ASTM C 920, Type S, Grade NS, Class 25, and with ANSI A 136.1 for mold growth.

Use acoustical sealant at both sides of bottoms and tops of all partitions and ceilings. Sealant shall be a low VOC rubber- or polymer-based acoustical sealant conforming to ASTM C 919, and shall have a flame spread of 25 or less and a smoke developed rating of 50 or less, when tested in accordance with ASTM E 84. Acoutical sealant must have a consistency of 250-310, when tested in accordance with ASTM C 734, and must remain flexible and adhesive after 500-hours of accelerated weathering as specified in ASTM C 734, and must be non-staining.

Use fire-stop or smoke-stop sealant at all partitions with fire- or smoke-ratings.

1.5.18  Exterior Doors

1.5.18.1  Doors for Egress

Any door that shall be used as a means of egress shall comply with NFPA 101 Section 7.2.1.3 "Floor Level". The elevation of the floor surfaces on each sides of the doorway shall not vary by more than 1/2". The elevation of the floor surfaces shall be maintained on both sides of the doorway for a distance not less than the width of the widest door leaf. Thresholds shall not exceed 1/2" in height. No exceptions.

1.5.18.2  Exterior Hollow Metal Doors

All flush exterior doors shall be insulated and minimum Level 2 performance Level B per SDI/DOOR A250.8. All door frames shall be welded. No knock-down frames shall be allowed. Minimum thickness for hollow metal doors shall be 1-3/4 inches. Door frames not located under protective overhangs shall have continuous overhead rain drips for the full length of the door opening. All doors shall include aluminum thresholds and aluminum housed weather seals. Exterior door frames shall be galvanized, with a paint top coat. The contractor shall take care to ensure paint coating properly adheres to galvanized metal. Exterior flush doors shall receive a painted finish. Risk Level II doors shall be a minimum of 16-gauge hollow metal steel with a minimum of 16-gauge hollow metal frame system. Exterior doors shall exceed
minimum insulation required in ASHRAE 90.1 2007 to meet the minimum requirements listed under energy conservation and sustainable design. Door frames shall be filled with spray foam insulation.

New egress doors and frames shall be hollow metal and be blast resistant as specified in UFC 4-010-01.

1.5.18.3 Exterior Glazed Entry Doors

Exterior glazed entry systems shall be reinforced commercial grade aluminum or steel, thermally broken. Doors shall be factory prepared for door hardware. Storefront entry systems shall comply with paragraph B-3 of Appendix B of UFC 4-010-01 and specified structural requirements per ICC IBC, ASCE 7, and structural requirements of this RFP.

1.5.18.4 Thresholds

All exterior thresholds shall be thermally broken.

1.5.19 Interior Doors

Doors shall be solid core wood unless otherwise noted. Door frames shall be welded hollow metal type. Doors shall be fire-rated and/or STC rated as required. When required to meet the requirements of the RFP, metal doors may be used when wood doors will not meet the requirement. Doors required to have an STC 45 or greater rating shall be a complete fully tested "assembly" including door, frame, gasketing, threshold, etc. of a single manufacturer, and certified to achieve an STC rating that corresponds to the wall or room it is contained. All door frames shall be welded. Knock-down frames are not allowed. Doors shall be factory stained and finished and factory prepared for door hardware. ARMS RANGE 113 interior doors shall be STC 50 rated, along with being thermally insulated to the level of exterior doors.

Verify all interior door sizes and door swings adhere to the latest life safety regulations. Door frames must be of sufficient strength to preclude distortion that could cause improper alignment of door alarm sensors, improper door closure, or degradation of acoustical security.

1.5.20 Fire Doors

Doors to have a fire resistance rating shall conforming to the requirements of UL 10B or NFPA 252 for the class of door required. Affix a permanent metal label with raised or incised markings indicating testing agency's name and approved hourly fire rating to hinge edge of each door.

1.5.21 Hardware

Contractor shall coordinate specific hardware requirements with Government. Use lever handles per ABA/ADAAG. Provide all hardware in heavy-duty commercial grade.

Provide doors in rooms with sound attenuation requirements with appropriate level of sound gasketing and door bottoms.

Provide fire rated doors with fire seals as required by code.

Provided exterior doors with weatherstripping.
Provide all hardware necessary to meet the requirements of NFPA 80 for fire doors and NFPA 101 for exit doors. Comply with the ABA for all doors.

All hinges shall be Grade 1 full mortise type hinges with anti-friction bearings. Doors up to 82-inches tall shall be equipped with a minimum of three hinges per door leaf. Extra heavy doors or tall doors shall have additional or special-type hinges provided as recommended by the door manufacturer. Hinges shall be fully recessed and fit flush within designated frame slots, and shall be recessed into door edge for flush fit. Provide non-removable pins at all exterior doors.

Exit devices shall be rim or concealed rod type, with lever trim where required.

Provide a Knox Box, series 3200, as manufactured by Knox Company Phoenix, Arizona, at the main entrance. As required by the base Fire Marshal, provide one (1) additional Knox Box at a back or side entrance as coordinated with the COR.

For restrooms, provide a dead bolt lock on the main entry door(s) into the space, so that the entire space can be closed off for maintenance or other access control purposes.

Door Stops - Door Stops are required at all interior and exterior locations

CORRIDOR exterior doors, excluding the main entrance at the VESTIBULE, and ARMS RANGE exterior doors shall be equipped with utility space locks, with the door locked at all times. Confirm this requirement with COR.

1.5.21.1 Door Closers

Automatic door closers shall only be used on exterior doors, fire doors, latrine/toilet and locker room doors, and elsewhere as required by code or to meet the requirements of ETL 11-18.

1.5.21.2 Keyed Access Entry Control Systems

Install all locksets and exit devices, including combination and installation of any required cores and key duplication. The core type and combination shall meet the requirements of the Installation's master key system. To meet Buckley AFB master key plan, provide all keyed lockset devices with patented Best Lock Corporation cores. Cores shall be seven pin tumbler cores. Keyways shall be "J" type.

All cores shall include four keys for each interior doors and five keys for each exterior doors and with two master keys for each KNOX box placed at the building location. Furnish a quantity of key blanks equal to 20-percent of the total number of file keys. Stamp all keys with "U.S. GOVERNMENT DO NOT DUPLICATE". In addition, stamp the keys and cores with the core number. Do not place room number on keys. Turn over all master keys provided to the Buckley AFB O&M locksmith for security control through the Contracting Officer's Representative (COR). Inventory and turn over all other keys to the Government for issue to the building occupants through the COR. Provide a key cabinet and control system for all facility keys, including a floor plan cross referenced to all key locations.

Access to Mechanical, Electrical and Telecommunications spaces shall be limited to authorized personnel through lockable doors. Locate exterior Mechanical, Electrical, Telecommunications Equipment, and air intake and
openings in exterior walls to comply with anti-terrorism force protection (AT/FP) standards. These rooms shall be keyed independently from the building master system for access by installation maintenance personnel. The telecommunication room door(s) shall be on a different core than other electrical and mechanical areas. Exterior access at grade is required for the mechanical room. Coordinate with COR and Buckley AFB CES for additional keying requirements.

Doors to ARMS RANGE 118 require key-operated locked doors to prevent entry while firing is in progress, per paragraph 7.2.12.1 of ETL 11-18.

1.5.22 Interior Finishes

Interior finishes are described in SECTION 01 84 00 INTERIOR DESIGN REQUIREMENTS.

1.5.22.1 Concrete Floor Cleaning and Sealing

All concrete slabs not specified to receive a floor finish shall be thoroughly cleaned of all dirt, dust and construction splatter, and shall be sealed with a clear waterborne chemically-reactive concrete sealer, matte finish.

1.5.22.2 Acoustical Tile Ceilings

Acoustical tile ceilings shall be 24-inch x 24-inch tegular-edge panels in a medium-duty suspension system. Suspension system shall be a 15/16 inch wide, capped, double-web, steel system furnished in the manufacturer's standard white factory-applied finish. Provide manufacturer's standard edge moldings and other associated trim. Suspend grid with zinc-coated carbon steel wire hangers at a spacing not to exceed 48-inches along each member supported directly from hangers. At ceiling grid perimeter, provide hanger wires not more than 8-inches from ends of each ceiling grid member.

Acoustical tile ceiling products shall have the following salient characteristics: NRC of 0.75 or greater, LR of 0.83 or greater, and CAC of 35 or greater. Finish locations are identified in the Room Finish Schedule on the Drawings.

1.6 FIRE PROTECTION SPECIALTIES

1.6.1 Fire Extinguishers Cabinets

Fire extinguishers cabinets shall be provided throughout the facilities to comply with requirements of NFPA 10, including travel distance. All fire extinguishers in finished areas shall be located in semi-recessed cabinets. Fire extinguisher cabinets shall be semi-recessed type with a (flat) clear glazing type door front. Provide fire extinguisher cabinets with the same fire-resistance rating as the wall in which they occur. Fire extinguisher cabinets, doors, and trim shall be satin stainless steel finish. Install top of fire extinguisher cabinets at 64-inches above finished floor.

All fire extinguishers in unfinished areas, including mechanical, electrical, and communications rooms, shall be bracket-mounted.

Fire extinguisher cabinets shall be located in accordance with NFPA 101.
1.7 EQUIPMENT AND FIXTURES

1.7.1 CFCI Equipment and Fixtures

Contractor Furnished, Contractor Installed (CFCI) equipment and fixtures within these facilities shall include all items fastened to the building structure, including, but not limited to, the following:

a. Telephone System (conduits, boxes, wiring, devices, and cover plates)
b. Cable Television (CATV) (conduits, boxes, wiring, devices, and cover plates)
c. Miscellaneous metals
d. Fire extinguishers, brackets, and cabinets
e. Ceiling systems
f. Casework and millwork
g. Interior and exterior signage
h. Server racks
i. Corner guards
j. Security Systems infrastructure (conduits, boxes, wiring, devices, and cover plates)
k. Audio/Visual Infrastructure (conduits, boxes, wiring, devices, and cover plates)
l. Information Systems infrastructure (conduits, boxes, wiring, devices, and cover plates)
m. Lockers

1.7.2 GFCI Equipment and Fixtures

Government Furnished, Contractor Installed (GFCI) equipment and fixtures are not included in this RFP.

1.7.3 GFGI Equipment and Fixtures

Government Furnished, Government Installed (GFGI) equipment and fixtures within these facilities include, but are not limited to, the following (Note: properly sized plumbing, electrical, and communication services to be included in contract):

a. VCR's and DVD players
b. Copy and fax machines
c. Network and PC printers, scanners and plotters
d. Shredders
e. Computer equipment
f. Telephones and telephone switching equipment
g. Recycling containers
h. Furniture

1.7.4 Exterior Signage

Contractor shall provide and install a two-sided free-standing building identification sign. Coordinate with the end user for location. Sign shall have a concrete base, and shall comply with requirements of Buckley AFB. Verify verbiage with the COR prior to fabrication. Signage shall comply with UFC 3-120-01.

-- End of Section --
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PART 1  GENERAL

1.1  REFERENCES

The design publications listed below are sources of criteria for structural design. The criteria from these sources may be supplemented, but not supplanted, by applicable criteria contained in nationally recognized codes, standards, and specifications.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-261 (1999) Quality Assurance of Laboratory Testing Procedures

U.S. DEPARTMENT OF DEFENSE (DOD)

AF ETL 11-18 (2014) Small Arms Range Design and Construction

AF FC 4-179-03F (2015) Air Force Indoor Small Arms Firing Range


UFC 3-301-01 (2013; with Change 1) Structural Engineering

UFC 3-310-04 (2016) Seismic Design for Buildings

UFC 4-010-01 (2012; with Change 1) DoD Minimum Antiterrorism Standards for Buildings

UFC 4-215-01 (2014) Armories and Arms Rooms

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 117 (2010; Errata 2011) Specifications for Tolerances for Concrete Construction and Materials and Commentary

ACI 302.1R (2015) Guide for Concrete Floor and Slab Construction

ACI 318 (2014; Errata 1-2 2014; Errata 3-5 2015; Errata 6 2016) Building Code Requirements for Structural Concrete and Commentary

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)


AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI S100 (2012) North American Specification for the Design of Cold-Formed Steel Structural Members

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)


ASTM INTERNATIONAL (ASTM)


ASTM A 500/A 500M (2010) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes


ASTM A 653/A 653M (2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process


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<td>(2012a) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete</td>
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<td>(2011) Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs</td>
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<td>ASTM F 1554</td>
<td>(2007ae1) Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength</td>
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<td>SDI 30</td>
<td>(2001) Design Manual for Composite Decks, Form Decks, and Roof Decks</td>
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STEEL JOIST INSTITUTE (SJI)

SJI LOAD TABLES (2010; Errata 1 2011; Errata 2 2012) 42nd Edition Catalog of Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders

1.2 PROJECT DESCRIPTION AND REQUIREMENTS

The purpose of this project is to design and construct a new Small Arms Range Complex at Buckley Air Force Base in Aurora, Colorado. The scope involves demolishing and remediating the existing firing range site, and constructing a new one-story Small Arms Range Complex with both an indoor range component as well as an attached Combat Arms Training and Maintenance Facility component. The facility will consist of load bearing precast concrete walls that will support the steel-framed roof structure. The roof structure will consist of standing seam metal roofing on metal decking, supported by steel joists. Besides the roof envelope, the steel roof will also support the steel ballistic baffles. The axial loads will be transferred from the roof to the steel roof framing, and then into the ground via the precast walls. The precast walls will also serve as the lateral force-resisting system.

The firing range will need to be designed to support forklift loads to allow for future repairs and adjustments to the baffling and bullet collection systems. The Issue room will need to be designed to accommodate a 150psf live load. The facility will be designed and constructed in accordance with the 2015 IBC, UFC 3-301-01, AF ETL 11-18, and AF FC 4-179-03F. Glazing, frames, supporting structural elements, and anchorage shall be designed in accordance with requirements of UFC 4-010-01: DoD Minimum Antiterrorism Standards for Buildings. The small arms vault shall not be a prefabricated vault, shall have a GSA approved door, and shall also be designed in accordance with the requirements of DOD 5100.76-M and MIL-HDBK-1013/1A.

1.3 STRUCTURAL DESIGN LOADS AND CRITERIA

Structural loading criteria shall be developed for the building using site and project specific criteria as well as the criteria and procedures indicated below. The building shall be classified as an Occupancy Category II structure in accordance with UFC 3-301-01 for the determination of snow, seismic, and wind loads.

1.3.1 Antiterrorism / Force Protection (AT/FP)

Based on the government's assessment of the facility for AT/FP, blast resistant mitigation is required for all exterior structural elements in accordance with UFC 4-010-01 "DoD Minimum Antiterrorism Standards for Buildings". Structural design calculations for door and window blast design shall be provided. All design assumptions and criteria shall be clearly stated in the design calculations. Refer to Specification 01 89 00 "SITE WORK REQUIREMENTS" for determining standoff distance requirements.

1.3.2 Small Arms Vault

The small arms vault shall be designed in accordance with the requirements of DOD 5100.76-M MIL-HDBK-1013/1A, and UFC 4-215-01.
1.3.3  Firing Range

The firing range shall be designed in accordance with the requirements of AF ETL 11-18 and AF FC 4-179-03F.

1.3.4  Dead Loads

Minimum design dead loads for common building materials shall be obtained from ASCE 7-10 as applicable. Loads for materials not listed in ASCE 7-10 and equipment loads shall be obtained from other recognized sources.

1.3.5  Roof Live Loads and Snow Loads

1.3.5.1  Minimum Roof Live Load

A minimum roof live load of 20 psf shall be provided for in the design to account for construction and maintenance loads. The minimum roof live load shall not be reduced. The minimum roof live load shall be applied in accordance with ICC IBC and shall be used as a loading condition for the roof and independent of the calculated snow loads.

1.3.5.2  Roof Snow Load

Roof snow load shall be applied in accordance with ASCE 7-10. A ground snow load (Pg) of 20 psf shall be used in determining the roof snow loads. Snow drift and sliding snow loads shall be taken into consideration. Other factors used in determining snow loads are as follows:

Terrain Category          =  C
Snow Exposure Factor, Ce  =  1.0
Snow Thermal Factor, Ct   =  1.0
Snow Importance Factor, Is =  1.0

1.3.5.3  Rain-On-Snow Load

A rain-on-snow load, if applicable, shall be applied in accordance with ASCE 7-10.

1.3.6  Floor Live Loads

Floor live loads shall be in accordance with ICC IBC for the type of occupancy indicated, except as modified herein, and to accommodate any special requirements from the buildings user.

The Issue room will need to be designed to accommodate a 150psf live load.

The floor of the firing range shall be designed to accommodate a 70psf live load, as well as a forklift load to allow for future repairs and adjustments to the baffling and bullet collection systems.

1.3.7  Wind Loads

Wind loads for both the main wind force resisting system and for components and cladding shall be determined in accordance with ICC IBC and ASCE 7-10 using the following parameters:

Basic Wind Speed, V        =  115 mph
(3-second gust)
Wind Exposure Category          =       C
Internal Pressure Coefficient   =       +/- 0.55 (ASCE 7-10,Table 26.11-1,
Partially Enclosed Bldg.)

1.3.8   Seismic Loads

Seismic loads shall be determined in accordance with the applicable
requirements of UFC 3-310-04, 2012 IBC, and ASCE 7-10. For existing
buildings, a seismic evaluation must be performed in accordance with the
latest version of ASCE/SEI 31 and ASCE/SEI 41. The total lateral seismic
force shall be determined using the following parameters:

Risk Category = II
Seismic Importance Factor, Ie = 1.0
Mapped Spectral Response Acceleration, Ss = 0.17g
Mapped Spectral Response Coefficient, S1= 0.06g
Site Classification = D
Seismic Design Category = B (Needs to be Verified)

1.3.9   Interior Partition Lateral Loads

Interior partitions shall be designed for a wind pressure of 5 psf normal
to the partition. The deflection of interior partitions due to wind loads
shall not exceed 1/360 the span for walls with brittle finishes and 1/240
for walls with flexible finishes. Other design requirements such as
seismic may be more restrictive and control the design of the partitions.

1.3.10   Load Combinations

Load combinations shall be in accordance with ASCE 7-10.

1.3.11   Wind Uplift Resistance

Wind uplift calculations shall be based on the criteria for Wind Loads
contained herein.

1.3.12   Deflections

Deflections of structural members and systems shall not be greater than
allowed by applicable codes, references, and material standards (IBC, ACI,
AISC, etc.) and shall not impair the serviceability of the structure.
Deflection limits needed to restrict damage to ceilings, partitions, and
other fragile non-structural elements shall not exceed the deflection over
span length (l) limits permitted by the ICC IBC.

1.3.13   Drift

Drift limits applicable to code-specified seismic loads (criteria noted
above) shall be in accordance with the UFC 3-301-01.

1.4   FOUNDATION DESIGN

Final foundation design, foundation type, and subgrade proposed to be built
by the Contractor shall be based on the recommendations contained in the
Final Soils and Foundation Analysis appendix.
1.5 Structural Stoops at Exterior Doorways

Structural stoops shall be provided at exterior doorways. Stoops shall have foundations extending down to frost depth and shall be rigidly attached to the building foundation walls. Stoops shall have 12 inches of uncompacted fill under the stoop slab. Stoop slabs shall drop 1/2 inch relative to the interior floor slab-on-grade at the threshold and slope away from the building at a 1/4 inch per foot slope minimum.

1.6 INTERIOR SLABS-ON-GRADE DESIGN

The structural slab or slab-on-grade design shall be based upon the information in the Final Geotechnical Investigation Report, which shall be provided by the contractor. Slabs-on-grade (interior) shall be designed in accordance with the guidelines of ACI 302.1R, "Guide to Concrete Floor and Slab Construction". Proper construction methods, workmanship, slab-on-grade materials and preparation, and concrete mix proportioning specifications shall follow the guidelines of ACI 302.1R, "Guide to Concrete Floor and Slab Construction". Interior slabs-on-grade shall be designed as "floating slabs" without rigid edge support and lateral and vertical movement unrestrained. An isolation joint consisting of 30 lb. felt or 1/2-inch expansion joint material, is required where slabs abut vertical surfaces.

1.6.1 Crack Control

Crack control measures shall be incorporated in the slab design. Control joint spacing and details shall be as delineated in ACI 302.1R, as applicable. Slabs-on-grade shall be jointed and reinforced with temperature and shrinkage reinforcement located near the top of the slab in order to control shrinkage and limit curling. Slab-on-grade temperature and shrinkage reinforcement shall not be less than 0.18 percent per ACI 318 requirements. Maximum spacing of the slab-on-grade reinforcing bars shall not exceed three times the slab thickness.

1.6.2 Vapor Emission Control

For slabs to receive adhered finish flooring, coatings, tile, resinous flooring, and other vapor sensitive finishes, vapor control measures shall be incorporated into the project specifications. The floor finish systems for the facility generally require that the moisture/vapor transmission rate through the slab be limited to a maximum of 3 pounds per 1000 square feet in a 24 hour period. Appropriate and sufficient vapor emission control measures shall be designed to meet this criterion, and shall include, but not be limited to, an underslab vapor retarder properly placed in the supporting subgrade system.

As a minimum, a 10 mil thick polyolefin membrane manufactured with virgin resins, complying with ASTM E1745, Class A, shall be required beneath all building slabs-on-grade. Joint tape shall be manufacturer's standard for vapor retarder product used and shall be applied to all seams in each layer. Each layer shall be adhered to foundation at perimeter. All penetrations through the vapor retarder shall be sealed.

1.6.3 Supporting Subgrade System

The slab-on-grade supporting subgrade system shall be in accordance with the recommendations of ACI 302.1R and recommendations contained in the Final Geotechnical Investigation Report. All interior slabs-on-grade shall be constructed with a vapor retarder system and a compacted 6-inch...
capillary water barrier on compacted subgrade. The location of the vapor retarder system relative to the capillary water barrier shall be in accordance with recommendations contained in ACI 302.1R.

1.6.4 Capillary Water Barrier Layer
Capillary water barrier material shall be in accordance with the recommendations contained in the Final Geotechnical Investigation Report for material type and installation requirements.

1.6.5 Underslab Vapor Retarder
As a minimum, a 10 mil thick polyolefin membrane manufactured with virgin resins, complying with ASTM E1745, Class A, shall be required beneath all building slabs-on-grade. Joint tape shall be manufacturer's standard for vapor retarder product used and shall be applied to all seams in each layer. Each layer shall be adhered to foundation at perimeter. All penetrations through the vapor retarder shall be sealed.

1.6.6 Concrete Floor Slab Finishes
All interior concrete slabs will receive a trowel finish unless noted otherwise. Interior slabs to receive mortar setting beds will receive rough slab finish.

1.6.7 Floor Tolerances
There are no special flatness and levelness requirements for the floor, however, the flatness and levelness of all concrete slabs-on-grade shall be carefully controlled and the tolerances measured by the F-Number or straightedge system of ACI 117. The minimum surface profile quality classifications for float and trowel finishes surfaces shall be "flat" as defined in ACI 117. All other finishes shall meet the criteria set forth in ACI 117.

1.7 EXTERIOR CONCRETE SLAB DESIGN
Design and specification of exterior concrete slabs shall incorporate measures for durability in a cold weather climate.

1.7.1 Exterior Slabs at Exterior Doorways
Exterior slabs shall dowel into foundation wall or interior slabs sufficiently to prevent exterior slab heave.

1.7.2 Exterior Equipment Pads
Exterior mechanical or electrical equipment shall be installed on concrete pads. Equipment pads shall be a minimum of 8 inches thick, 4 inches above finished grade, and reinforced with at least the minimum temperature and shrinkage reinforcement required by ACI 318. The pads shall be sized a minimum of 12 inches larger all around than the piece of equipment furnished and all edges- of the pad shall be chamfered. The Contractor shall coordinate the design of the exterior equipment pads with the mechanical and electrical system design and the equipment selected to be installed by the Contractor.
1.8 STRUCTURAL MATERIALS DESIGN DATA

Materials for structural elements shall be as indicated herein and/or on the RFP drawings.

1.8.1 REINFORCED CONCRETE

1.8.1.1 Design

Reinforced concrete shall be designed and detailed in accordance with the ICC IBC as modified by ACI 318, and related current ACI publications that are applicable to the design. All concrete elements, including slabs-on-grade, shall be reinforced with temperature and shrinkage reinforcement as recommended by ACI as a minimum.

1.8.1.2 Concrete Strength and Durability

Concrete shall be composed of cementitious material, water, fine and coarse aggregates, and admixtures. The total cementitious material content shall be at least 517 lbs per cubic yard.

Concrete shall meet the durability requirements of Chapter 4 of ACI 318 for buildings. These requirements may involve determining concentrations of sulfate ions, chloride ions, and other chemicals in order to select the appropriate cement type, strength, and water/cement ratio.

Material testing shall be performed by US Army Corps of Engineers (USACE) accredited laboratory in accordance with ER 1110-1-261. The accreditation shall be current for each applicable test method.

Size number and class designation of coarse aggregate shall be provided in accordance with ASTM C33/C33M.

Gradation and limits for deleterious substances in fine aggregates shall be provided in accordance with ASTM C33/C33M.

Fine and coarse aggregates shall be tested and evaluated separately for alkali-aggregate reactivity (ASR) in accordance with ASTM C1260. All results of the testing shall have a measured expansion less than 0.10 percent at 16 days after casting. Should the test data indicate an expansion of 0.10 percent or greater, reject the aggregate(s) or perform additional testing using ASTM C1260 and ASTM C1567. Perform the additional testing using ASTM C1260 and ASTM C1567 using low alkali portland cement in combination with ground granulated blast furnace slag (ASTM C989/C989M) or Class F fly ash (ASTM C618) until the measured expansion is less than 0.10 percent.

1.8.1.3 Reinforcing Steel Bars

Reinforcing bars (deformed) used in concrete design shall be ASTM A 615/A 615M, Grade 60 (Fy = 60ksi). Reinforcing bars (deformed) required to be welded shall be ASTM A 706/A 706M, Grade 60 (Fy = 60ksi). The minimum bar size is No. 4 except for stirrups and ties which may be No. 3 per ACI.

1.8.1.4 Welded Wire Fabric

Welded Wire Fabric where used in exterior slabs and flat work shall be provided in flat sheets and conform to ASTM A 185/A 185M with a minimum
yield strength, \( F_y = 60 \text{ksi} \).

1.8.1.5 Concrete Joints

Control joints and contraction joints shall be located to limit concrete cracking to a minimum.

1.8.2 CONCRETE MASONRY

1.8.2.1 Design

Masonry design shall be in accordance with ACI 530/530.1 as modified by the ICC IBC, and UFC 3-301-01.

1.8.2.2 Concrete Masonry Material Strengths

Masonry materials shall meet the following minimum requirements:

- Masonry shall have a specified prism strength \( f'm = 1500 \text{psi} \) at 28 days.
- Hollow concrete masonry units (CMU) shall be two cell lightweight aggregate units conforming to ASTM C 90, Type I and have a minimum compressive strength of 1900 psi on the net area (1000 psi on the gross area) at 28 days.
- Mortar shall be Type S conforming to ASTM C 270, with a specified minimum compressive strength of 1800 psi at 28 days.
- Grout shall conform to ASTM C 476 and shall have a specified minimum compressive strength \( (f'c) \) of 3000 psi at 28 days.

1.8.2.3 Concrete Masonry Reinforcing

Reinforcing bars (deformed) used in masonry design shall be ASTM A 615/A 615M, Grade 60 (\( F_y = 60 \text{ ksi} \)). Reinforcing bars (deformed) required to be welded shall be ASTM A 706/A 706M, Grade 60 (\( F_y = 60 \text{ ksi} \)). The minimum reinforcing bar size is a No. 4. Joint reinforcing shall be 9 gage minimum and be spaced at 16 inches on center.

1.8.3 PRECAST CONCRETE

Design precast prestressed members in accordance with ACI 318 or PCI MNL-120. Design precast prestressed members (including connections) for the design load conditions and spans indicated, handling and erection stresses, and for additional loads imposed by openings and supports of the work of other trades. Design precast prestressed members for handling without cracking in accordance with the PCI MNL-120. Design steel members and connections in accordance with AISC 325.

1.8.4 STRUCTURAL STEEL

1.8.4.1 Design

Structural steel shall be designed in accordance with the ICC IBC and the AISC Specifications. All structural steel members shall be designed by the structural engineer to support all applicable loads. Structural drawings shall clearly show all structural members and their locations. Types of connections shall be consistent with the design assumptions for the basic type of steel construction used. Connections shall be designed and detailed...
to provide adequate capacities for the applied forces and moments. Connection design shall be the responsibility of the structural engineer and shall not be delegated to the steel fabricator.

### 1.8.4.2 Structural Steel Materials

Structural steel materials shall meet the following minimum requirements:

<table>
<thead>
<tr>
<th>Steel Type</th>
<th>ASTM</th>
<th>Grade</th>
<th>Yield Strength, Fy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Wide Flange Beams &amp; Columns (W-Shapes)</td>
<td>ASTM A 992/A 992M</td>
<td>50ksi</td>
<td></td>
</tr>
<tr>
<td>Structural Tees (WT-Shapes)</td>
<td>ASTM A 992/A 992M</td>
<td>50ksi</td>
<td></td>
</tr>
<tr>
<td>Structural Channels &amp; Angles (C, MC, &amp; L-Shapes)</td>
<td>ASTM A 36/A 36M</td>
<td>36ksi</td>
<td></td>
</tr>
<tr>
<td>Structural Plates &amp; Bars</td>
<td>ASTM A 36/A 36M</td>
<td>36ksi</td>
<td></td>
</tr>
<tr>
<td>Structural Steel Pipe</td>
<td>ASTM A 53/A 53M B, Type E or S</td>
<td>35ksi</td>
<td></td>
</tr>
<tr>
<td>Structural Steel Tubing (TS-Shapes)</td>
<td>ASTM A 500/A 500M B</td>
<td>46ksi</td>
<td></td>
</tr>
<tr>
<td>Hollow Structural Sections (HSS Shapes)</td>
<td>ASTM A 500/A 500M C</td>
<td>50ksi</td>
<td></td>
</tr>
<tr>
<td>Structural Anchor Rods</td>
<td>ASTM F 1554</td>
<td>36ksi</td>
<td></td>
</tr>
<tr>
<td>High Strength Structural Bolts</td>
<td>ASTM A 325</td>
<td>Fu=120ksi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASTM A490</td>
<td>Fu=150ksi</td>
<td></td>
</tr>
<tr>
<td>Welding Rods (Structural Steel)</td>
<td>E70XX</td>
<td>Fu=70ksi</td>
<td></td>
</tr>
<tr>
<td>Welding Rods (Steel Decking)</td>
<td>E60XX</td>
<td>Fu=60ksi</td>
<td></td>
</tr>
</tbody>
</table>

### 1.8.4.3 Connections

Types of connections shall be consistent with the design assumptions for the basic type of steel construction used. Connections shall be designed and detailed to provide adequate capacities for the applied forces and moments. Connection design shall be the responsibility of a licensed structural engineer and shall not be delegated to the steel fabricator.

### 1.8.5 STEEL JOISTS

The design and selection of steel joists shall be governed by the SJI LOAD TABLES (2005) Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders - 42nd Edition. The wind uplift requirements shall be clearly delineated on the design drawings or with the specifications. Joists requiring special design to resist wind uplift and non-uniform loads shall be designated as such on the drawings, and the required design loads provided. The designer shall provide joist-loading diagrams on the drawings for all joists with geometric configurations outside the scope of the SJI Standard Specifications for Steel Joists and Joist Girders. Joist end supports and anchorage to resist uplift shall be designed to accommodate the applied forces, including those resulting from wind and seismic loading. Columns will not be allowed to interrupt the clear span of the firing range.

### 1.8.6 STEEL DECKING

The design and selection of steel deck shall be in accordance with the provisions of SDI 30. The designation of the steel roof decking type and gauge shall conform to SDI standards. Steel roof deck manufacturer's designations shall not be used. The minimum required section properties of
the steel roof deck shall be required to be specified or noted on the design drawings and shall be determined as prescribed by the appropriate specifications of SDI 30, the Steel Deck Institute Design Manual for Composite Decks, Form Decks and Roof Decks.

Steel deck designed to function as a shear diaphragm shall be designed in accordance with the provisions of the SDI DDMO3 "Steel Deck Institute Diaphragm Design Manual".

1.8.7 COLD-FORMED METAL FRAMING (CFMF)

1.8.7.1 Design

Design and detailing of wall systems using cold-formed metal framing (CFMF) members to anchor masonry veneers shall be in accordance with the provisions of ICC IBC. Wall systems shall be specified using the Cold-Formed Metal Framing Specification. Design assumptions and details shall be coordinated with the specifications. Cold-Formed Metal Framing shall be designed in accordance with AISI S100.

1.8.7.2 Cold-Formed Metal Framing Material

Cold-formed metal framing shall be formed from corrosion-resistant steel, corresponding to the requirements of ASTM A 653/A 653M. Structural members shall have a minimum yield strength, \( F_y = 33 \text{ksi} \).

1.9 LOCATION OF STRUCTURAL ELEMENTS

The structural design and corresponding selection and location of the structural elements shall be compatible with the floor and roof plans, and other information included in the RFP documents.

1.10 WALLS AND PARTITIONS

Exterior wall, window, and door assemblies shall meet the Antiterrorism/Force Protection (AT/FP) requirements of UFC 4-010-01. Interior non-structural partitions shall be constructed of steel studs and gypsum wallboard.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

-- End of Section --
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PART 2   NOT USED

PART 3   NOT USED

-- End of Section Table of Contents --
PART 1     INTERIOR DESIGN REQUIREMENTS

1.1 REFERENCES

The publications listed below shall be utilized for design of this facility to the extent referenced. The publications shall comply with the latest edition of the UFGS guide specification.

ASTM INTERNATIONAL (ASTM)


AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)


BUCKLEY AFB, CO

FEP (2014) Buckley Air Force Base Facilities Excellence Plan

IDG (2013) Buckley Air Force Base Installation Development Plan

CSA GROUP (CSA)


NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)


U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 3-120-01 (March 2014; Chg 2 October 2014) Design: Sign Standard

UFC 3-120-10 (June 2006; Chg 1 July 2007) Design: General Interior Design Requirements

UFC 3-600-01 (2016; with Change 1) Fire Protection Engineering for Facilities
1.2 DESIGN CRITERIA

The design of this building shall be in accordance with this document, NFPA 101, UFC 3-120-10, UFC 3-120-01 Design: Sign Standards, 36 CFR 1191, UFC 3-600-01, and Buckley Air Force Base FEP and IDG. All interior finish materials shall meet the flame spread and smoke development limits therein and the requirements of NFPA 101. Building and furniture finishes shall be durable and require minimum maintenance.

Reference the drawings for locations of finishes.

1.3 INTERIOR FINISHES

1.3.1 Ground and Polished Concrete

Ground and polished concrete shall be Grade 2 (salt and pepper finish), Class 2 (Medium Reflectivity, 800 grit). Concrete floor to have a Floor Flatness Factor of FF50 or better per ASTM E1155. Use a manufacturer approved grout filler to patch any voids that may have been exposed by the grinding process. Use a lithium densifier that chemically reacts to the concrete and fills holes and a sealant on floor slabs to provide a durable and easily maintainable finished surface.

1.3.2 Resilient Base

Base shall conform to ASTM F1861. Base shall be rubber, coved, 4 inches high and a minimum 1/8 thick. Job formed corners shall be furnished.

1.3.3 Transition Strips

Transition strips shall be provided where flooring termination is higher than the adjacent finished flooring and at transitions between different flooring materials. When transition strips are required at doors they shall be installed under door centerline. Transition strips are not required at doorways where thresholds are provided.

1.3.4 Ceramic and Porcelain Tile

Ceramic and porcelain tile shall conform to ANSI A137.1, moderate to heavy grade only. Porcelain tile and trim shall be glazed or unglazed with the color extending uniformly through the body of the tile and be 5/16" thick. Floor tile shall have a wet dynamic coefficient of friction (DCOF) value of 0.42 or greater when tested in accordance with ANSI A137.1 requirements.

1.3.5 Interior Signage

Signage must conform to 36 CFR 1191 (ABA-ADA), NFPA 101 and UFC 3-120-01 Design: Sign Standards. Provide signage for all rooms, including toilets, unless otherwise directed by the Contracting Officer. Provide tactile exit signs as required by NFPA 101. All signs with exception of those for toilets, mechanical, electrical and communications rooms, and exit signs
shall have a clear sleeve that will accept a paper insert, unless otherwise noted by the User. Provide paper and software for creating text and symbols by computer that allows the Owner to produce future replacement paper inserts. Provide building directories. Coordinate all signage requirements, including message content and room numbering, and placement with User and Contracting Officer.

1.3.6 Solid Surface Material

Solid surface material shall be provided for countertops, lavatories and window sills. Solid surface material shall be homogeneous filled solid polymer, not coated, laminated or of a composite construction, meet CSA B45.5-11/IAPMO Z124 requirements and be composed of cast 100 percent acrylic. Color and pattern must go through the thickness of the material. Countertops shall be a minimum of 1/2 inch thick material.

1.3.7 Shower Surrounds and Shower Pans

Solid surface material shall be provided for shower surrounds and shower pans. Shower surround and pan material shall be homogeneous filled solid polymer, not coated, laminated or of a composite construction, meet CSA B45.5-11/IAPMO Z124 requirements and be composed of cast 100 percent acrylic (basis of design - Corian) or a homogeneous compression molded material composed of acrylic resins or polyester/acrylic blend. Fire-retardant filler materials, fiber reinforcement and color agents (basis of design - Swanstone). Precast terrazo shower pans are also acceptable. Color and pattern must go through the thickness of the material.

1.3.8 Horizontal Blinds

Horizontal blinds shall be provided on exterior and interior windows, excluding vestibules and translucent panels. Blinds shall be Type II - 1 inch. Slats shall be aluminum and not less than .0070 thick. Intermediate brackets shall be provided for installation of blinds over 48 inches wide as recommended by the manufacturer. In addition to these requirements, blinds in rooms requiring room darkening shall also have light enhancing capabilities by means of hidden slat holes (ex: conference rooms, training rooms, etc.). Coordinate rooms requiring room darkening capabilities with the User.

1.3.9 Roller Window Shades - Bid Option

Provide window shades instead of horizontal blinds. Window shades to have a dual roller with light filtering shade cloths, AL-shaped fascia, manual operated chain drive, and roller tube shall operate smoothly and be of sufficient diameter and thickness to prevent excessive deflection. The shade cloth shall meet the performance described in NFPA 701, small scale test. Hardware shall allow for field adjustment or removal of shade roller tube and other operable hardware component without requiring removal of brackets and end or center supports. Analyze solar conditions when selecting shade fabric openness factors and coordinate shade openness factor with User. Window treatments must provide full coverage to reduce light leakage. Any window treatment must be flame-resistant and commercial quality. In addition coordinate rooms requiring shades for blackout or room darkening (ex: conference rooms, training rooms, etc.) with the User. Also coordinate with User if rooms, including offices, are used at night and will require privacy at night (some shades allow view of building interior at night).
1.3.10 Installation of Finishes

All finishes shall be installed as per manufacturer's recommended installation instructions, to include recommended equipment, adhesives and other related items. All finishes and related accessory components shall be furnished and installed for complete, functional and finished product installations.

1.3.11 Extra Materials

Extra material shall be provided for all finishes in minimum quantities of 2% to 5%. Required quantity shall be coordinated with the Contracting Officer.

1.4 COLOR

The word "color" as used herein includes surface color and pattern. Color selections shall provide an aesthetically pleasing, comfortable, easily maintainable and functional environment for the occupants. Coordination of interior and exterior building colors and finishes is necessary for a cohesive design. Color selection shall be appropriate for the building type. Limit the number of similar colors for each material.

Grout: Color of porcelain tile grout shall be a medium range color to help hide soiling.

Plastic Laminate and Solid Surfacing Material: Shall have patterns, except for sinks. Countertops at sinks shall be light to medium range in color to help hide water spotting. Dark color solid surface materials are not recommended since they show scratches more readily.

Accent Walls: Recommend the use of accent walls when appropriate to add interest.

Stained Woodwork: Shall match throughout the facility.

Miscellaneous Items: Finish colors of fire extinguisher cabinets, receptacle bodies and plates, fire alarms/warning lights, emergency lighting, and other miscellaneous items shall be coordinated with the building interior design. Color of equipment items on ceilings (speakers, smoke detectors, grills, etc.) shall match the ceiling color.

1.4.1 Color

1.4.1.1 Interior Finish Colors

Interior finishes and colors shall be coordinated with the User and BCE Office.

1.4.1.2 Exterior Finish Colors

Exterior finishes and colors shall be as referenced in Section 01 83 00 ARCHITECTURAL REQUIREMENTS.
1.5  FURNITURE

1.5.1  Furniture Design (FF&E)

Provide a FF&E and conform to the requirements of UFC 3-120-10 Design: General Interior Design Requirements. Items to be included in the FF&E package include furniture such as but not limited to desks, seating, classroom tables, storage, and podiums; these will be specified from the AF Contract and BPA's. Equipment such as appliances, waste receptacles, work tables, copier/printers will be provided by the User and will not included in the FF&E package. See drawings for further clarification as to what is considered furniture and equipment items. Coordinate furniture requirements, including product and function, with the User. Further refine the furniture requirements and layout as shown on the RFP drawings to comply with the User requirements; including items such as size of furniture, desk configurations, storage requirements, and finish material requirements. Also coordinate the size of the equipment items with the User so the furniture floor plan reflects correct sizes. Quality, function, aesthetics, comfort, safety and sustainability shall be considered in the selection of furnishings. Furniture styles, finishes and upholsteries shall be coordinated with the building design. Furniture package shall be designed in accordance with the Federal Acquisition Requirements, the User Requirements and the AF Contracting Office's procurement methodology. Coordination is required with AF Contracting Office to insure that the Furnishings Package is procurable. FPI and GSA market research shall be provided as required by the AF Contracting Office. Do not use COM fabrics.

1.5.1.1  Furniture Requirements

Materials shall be fire retardant to the maximum extent possible and U.L. listings shall be met where applicable. User friendly features shall be specified such as radius edges. Sharp edges and exposed connections are not acceptable. Clips, screws, and other construction elements shall be concealed where possible. Considerations shall be made to specify furniture with features that prevent damage from vacuum cleaners and maintenance products. Upholstery fabric shall meet Wyzenbeek Abrasion Test; 35,000 minimum double rubs, 50,000 preferred. It is recommended that heavier use areas have a minimum 50,000 double rubs. A topical or inherent soil retardant treatment is required. Upholstery fabric shall be patterned to help hide soiling. Vinyl, Crypton or hard surface material shall be used in heavy use areas as coordinated with the User and Corps Interior Designer. Coordinate specific furniture features and requirements with the User and Corps Interior Designer.

1.5.1.2  Furniture Layout

Furniture layout will be functional and coordinate with the building design to ensure that locations of electrical outlets and switches, communication outlets, and lighting within the building are appropriate. See drawings for proposed furniture layout. The layout will also be coordinated with other building features such as architectural elements, thermostats, location of TVs, etc. Show locations of and clearly indicate on the drawing if items are considered furniture or equipment items. Locate furniture and equipment items in front of windows only if the top of the item falls below the window. The furniture layout shall conform to requirements specified in 36 CFR 1191, and NFPA 101. Indicate on the drawings that the furniture and equipment items are not in this contract and will be purchased by others. See the paragraph on Furniture Design (FF&E) below for additional information.
1.5.2 Purchase and Installation

Furniture and equipment items will be purchased and installed by others under separate contract than the construction contract. The Government reserves the right to change the method for procurement of and installation of furniture to Contractor Furnished/Contractor Installed (CF/CI). CF/CI furniture will require competitive open market procurement by the Contractor using the Furniture (FF&E) package.

PART 2 NOT USED

PART 3 NOT USED

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PART 1 MECHANICAL REQUIREMENTS

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)


ASHRAE GUIDELINE 1.1 (2007) HVAC&R Technical Requirements For The Commissioning Process


ASHRAE Terminology Of Heating Ventilation, Air Conditioning, And Refrigeration

ASTM INTERNATIONAL (ASTM)


INTERNATIONAL CODE COUNCIL (ICC)


NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2017) National Electrical Code

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)


U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 1-200-01 (2016) DoD Building Code (General Building Requirements)
UFC 1-200-02 (2016) High Performance and Sustainable Building Requirements
UFC 3-310-04 (2016) Seismic Design for Buildings
UFC 3-400-02 (2003) Design: Engineering Weather Data
UFC 3-401-01 (2015 with Change 1) Mechanical Engineering
UFC 3-410-01 (2017 with Change 3) Heating, Ventilating, and Air Conditioning System
UFC 3-410-02 Lonworks (R) Direct Digital Control for HVAC and Other Local Building Systems, with Change 1
UFC 3-420-01 (2015 with Change 10) Plumbing System
UFC 3-600-01 (2016; with Change 1) Fire Protection Engineering for Facilities
MECHANICAL SYSTEMS CRITERIA

1.2.1 General Parameters/References

Mechanical systems, including HVAC systems, plumbing systems, heating and chilled water piping, equipment and building temperature controls shall be designed to comply with this chapter and the documents listed below to the extent referenced in this section. The publications are referred to in the text by basic designation only. The latest edition of the following standards and codes in effect and amended as of date of supplier’s proposal, and any subsections thereof as applicable, shall govern design and selection of equipment and material supplied:

American Society for Testing and Materials (ASTM) publications - ASTM A53/A53M.

American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), the following:

Guides:
ASHRAE GUIDELINE 1.1, The HVAC Commissioning Process;
ASHRAE GUIDELINE 13, Specifying Direct Digital Control

Handbooks:
ASHRAE HVAC APP IP HDBK, 2016 HVAC Systems & Equipment
ASHRAE HVAC APP IP HDBK 2015 HVAC Applications
ASHRAE HVAC APP IP HDBK 2014 Refrigeration
ASHRAE HVAC APP IP HDBK 2013 Fundamental

Practices:
ASHRAE Standards:
ASHRAE 15 & 34 Safety Standard for Refrigeration Systems
ASHRAE 52.2- Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size
ASHRAE 55, Thermal Environmental Conditions for Human Occupancy

ASHRAE 62.1-2010 Ventilation for Acceptable Indoor Air Quality

ASHRAE 90.1 - IP Energy Standard for Buildings Except Low-Rise Residential Buildings

ASHRAE 189.1 Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

ASHRAE Item 90376, Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems

IGSHPA (International Ground Source Heat Pump Association) Manual:
Residential and Light Commercial GSHP system Design and Installation Manual

U.S.GREEN BUILDING COUNCIL (USGBC):

Corps of Engineers Omaha District Design Guide (ODDG)

ETL 08-13, Engineering Technical Letter (ETL) 08-13: Incorporating Sustainable Design and Development (SDD) and Facility Energy Attributes in the Air Force Construction Program

ETL 11-18 Small Arms Range Design and Construction

Instrument Society of America Standard (ISA S75.01).

International Building Code (ICC IBC), 2015 (Refer to UFC 1-200-01 for correct usage)

International Energy Conservation Code (IECC) 2015 (Refer to UFC 1-200-01 for correct usage.)

International Mechanical Code (ICC IMC), 2015 (Refer to UFC 1-200-01 for correct usage)

International Plumbing Code (ICC IPC), 2015 (Refer to UFC 1-200-01 for correct usage)

National Electrical Safety Code, IEEE C2

NFPA 54, National Fire Codes (NFPA), with most current editions.

OSHA Safety and Health Standard (29 CFR 1910)

SMACNA - HVAC Systems - Duct Design

SMACNA 1966, SMACNA - HVAC Duct Construction Standard - Metal and Flexible

Underwriters Laboratories (UL 142), (UL 441)
1.3 MECHANICAL SCOPE OF WORK

The following provides the mechanical scope of work for this contract. Contractor shall provide for both design and construction requirements necessary to meet the mechanical scope of work. Any sizes, capacities or layout of equipment or systems provided as part of this scope of work shall be validated by the designer of record.

Design shall consist of heating, ventilating, air-conditioning (HVAC), load calculations, gas distribution sizing and layout to meet project requirements.

The room descriptions below shall take precedence over room discriptions of AF FC 4-179-03F if there are conflicts between description below and information in FC 4-179-03F.

1.3.1 Arms Range

The requirements for the arms range room are in AF ETL 11-18 and AF FC 4-179-03F. These requirements include providing laminar air flow at 75 fpm from behind the firing line traveling down range.

The air speed will be measured at 1 foot, 3 feet and 5 feet off the floor. Each lane shall have an average air flow between 60 fpm and 90 fpm. No single reading shall be under 50 fpm or over 110 fpm. The range average shall be between 72 and 78 fpm.

The ducting of the supply air shall have balancing dampers that allow the airflow to be balanced per lane.
The ventilation air supplied to the firing range will be unconditioned as required by AF ETL 11-18. The arms range shall be maintained at a negative pressure by exhaust 3% to 7% more air than. Exhaust air shall be taken from the space down range behind the bullet trap. The bullet trap shall also have a dedicated exhaust system. Gas fired radiant heating is to be provided to heat the area of the arms range from the firing line to the wall where the loading tables are located. The arms range ventilation air intake may be at any height and does not need to meet the ATFP requirement for air intake height.

The exhaust air shall be filtered with HEPA filtration.

The arms range ventilation system shall be manually turned on/off. The ventilation system shall be tied to the 'warning light' switch which indicates that live rounds are being fired. The fans for the ventilation system shall have a VFD or soft start system.

1.3.2 Control Booth

The control booth shall have an independant heating and cooling unit. The control booth has be supplied with outside air and positively pressurized in relation to the firing range.

1.3.3 Arms Vault

The requirements for the arms vault are in UFC 4-215-01. The arms vault shall have an independent heating and cooling unit. The room shall have exhaust and make up air. The room shall be maintained at a negative pressure relative to the surrounding spaces.

1.3.4 Weapons Maintenance Shop and Student Weapon Cleaning

Each room shall have an independent heating and cooling unit. Each space shall have exhaust. The location of the exhaust grill in the Weapons Cleaning room should be coordinate with location of the parts cleaning tank. The room shall be maintained at a negative pressure relative to the corridor.

Provide 4 compressed air drops in the Weapons Maintenance Shop and 4 drops in the Student Weapons Cleaning Room. Provide each drop with a pressure regulator, pressure gase, strainer and air cleaner. Locate the air compressor in the mechanical room. The air compressor shall be able to provide 15 cfm at 125 psi.

1.3.5 Vestibule

The vestibule shall provided with heating only. The heating shall maintain the space temperature above 55 degrees F.

1.3.6 Range Supplies

This space will have no heating or cooling.

1.3.7 Mechanical Room and Electrical Room

Theses spaces shall be heated to 55 degrees F. These spaces shall be cooled through the use of mechanical ventilation which shall operate when the space temperature is above 85 degrees F and the outside temperature is
lower than the space temperature.

1.3.8 Telecommunication Room

The telecommunication room shall have an independent DX ductless split system. The outdoor unit for the system shall be located inside the mechanical room. This allows the space to be cooled when the outside temperature is extremely cold and will not require the chiller to run when no other spaces require cooling.

1.3.9 General Office Space

The remaining spaces shall be treated as normal office space. Provided with heating and cooling and ventilation air. The ventilation system shall comply with applicable ATFP requirements.

1.3.10 General

The offices, Queuing Room, Issue Room, Break Room, Class Room, Observation Room, Weapon Simulator Room and corridors may be be supplied by a single air unit. Return air from these spaces may be mixed with other spaces.

1.3.11 Laundry Room

The Laundry Room space shall be exhausted at a minimum of 0.25 cfm/sqft. Air shall not be returned from this space. A dryer exhaust duct shall be provided. A booster fan will be required if the dryer exhaust duct is longer than 25 ft. (Each 90 degree turn shall be considered 5 ft.) If a booster fan is required, it should be located in an area easy to maintain and where it will be noticeable when it fails.

1.3.12 Restrooms and Janitor Closet

The Restrooms and Janitor Closet shall be exhausted. Air shall not be returned from these spaces. The heating and cooling system shall be able to provide heating and cooling during unoccupied hours when the exhaust system is off.

1.3.13 Heating, Cooling and Ventilation Design Requirements and Equipment Selection

The contractor shall perform heating, ventilation and air conditioning calculations to determine the HVAC loads for the building. Assume the peak number of personnel in the office area is one person per 100 square feet of floor area in occupied areas unless more accurate information is provided. HVAC loads for Communications Room shall be coordinated with end-user. Computer load calculations shall be provided and shall include complete input and output summaries, room load calculations, block load calculations and calculations for each system / air handling unit. Pre-approved computer load analysis programs are Hourly Analysis Program (HAP) by Carrier Corp., Trace 700 by Trane Corp., DOE-2 by US Department of Energy and EnergyPlus by DoD/DoE. If the designer wishes to use a different load analysis program, this shall be specifically listed in the proposal and requires approval by the Contracting Officer's Representative. Room air flow requirements shall be computed based on the individual room loads.

Design drawings and specifications shall be developed as required to meet the mechanical scope of work. This shall include locations of air handling units, boilers, pumps, chillers, fan coil units, ductwork, diffusers,
grilles, supply fans, exhaust fans, air intakes and exhausts, temperature sensors, heating and chilled water piping and condensate drain lines, as a minimum.

Equipment selections shall be made for all major pieces of equipment, including but not limited to, boilers, chillers, pumps, fan coil units, air handling units, supply fans, exhaust fans, air intake louvers or hoods, air exhaust louvers or hoods. Catalog data shall be provided as part of the design analysis to demonstrate that the selected equipment will meet the applicable operational and physical space requirements.

1.4 MECHANICAL SYSTEMS

The following provides direction for the mechanical systems.

1.4.1 Boiler

The heating shall be provided by 2 gas fired 95% efficient boilers. Boilers shall be provided with BacNet card option, stainless steel boiler core, 5:1 turndown ratio and selection shall account for the site altitude. (Buckley prefers Lochinvar). Provided pumps, chemical feeding (Buckley prefers Wessel brand feeders), air seperator, and all necessary ancillary items for a fully functional hot water hydronic system. Provide 2 boilers each sized for 2/3 of the total load. Provide 2 pumps that operate in a lead lag fashion each sized for 100% of the load.

1.4.2 Chiller

The cooling shall be provided with a chiller. Provided pumps, chemical feeding, air seperator, and all necessary ancillary items for a fully functional chilled water hydronic system. Provide 1 chiller. Provide 2 pumps that operate in a lead lag fashion each sized for 100% of the load. The roof area above the mechanical room will have a screen wall. The chiller is anticipated to be located on the mechanical room roof.

1.4.3 Energy Recovery

All exhaust (except from the Arms Range) shall be ducted to an energy recovery unit to temper the outside air. The outside air shall be ducted to the various fan coils so that the air balance achives the required positive/negative pressure requirements as stated in section 1.2 and provided the minimum outside air requirements of ASHRAE 62.1.

1.4.4 Fan Coils

All spaces (except for the Arms Range and Telecom Room) shall be conditioned by a 4 pipe fan coil unit or a hydronic heating only unit. Each space that requires an independant unit shall not allow the supply or return air to mix with other spaces.

1.4.5 DX Cooling

The Telecommunication room shall have a ductless split system with the outside unit located in the mechanical room.

1.4.6 Heating, Cooling and Ventilation Design Requirements and Equipment Selection

The contractor shall perform heating, ventilation and air conditioning
calculations to determine the HVAC loads for the building. Assume the peak number of personnel in the office area is one person per 100 square feet of floor area in occupied areas unless more accurate information is provided. HVAC loads for Communications Room shall be coordinated with end-user. Computer load calculations shall be provided and shall include complete input and output summaries, room load calculations, block load calculations and calculations for each system / air handling unit. Pre-approved computer load analysis programs are Hourly Analysis Program (HAP) by Carrier Corp., Trace 700 by Trane Corp., DOE-2 by US Department of Energy and EnergyPlus by DoD/DoE. If the designer wishes to use a different load analysis program, this shall be specifically listed in the proposal and requires approval by the Contracting Officer's Representative. Room air flow requirements shall be computed based on the individual room loads.

Design drawings and specifications shall be developed as required to meet the mechanical scope of work. This shall include locations of air handling units, boilers, pumps, chillers, fan coil units, ductwork, diffusers, grilles, supply fans, exhaust fans, air intakes and exhausts, temperature sensors, heating and chilled water piping and condensate drain lines, as a minimum.

Equipment selections shall be made for all major pieces of equipment, including but not limited to, boilers, chillers, pumps, fan coil units, air handling units, supply fans, exhaust fans, air intake louvers or hoods, air exhaust louvers or hoods. Catalog data shall be provided as part of the design analysis to demonstrate that the selected equipment will meet the applicable operational and physical space requirements.

1.5 GENERAL REQUIREMENTS

1.5.1 Design Considerations

1.5.1.1 Calculations

The design requirements shall include calculating the building heating and cooling loads and ventilation air quantities based on the indicated building occupancy, equipment loads, lighting loads and building envelope. Heat loss / gain calculations shall use actual building U-values. Heating and cooling calculations shall be provided by computer analysis i.e., Elite Software Inc., Trane Trace Load 700, Carrier E20-II Hourly Analysis Program (HAP) etc. The design shall also be economical, maintainable, energy conservative and shall take into account the functional requirements and planned life of the facility. Ease of access to components and systems in accordance with industry standards and safe working practices is a design requirement.

1.5.1.2 Mechanical Equipment Layout

The mechanical equipment layouts shall be provided with ample space to accommodate routine maintenance of equipment. Space provided for service and/or replacement of filters, coils, motors, and other equipment items shall be indicated with broken (dashed) lines and dimensioned on the contractor's drawings. Provisions for installation, removal, and future replacement of equipment shall be coordinated with the architectural design. The arrangement, selection, and sizing of all mechanical equipment shall be such that it can be broken down and removed from the building without dismantling any adjacent systems or structures.

The Contractor's drawings, specifications, design analysis and calculations
shall be provided as required for the 60 percent design and the Final design submittals in accordance Section 01 33 00.36 60 PERCENT DESIGN REQUIREMENTS, and Section 01 33 00.38 - 100 PERCENT DESIGN REQUIREMENTS. The as-built drawings shall be in accordance with Section 01 78 39.00 24, AS-BUILT DRAWINGS.

1.5.1.3 Mechanical Systems

Provide building mechanical systems, complete and ready for operation. The design and installation of all mechanical systems, including manufacturer's products, shall meet the instructions and requirements contained herein and the requirements of the referenced technical guide specifications. Where conflicts between these instructions and the guide specifications or above mentioned criteria exist, these instructions shall take precedence. Any installation requirements within these instructions, but not contained in the specifications, shall be added to the specifications or shown on the contractor's drawings.

1.5.1.4 Natural Gas

Selection of natural gas burning equipment shall take elevation correction factors into account. The btu content of the natural gas supply shall be confirmed with the Utility.

1.5.2 Installation Considerations

1.5.2.1 Mechanical/Electrical Equipment Coordination

Arrangement of all mechanical equipment and piping shall be coordinated with electrical work to prevent interference with electrical conduits. This shall include placement of mechanical equipment and electrical conduits in manner that the conduits do not restrict access to the mechanical equipment for maintenance, repair or replacement. Clearances required by NFPA 70 above and in front of electrical panels and devices shall be maintained. Mechanical equipment (pipes, ducts, etc.) shall not be installed OVER OR WITHIN SPACE which is dedicated to transformers, panelboards, or other electrical equipment unless items solely serve the area. When electrical equipment is located in a mechanical equipment space, the dedicated electrical space shall be indicated by a dashed line and noted "Electrical Equipment Space".

1.5.2.2 General Mechanical Requirements

As applicable, the following shall be provided for all mechanical systems:

a. All piping and equipment located in finished areas of the building shall be concealed or furred-in; exposed piping and equipment is only allowed in mechanical, equipment, and other rooms of this nature.

b. Provide isolation valves, balancing valve/flow measuring devices, and pressure/temperature test taps at the air handling unit coil(s) and at each fan coil unit. At each air handling unit coil provide supply and return water thermometers and a pressure gage valved to allow reading of supply or return water pressure.

c. All coils shall be provided with valved drain and air vent connections.
d. Air vents shall be installed on all high points in piping systems. Drain valves shall be installed at low points and at equipment which must be dismantled for servicing.

e. All vents, drain valves, and strainers which are located out of mechanical equipment spaces shall be provided with hose-end connections. All vents, drain valves, and strainers which are located within mechanical equipment spaces shall be piped to the nearest floor drain or floor sink.

f. Eccentric reducers shall not be used.

g. All pipe, ductwork and equipment supports and hangers shall be coordinated with the structure design to avoid possible overloading of any structural elements. Adequate pipe supports and hangers shall be used to prevent piping from imparting load to connected equipment.

h. Where steel flanges mate with cast-iron flanges, provide flat faces and full face gaskets.

i. Piping and supports shall not interfere with equipment maintenance access or pull space.

j. Dielectric unions shall be installed between dissimilar metals in soldered, brazed and threaded piping systems and insulated flanges shall be installed for welded systems.

k. Provide sufficient permanently installed instrumentation to aid maintenance personnel in balancing and/or troubleshooting mechanical systems. Instrumentation shall be provided in the media at each change in temperature and at all mixing points in hydronic piping. Pressure gauges, thermometers, flow indicators, etc., shall be installed to be easily read from the adjacent floor.

1.5.2.3 Vibration Isolation / Equipment Pads

Provide vibration isolation devices on all floor mounted or suspended mechanical equipment. All floor mounted mechanical equipment shall be provided with 6 inch housekeeping pads which extend 6 inches all around equipment provided.

1.5.2.4 Standard Products

Standard Products - Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall be essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted.

1.5.2.5 Utility Interruptions

Certain limitations on utility interruptions apply. Unauthorized utility interruptions will not be permitted. Any work that requires a utility
interruption shall be scheduled in advance. Outages are subject to postponement or cancellation by site authorities without prior notification. Coordination requirements of utility interruptions shall be in accordance with Document 00 73 00 SUPPLEMENTARY CONDITIONS (SPECIAL CONTRACT REQUIREMENTS). All utility interruptions shall be identified with notes on the project contractor's drawings and in the Contractors Phasing Plan.

1.5.2.6 Spare Parts

Proprietary spare parts lists that require more than a 60 day lead time, and/or any special service tools shall be provided to the Government prior to acceptance of the system.

1.5.2.7 Labeling

All ductwork, piping, and mechanical equipment shall be labeled in accordance with ANSI A13.1. Labels in the Mechanical Room and above ceilings shall be readable from the floor. Piping and ductwork shall be labeled at intervals no greater than 25 feet.

1.5.3 Design Conditions

The following conditions from the UFC 3-400-02, Design: Engineering Weather Data shall be used in designing the mechanical systems:

1.5.3.1 Site Elevation

Equipment design elevation is 5,660 feet above sea level.

1.5.3.2 Latitude

39.714° North

1.5.3.3 Longitude

104.744° West

1.5.3.4 Outside Design Conditions

Winter:
   a. -3°F.

   Summer:
   a. 90°F DB and 59°F MCWB.
   b. 90°F DB for air cooled equipment.

1.5.3.5 Inside Design Conditions

Winter:
   a. 70°F for all occupied areas including Corridors, Restrooms and Janitors Closets.
   b. 72°F for Communications Equipment Room.
   c. 55°F for Vestibules, Mechanical and Electrical Rooms.
   d. No set temperature for the Shooting Range. Provide radiant heating for area from the shooting line to the wall with the loading.
tables.

Summer:

a. 73°F for all human occupied areas including corridors, Restrooms and janitor closets.
b. 72°F for Communications Equipment Room.
c. Exhaust cooling for Mechanical and Electrical rooms when the space is above 85°F and the outside temperature is below the space temperature for.
d. Exhaust cooling for Mechanical and Electrical rooms when the space is above 85°F and the outside temperature is below the space temperature for.
c. No cooling in the Vestibules or Shooting Range.

1.5.3.6 Minimum Ventilation Requirements

All normally occupied spaces shall be mechanically ventilated in accordance with ASHRAE 62.1.

<table>
<thead>
<tr>
<th>Description</th>
<th>Ventilation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilets</td>
<td>50 CFM/water closet, Shower Stall and urinal exhaust (negative pressure)</td>
</tr>
<tr>
<td>Janitor's closets</td>
<td>1 CFM/square foot exhaust (negative pressure)</td>
</tr>
</tbody>
</table>

Range Supplies, Student Weapons Cleaning, Weapons Maintenance Shop and Arms Vault shall be negative pressure.

Arms Range                      | 75 fpm laminar flow across the shooting line. |
Mech. Equip. Room               | 10 air changes/hour exhaust for cooling |

1.5.3.7 Cooling Load

Lighting Coordinate with Electrical designer
Electrical Rooms Coordinate with Electrical designer
Owner Furnished Equipment /Simulator Coordinate with Electrical designer for load and location

1.5.4 Antiterrorism/Force Protection

Antiterrorism/Force Protection shall follow UFC 4-010-01.

1.5.4.1 Equipment Bracing / Supports

Overhead items such as suspended equipment that weighs greater than 31 pounds will be braced laterally as required by DoD Antiterrorism for Buildings Standard. Specifically, mountings will be designed to resist forces equal to 1.5 times the component weight in the downward direction and 0.5 times the component weight in any other direction. Support of equipment for antiterrorism/force protection shall comply with seismic protection requirements.
1.5.5 EQUIPMENT REQUIREMENTS

1.5.5.1 Equipment Identification

Provide a brass name tag for each valve, temperature control device, control system device (including but not limited to sensors, controllers, etc.), etc., installed in all mechanical. In addition, all mechanical equipment shall be clearly identified with a conspicuously located, permanent label. Mechanical equipment shall be identified by type and sequence number.

1.5.5.2 Identification of Piping

All exposed and concealed piping in accessible spaces shall be identified with color coded bands and titles in accordance with ANSI Standard A13.1, and the requirements of UFGS Section 09 90 00 PAINTS AND COATINGS.

1.5.5.3 Air Cooled Chillers

The chiller(s) shall be capable of providing adequate chilled water to meet the peak cooling requirement. The chiller shall be designed to operate with adequate level of propylene glycol / water mixture to prevent freezing of the solution at the winter outside air design temperature, and the standard conditions capacity rating shall be corrected for the use of this glycol mixture and the site elevation. The chiller shall have a minimum efficiency meeting the applicable requirements of ASHRAE Standard 90.1. The chiller shall be provided with the manufacturers standard hail and trash guards for physical protection.

1.5.5.4 Fan Coil Units

Fan coil units shall be concealed configuration with heating coil, cooling coil, disposable filter and condensate drain pan. Each fan coil unit shall be provided with a two-way, modulating heating coil control valve, a two-way, modulating chilled water control valve, a programmable controller and a room space temperature sensor with setpoint and space temperature display (at the temperature sensor.) Coils shall be selected for the required heating and cooling loads. The units standard conditions capacity ratings shall be corrected for the site elevation.

1.5.5.5 Chilled and Heating Water Pumps

The chilled and heating water pumps shall be base mounted, end-suction, centrifugal or pipe mounted, in-line centrifugal pumps, providing N+1 redundancy to allow replacement of a failed pump while the system is running at full load. The pumps shall comply with the requirements of UFGS Section 23 64 26. Pumps shall be sized for 110 percent of the maximum required water flow and 110 percent of the maximum system head pressure. Pumps shall be non-overloading allowing the pump to operate at any point on its characteristic curve. Pumps shall be provided with flexible connectors, check valve, pressure gage, P & T test ports and isolation valves. Where required, base mounted, end suction pumps shall be provided with neoprene bellows type expansion compensation. Base mounted pumps shall be provided with a suction diffuser or adequate straight pipe at the pump suction inlet and shall be mounted on a 6 inch thick concrete housekeeping pad. Suction diffuser shall be provided with floor support leg to keep weight from being transferred to pump. Each pump shall be provided with a variable frequency drive controlled by the building HVAC control system.
1.5.5.6 Hot Water Boilers

Boilers shall be natural gas fired, high efficiency (minimum efficiency of 91% at the design heating water return temperature), low NOx, condensing boilers, suitable for operation with the required glycol / water mixture and shall include factory installed safety and operating controls. Boilers shall be provided with a communication card allowing communication between the boiler control system and the facilities HVAC control system. The boiler shall be designed to prevent thermal shock at a return water temperature as low as 70 degrees F. The boiler system shall include a manual shut-down button in accordance with ASME CSD-1.

1.5.5.7 Glycol Feed System

Each hydronic system (heating water and chilled water) shall be provided with an automatic glycol feed system. The system shall include a minimum 50 gallon glycol / water tank, supply pump, controls and connecting piping. Each system shall include level alarms for high level, low level, low low level. The glycol system controls shall monitor the pressure in the associated hydronic system and shall activate the pump upon a drop in pressure in the hydronic system. The glycol system controls shall interface with the building HVAC control system. Operation of the pump shall provide a warning input to the building HVAC controls system. The building HVAC control system / Base EMCS shall monitor the level alarms.

1.5.5.8 Arms Range Ventilation

The range ventilation will be composed of various fans and filters. The ventilation will not be heated or cooled. The exhaust will require at least 99.97 (HEPA) @ 0.03 micron filtration. Exhaust will be taken from the bullet trap and from the space behind the bullet trap. The combined exhaust cfm shall be greater than the ventilation air cfm to create a negative pressure relative to the surrounding spaces.

1.6 SEISMIC PROTECTION FOR MECHANICAL PIPING, DUCTWORK, AND EQUIPMENT

This section contains instructions and engineering requirements relating to the seismic protection design of mechanical piping, ductwork, and equipment. Structural bracing and mounting of mechanical piping, ductwork, and equipment shall be designed in accordance with UFC 1-200-01, UFC 3-310-04, UFGS Section 13 48 00 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT, and UFGS Section 13 48 00.00 10 SEISMIC PROTECTION FOR MECHANICAL EQUIPMENT.

1.6.1 Piping

Piping within the facility, except fire protection piping, is required to have seismic restraints complying with UFC 1-200-01, and UFC 3-310-04.

1.6.2 Ductwork

Ductwork within the facility is required to have seismic restraints complying with UFC 1-200-01, and UFC 3-310-04.

1.6.3 Miscellaneous Equipment

Miscellaneous items which consist of a number of individual components built into an assembly by the manufacturers may require additional internal reinforcements to meet the requirements of UFC 1-200-01, UFC 3-310-04 and
UFGS Section 13 48 00 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT.

1.7  THERMAL INSULATION OF MECHANICAL SYSTEMS

Insulation of hydronic water piping systems and equipment, and the insulation of the duct systems shall meet the more stringent of ASHRAE 90.1, ASHRAE 189.1 or UFGS Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Heating piping in heated spaces and conditioned spaces shall be insulated. Hydronic water piping shall be required to follow tabulated thicknesses. All heating and air conditioning supply and return ducts shall be insulated.

1.7.1  Insulation Covers

Provide reusable insulation covers at all check valves, control valves, strainers, filters, or any other piping component requiring access for routine maintenance. Exposed insulation up to six (6) feet above the finished floor shall be covered by an embossed aluminum metal jacket or PVC jacket. All piping with jacket shall be identified on the contractor’s drawings.

1.8  PLUMBING SCOPE OF WORK

1.8.1  Description of Plumbing Systems

The plumbing systems consist of the domestic cold and hot water supply and distribution system (including domestic hot water recirculation), reduced pressure type backflow preventers, condensate drain lines from air handling unit(s) and/or fan coil units and boilers, domestic water heaters, fixtures, sanitary system, soil, waste, and vent systems and extends from connections within the buildings to a point 5 ft outside of each building. The design of all plumbing systems will comply with the ICC IPC, UFC 3-420-01 and Technical Specification UFGS 22 00 00 PLUMBING, GENERAL PURPOSE.

The plumbing systems shall be fully designed and installed. All items shown or referenced indicate intent, type, minimum quantity and/or locations required. All calculations, sizing and design to achieve complete and operational systems shall be the responsibility of the Contractor. All distribution systems (such as storm piping, sanitary sewer and vent piping, domestic water piping, etc.) shall be developed by the Contractor.

The plumbing design shall provide domestic hot and cold water to the various plumbing fixtures and water makeup to the various hydronic type environmental control systems (i.e. expansion tanks, boilers, etc.) Backflow preventers shall be provided on all makeup water systems. A water meter shall be provided inside each mechanical room as part of the water service entrance. Water at the site will be categorized in accordance with UFC 3-420-01 and the pipe materials for the domestic hot and cold water systems selected accordingly. Steel pipe shall not be used as part of the domestic hot or cold water piping systems. The plumbing system shall also include drains, natural gas fired water heaters, sanitary waste and vent piping, storm drainage piping, natural gas piping, pipe insulation and pumps. Design calculations on water and sewer line capacities shall be submitted by the DB contractor with the Design Build package. Plumbing systems shall be insulated per specification Section UFGS 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS.
1.8.2 Sanitary Drainage and Vent System

The sanitary drainage system shall be designed and installed per the 2015 ICC IPC.

Sanitary soil/waste piping shall slope a minimum of 1/8 in. per foot. All vent piping shall be installed to grade back to the soil or waste piping. Vent pipe extensions through the roof shall be located to be a minimum 20 ft away from any intake openings on the building or on mechanical equipment. Provide properly sized vent headers as required to coordinate the location of vent terminals with intakes or relief penthouses.

1.8.3 Domestic Water Systems

The domestic water service shall be coordinated with the site water system. Coordinate service entry locations with civil drawings. Conduct a flow test to determine the current characteristics of the water service in terms of the flow rate and pressure.

The domestic water system shall be assessed to determine if the system will require booster pump(s) to provide the required pressure required for plumbing fixtures to function properly. A residual pressure of 25 psig must be available at the most hydraulically remote fixture in each building.

The domestic water system must be protected from backflow and back siphonage by code complying air gaps or reduced pressure principle backflow prevention devices listed in accordance with the Foundation for Cross-Connection Control and Hydraulic Research.

Provide an automatic domestic water softening system in each building. Both domestic hot and cold water shall be softened at all fixtures except kitchen faucets and wall hydrants.

Water piping shall be sized based on a maximum velocity of 8 FPPS for the maximum design flow rate.

Domestic hot water will be produced by a gas fired-water heater(s) with a separate hot water storage tank located in each mechanical room. Hot water heaters shall be high efficiency, sealed combustion, condensing type with independent intake and discharge. Each building's domestic hot water system shall include a domestic hot water recirculating pump and domestic hot water recirculating piping. Provide a master mixing valve to deliver hot water at 110 degree F. to break room sink, 120 degrees F. to laundry area and janitor's mop sink. Tepid water should be delivered to stainless steel shop sinks, lavatories and face/eyewash, and showers to prevent limitation on hot water used as hot water causes the pores to open creating possible lead poisoning. The domestic hot water heater shall be sized based on a 140 F storage temperature and heater capacity equal to the probable maximum demand of all fixtures served.

Provide flow limiting measuring devices to prevent high velocity water flow damage to recirculation piping (AutoFlow Griswold).

The domestic water systems shall be installed to eliminate air to water shock waves within the piping system.

1.8.4 Natural Gas System

Provide necessary pressure regulators and associated vent lines for all
gas-fired equipment. Size interior gas piping on a maximum pressure loss of 0.5\" w.g. for the developed length of piping based on gas with specific gravity of 0.6. Piping system design shall be based on the calorific value of natural gas at the site. Underground piping will be plastic up to the building and transition to metal piping above grade.

1.8.5 Meters

Water meter shall be provided with a direct non-resettable, digital readout. Meter shall have a pulse switch initiator capable of a pulse output of operating up to speeds of 500 pulses per minute with no false pulses and shall require no field adjustments or 4-20 mA output. Initiators shall provide the maximum number of pulses up to 500 per minute that is obtainable from the manufacturer. Meter shall be connected to the Base wide EMCS in this contract.

1.8.6 Water Hammer Arresters

Commercially available water hammer arresters shall be provided at all new quick closing valves such as solenoid valves and shall be installed according to the manufacturer's recommendations. Vertical, capped pipe columns are not permitted.

1.8.7 Plumbing Fixtures

All plumbing fixtures shall comply with this section and UFGS Section 22 00 00 PLUMBING GENERAL PURPOSE. End-point devices shall meet lead leaching requirements of ANSI/NSF 61, Section 9, such as lavatory faucets, kitchen and bar faucets, residential refrigerator icemakers, supply stops and endpoint control valves. In-line devices, such as drains and backflow preventers, do not have to meet ANSI/NSF 61, Section 9. Plumbing fixtures shall conform to ASME standards with lead-free faucets. Fixtures shall meet the operational and dimensional requirements of ASME A112.19.2M and be provided with CP brass trim and individual stop valves. Fixture types shall meet the USAFA Design Guide, Paragraph 5.6.9.2 requirements. Maximum flowrates shall be as follows:

- **Water closets**: 1.28 gallons per flush
- **Lavatories**: 0.5 gallons per minute
- **Showers**: 1.5 gallons per minute
- **Kitchen sinks**: 1.75 gallons per minute
- **Urinals**: 1.28 gallons per flush

**WATER CLOSETS:**

Water conservation water closets (low flow type) conforming to the UFGS Section 22 00 00 PLUMBING GENERAL PURPOSE shall be provided. Water closets shall be floor mounted with elongated bowl and open-front seat. Water closets shall be white. Water closets shall be automatic flush valve type.

**LAVATORIES:**

Water conservation lavatories conforming to UFGS Section 22 00 00 PLUMBING GENERAL PURPOSE shall be provided. Lavatories shall be vitreous china, wall-hung type as specified in the architectural section and as shown on the RFP drawings and shall be provided with single control mixing-type automatic faucet.
Lavatories and water closets shall be provided with manually operated flush valves and faucets. Electric water coolers shall be bi-level water coolers if provided. Provide fixtures meeting the requirements of the Architectural Barriers Act. Lavatory faucets shall deliver maximum 105°F water. Lavatories shall be molded resin, grid drain outlet, offset p-trap, temperature regulating faucet, stops and insulated supply and drain. Water closets to be tank type water closets.

**SHOP SINK:**

Shop sinks in the Weapons Maintenance Shop and the Student Weapons Cleaning shall be furnished with service sink faucet. Provide sediment trap below fixture.

**EMERGENCY EYE/FACE WASH:**

Shall be provided with tempering valve.

**SHOWER:**

Provide shower with pressure balancing shower fitting with push button hand spray and hose.

**URINAL:**

Provide wall mounted urinal with low flow and sensor controlled.

**MOP SINK:**

Provide mop receptor with heavy duty faucet.

**WASHING MACHINE:**

Provide washing machine connector box for clothes washer.

### 1.8.8 Building Domestic Water

Domestic cold and hot water piping shall be insulated Type-L copper, above grade. Below grade piping shall be Type K soft drawn. Approved backflow preventer shall be provided for make-up water service to HVAC equipment. An approved backflow preventer shall be provided on the domestic water supply to the building. Water piping shall be sized so that velocities will not exceed 8 FPS. All major branches shall have isolation valves to facilitate maintenance. Each floor shall have hot & cold water isolation valves and excess panels.

### 1.8.9 Building Waste and Vent System

Waste and soil lines shall drain by gravity to the site sanitary system. Vents through the roof shall be increased two pipe sizes for frost closure and insulated for 15 ft from the roof to eliminate condensation. Condensate rim floor drains with bucket strainers shall be provided for HVAC equipment condensate drains.

### 1.8.10 Wall Hydrants:

Freeze proof wall hydrant with key access shall be provided in the building exterior walls. Spacing shall comply with the requirements of UFC 3-420-01.
1.8.11 Floor Drains

Floor drains shall be provided in mechanical room, restrooms and in washer and dryer areas. Trap primers shall be provided on each floor drain.

1.8.12 Plumbing Vents

Where feasible, combine vents in a concealed space to a main vent through the roof in lieu of an excessive number of individual vents through the roof. All vent lines through roof shall terminate a minimum of 6 inches above finished roof. Where vents connect to horizontal soil or waste lines, the vent shall be taken off so that the invert of the vent pipe is at or above the centerline of the horizontal soil or waste pipe.

1.8.13 Plumbing Building Design Calculations

Design Calculations: The Building Design Calculations, and Plans shall be in accordance with 01 33 00.36 "60 PERCENT DESIGN REQUIREMENTS" and all other requirements of the RFP. Provide as a minimum the following plumbing design calculations:

Building water supply demand for inlet pipe sizing
Building sanitary drainage load for discharge pipe sizing
Domestic hot water heaters capacities.
Interior gas piping system
Pump Selections
Water Heater Selections

1.9 HYDRONIC PIPING REQUIREMENTS

1.9.1 Piping Layout

All piping shall be pitched up in the direction of flow, shall be designed without pockets that would permit accumulation of air, and shall be provided with air vents at high points and drains at low points. Piping shall be routed in the space between the suspended ceiling and the floor/roof above.

1.9.2 Pipe Sizing

Pipe sizing friction loss shall be based on the following:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Maximum Velocity</th>
<th>Maximum Pressure Drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 2&quot;</td>
<td>4.0 ft/sec</td>
<td>4.0 ft./100 Lft</td>
</tr>
<tr>
<td>2 1/2&quot; to 6&quot;</td>
<td>5.5 ft/sec</td>
<td>2.5 ft/100 Lft</td>
</tr>
</tbody>
</table>

1.9.3 Pipe Materials

All heating or cooling water piping within the facility shall be black steel conforming to ASTM A53, Schedule 40 or copper as specified in UFGS Section 23 52 00 HEATING BOILERS or 22 64 10 Water Chillers, Vapor Compression Type.

1.9.4 Pipe Joints

Heating or cooling water pipe joints shall be of the following types:

a. Piping installed within the facility shall utilize threaded,
brazed, or welded joints.

b. Connections to equipment shall utilize unions for pipe 2 inch and smaller and flanges for pipe 2 1/2 inch and larger.

1.9.5 Pipe Expansion

In runs of pipe 50 feet and longer, or in shorter runs where required, indicate on project drawings the location of all anchors, bends, loops, expansion joints and pipe guides to adequately limit and provide for pipe expansion. Do not use expansion joints in piping unless absolutely necessary and justified. Where expansion joints are used they shall be the bellows type. Slip joint type expansion joints shall not be used. Anchors and guides shall be indicated on the project contractor's drawings and detailed for installation in the building structure provided.

1.9.6 Isolation Valves

Isolation valves shall be provided at each piece of equipment served by the hydronic piping system and shall be provided in each connection to the hydronic system (i.e. supply and return.) Valves shall be manual and shall allow isolation of the equipment from the piping system in order to allow for repair or maintenance of the equipment without affecting the remainder of the hydronic system. As a minimum, isolation valves should be provided for the chiller, pumps, heat exchanger, fan coil units and air handling unit.

1.10 EXTERIOR GAS DISTRIBUTION SYSTEM

This Section contains instructions and engineering requirements relating to the design of the exterior natural gas distribution system where required, including the building gas service line and gas service regulator assembly. The gas distribution system shall be designed in accordance with NFPA 54, and shall meet the requirements of UFGS section 33 51 15 Natural-Gas / Liquid Petroleum Gas Distribution. Gas main shall remain operational during construction.

1.10.1 Service Line Sizing

The size of the service line shall be sufficient to supply the peak gas demand for the complete facility without excessive pressure drop and shall not be less than 1 inch in size.

1.10.2 Service Line Materials

All above ground lines shall be steel.

1.10.3 Gas Meters

A gas meter shall be provided as part of the service regulator assembly when the existing meter is found to be inadequate. The meter shall be provided with a direct non-resettable readout. The meter shall produce an output compatible with the building HVAC control system and Base EMCS. The gas meter shall be sized to handle the peak gas demand for the complete facility. The gas meter shall be located in an inconspicuous location so as not to be visible from the front entrance to the facility. If this is not possible the meter shall be hidden by shrubs or a screen wall. Meter shall have tele-metering capability. Meter is required in accordance with UFC 1-200-02 Change 4, Energy Conservation(and compatible with the Base
1.11 INTERIOR GAS PIPING SYSTEM

The interior gas piping system shall extend from the outlet of the meter set and service regulator assembly to the point of connection of each gas utilization device. The aboveground gas piping system shall be steel, designed in accordance with NFPA 54 and shall meet the requirements of UFGS section 23 11 25 Facility Gas Piping.

1.11.1 Gas Pipe Sizing

Piping shall be sized in accordance with NFPA 54. Minimum interior gas pipe size shall be 3/4 in. The heating value of the natural gas to be used in calculations for sizing equipment and piping is 1000 Btu per cubic foot. Gas piping shall be shown on the Plumbing Drawings of the contractor's drawings.

1.11.2 Equipment Connections

The final connection to gas equipment shall be made with rigid metallic pipe and fittings or flexible connectors. Accessible gas shutoff valve, 6 in long full-size dirt leg, and coupling are required.

1.12 AIR SUPPLY AND DISTRIBUTION SYSTEM

The design of all systems shall comply with the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbooks, to the requirements of NFPA 90A and the requirements of UFGS Section 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS.

a. Equipment capacities and flows shall be corrected for altitude on project contractor's drawings, and shall be identified as such on the contractor's drawings.

b. Minimum outdoor air ventilation rates shall be provided for occupants and spaces by mechanical ventilation system as required by ASHRAE 62.1.

c. Noise Criteria shall be in accordance with the following Noise Criteria (see ASHRAE HVAC APP IP HDBK), unless otherwise indicated, as follows:

1. Office = 20 NC (max)
2. Restrooms = 30 NC (max)

1.12.1 Ductwork

Supply air duct systems for shooting range ventilation shall have a class A seal requirements as established by SMACNA. All other duct shall be built to low pressure classification (minimum of 2 inches) and class C seal requirements, and shall be sized using the equal friction method with 0.08 inches of water column per 100 feet for supply, return, and exhaust ducts and 0.05 inches of water column per 100 feet for transfer ducts. Ductwork shall be metal, except for fan connections, and shall be constructed in accordance with SMACNA Guidelines. Ductwork shall be run above the ceiling. Flexible ductwork shall never exceed 5 feet in length. Return air shall be ducted.
1.12.2 Grilles, Registers and Diffusers

1.12.2.1 Ceiling Mounted Supply Diffusers

a. Ceiling diffusers used with the fan coil distribution system shall be louvered face architectural square panel type. Diffusers shall be provided with a 4-way discharge pattern. Maximum diffuser size shall be limited to 24in x 24in and minimum size shall be 12 in x 12 in. Diffusers in rooms with windows shall be located in such a way that the windows are wiped with air from the diffusers.

b. Diffusers shall be suitable for use in a lay-in ceiling or a gypsum board ceiling as necessary. Diffusers shall be sized to distribute the required quantity of air evenly over the space intended without causing noticeable drafts, air movement faster than 50 feet per minute in the occupied zone, or causing dead spots anywhere in the conditioned space at variable air flow rates of 40% to 100% of the maximum air flow rate. Diffusers shall be sized and selected based on a maximum velocity of 500 feet/minute, a maximum NC of 20 in all spaces, and a maximum pressure drop of 0.1 in W.C.. Individual diffusers shall not exceed 420 CFM.

c. Elbow immediately upstream of ceiling diffusers shall be sheet metal. Flex duct at this location is not allowed to be used as an elbow.

1.12.2.2 Ceiling Mounted Return and Transfer Grilles

Ceiling return air grilles shall be egg crate or perforated type suitable for use in lay-in ceilings or gypsum board ceilings, and shall be located to prevent air stratification at the wall mounted temperature sensor location. The maximum size of grilles shall be 24 in x 24 in and the minimum size shall be 12 in x 12 in. Each grille shall be provided with a return air boot. Individual grilles shall be sized and selected based on a maximum air flow of 1000 CFM, a maximum pressure drop of 0.05 in W.C., and a maximum NC of 20.

1.13 VENTILATION AND EXHAUST SYSTEMS

The design of all systems shall comply with the ASHRAE Handbooks, ASHRAE Standard 62.1, NFPA Standards No. 90A and shall meet the requirements of UFGS Section 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEMS.

1.13.1 Exhaust Fans

Exhaust fans shall be in-line centrifugal type. Care shall be taken to ensure that the noise level generated by exhaust fans is not transmitted to the interior of the building. Sone value of fans measured five feet from fan inlet shall be less than 20 Sones. Sound transmission data shall be submitted for approval and design shall indicate noise criteria on schedules.

1.13.2 Ceiling Mounted Exhaust Grilles

Ceiling mounted exhaust grilles shall be similar to ceiling mounted return and transfer grilles. Grilles shall be provided with manual volume dampers located in the ductwork along with concealed damper regulators in areas with gypsum board ceilings. The minimum neck size of grille shall be 8 in. x 8 in.
1.14 BUILDING TEMPERATURE CONTROL SYSTEM

The temperature controls (HVAC controls) system for the Building #347 shall be direct digital controls (DDC) and shall be tied into and fully integrated with the existing Installation wide energy management and control system (EMCS). Provide a distributed logic control system complete with Direct Digital Control (DDC) and Direct Analog Control (DAC) software. System shall be totally based on BACnet ASHRAE Standard 135-2012. This system is to control all mechanical equipment, including air handlers, heating equipment, fans, pumps, and other specified equipment, directly without intervening electric, analog electronic, pneumatic or other non-BACnet compliant controls. The communication network between controllers must be conform to BACnet and communicate at a minimum of 156kbps. All controller enclosures shall be NEMA 4. The ASHRAE BACnet over ARCnet standards have been adopted by and shall be utilized at F.E. Warren AFB.

The system must use BACnet as the native communication protocol between distributed controllers communicating on the controller network (i.e. Field Bus) and must, as a minimum, be Conformance Class 3. Non-BACnet-compatible or proprietary equipment or systems (including gateways) shall not be acceptable and are specifically prohibited. The building BACnet 156kbps communication trunk shall be provided by the temperature control contractor and shall be connected via a control contractor provided Ethernet to BACnet router/bridge to the base wide Ethernet/Fiber Optic Network. Connection to the existing Central EMCS BACnet workstation, located in Building #363 shall be by the base network as described above and is included as part of this project scope. Access to the building HVAC control system by the Base EMCS operator shall be seamless via the EMCS operator work station.

The complete system, including, but not limited to terminal unit controllers, global controllers and operator's terminals shall auto-restart, without operator intervention, on resumption of power after a power failure. Database stored in global controller memory shall be battery backed up for a minimum of 1 year. All other logic controllers shall utilize Electronically Erasable Programmable Read Only Memory (EEPROM) for all variable data storage.

The design of the control systems for the HVAC equipment shall be in accordance with UFC 3-410-02 Design - Heating, Ventilating and Air Conditioning (HVAC) Control Systems and UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings, includes Change 1. Installation shall be in accordance with UFGS 23 09 23.13 20 BACnet Direct Digital Control Systems for HVAC. The control system shall be designed to provide continuous and automatic control of all HVAC equipment indicated in this specification section. Where equipment is provided with a packaged control system, as in the case of chillers, the building control systems shall interface with the equipment's packaged control systems. The temperature control panels shall be located in the mechanical room. The number of control panels shall be dictated by the number of and types of equipment in the final design. The control system shall allow the EMCS operator to easily adjust setpoint, operating times and other system parameters, if and when necessary, once the building control system has been integrated into the EMCS.

1.14.1 General DDC Requirements

All mechanical systems and equipment, shall be controlled by local direct digital control (DDC) equipment located in the facility's Mechanical room.
or at the equipment. The DDC system shall be capable of operating in a
stand alone fashion. To facilitate maintenance and to allow manual
starting and stopping of equipment by maintenance personnel, a hard-wired
Hand-Off-Automatic control switch shall be provided for each air handling
unit, pump and exhaust fan.

a. Temperature Control Contractor Experience - The temperature control
Contractor shall have a minimum of 5 years experience installing DDC
systems. The Contractor shall provide for approval the names and
qualification of supervisory personnel (i.e., Project Manager and/or
Superintendent) that will be used on this project. The Contractor shall
also provide a list of references to be contacted from recent projects on
which the proposed personnel performed similar duties. Approval shall be
based on previous experience with the DDC system to be installed,
qualifications and demonstrated ability of proposed personnel to manage
resources in an efficient and effective manner. Experience and supervisory
personnel qualifications must be submitted and approved before submittal of
any technical data.

b. Emergency Service During Warranty - The Government will initiate
service calls when the installed DDC/EMCS is not functioning properly.
Qualified personnel shall be available to provide service to the complete
DDC/EMCS installed under this project. Qualified personnel shall be defined
as a factory trained journeyman in the brand of control system provided,
this level of training shall be considered a minimum. The Government shall
be furnished with a telephone number where the service supervisor can be
reached at all times. Service personnel shall be at the site within 3 hours
after receiving a request for service. The control system shall be restored
to proper operating condition within 3 calendar days after receiving a
request for service.

c. Software - Equipment shall be provided "plain" with no control
modules. A low voltage terminal strip with Y, W, R, G, etc. shall be
installed so the equipment can be wired for control through the local EMCS.
All BACnet controllers shall utilize and operate exclusively under the
control of the existing F.E. Warren EMCS ALC software package. Inputs and
outputs shall be adjustable and the programming can be revised via the
existing local ALC software. This ALC software suite includes Web Control
graphical control software, ALC graphic programming and ALC Draw packages.
All DDC panels shall be graphically programmed only from the existing ALC
Eikon graphical program software package and system operating graphics will
be generated using ALC Draw software programs. No other software packages
will be allowed on the EMCS workstation other than the existing ALC
software suite above and no new or additional EMCS workstations will be
permitted on the base network.

d. Fuses shall not be used for surge protection. Provide transient voltage
surge suppression (TVSS).

e. Scheduled inspections shall be at the beginning of construction.

f. System descriptions and analyses submittal shall indicate how the new
system will interface with the existing EMCS.

1.14.2 Alarm Monitoring

Alarm monitoring shall be provided for all major pieces of equipment.
Indication of failure shall alarm at the EMCS Operators work station. The
maximum allowable time for the EMCS to display an alarm condition is 10
seconds starting from the time the alarm condition first exists. The maximum allowable time for equipment to respond to manual EMCS commands is 10 seconds starting from the time the command is initiated at the work station. Alarm monitoring shall include, but not limited to the following alarm indications:

1) Loss of Flow
2) High and low temperature
3) Chiller and Boiler General Alarm
4) Gycol feed system level alarms
5) Start/stop actual status different from commanded state

1.14.3 Stand-Alone Operation

The control system / equipment installed as part of this contract shall be fully capable of stand-alone operation on a continuous basis. All programs, including those based upon real-time clock or calendar events, shall reside in the local DDC equipment.

1.14.4 Input/Output Devices

The control system shall utilize off-the-shelf input and output instruments (e.g., RTD sensors, space temperature sensors, actuators) which are commercially available from third party vendors and who are independent from the DDC system manufacturers. All sensing devices shall be capable of removal from the system without disruption of service to the system in which they are installed.

1.14.5 Cable and Wiring

Cable and wire for the DDC system shall be separate from the distribution system serving any other system. All cable and wiring shall be installed in conduit. The data transmission media (DTM) shall be provided by the Contractor. The Contractor shall provide data transmission media (DTM shall be as specified and extended as on the contractor's drawings in accordance with Section 01 86 26 ELECTRICAL REQUIREMENTS.

1.14.6 Control Valves

Sizing of control valves shall take into account upstream and downstream fittings and shall be in accordance with Instrument Society of America standard ISA S75.01-1985.

1.14.7 Control Dampers and Actuators

The air handling units and exhaust fan shall be provided with low leakage dampers and 0-10 vdc operated electronic damper actuators. Low leakage dampers shall have a maximum leakage rate of 3 CFM/SF with a differential pressure of one inch of water gage across the damper. Damper position feedback is required.

1.14.8 Valve Actuators

All valves shall be provided with 0-10 vdc-operated valve actuators.

1.14.9 HVAC Control Drawings

The HVAC control contractor's drawings, for both the 60 percent and Final submittals, shall be in accordance with SECTION 01 33 00.36 - 60 PERCENT
DESIGN REQUIREMENTS, & SECTION 01 33 00.38 - 100 PERCENT DESIGN REQUIREMENTS. Control contractor's drawings for the building shall include a system schematic section, a detailed sequence of control, a list of required components with a brief description of each component, legend and schedules, a listing of input and output points and a matrix showing the point type, alarms and applications programs associated with each of the input or output points. EMCS details and points to be monitored shall be detailed on the drawings and follow the conventions as set forth in UFC 3-410-02. System I/O summaries shall be detailed.

1.14.9.1 Control Schematic

The control schematic shall be a schematic representation of the HVAC system and the associated control equipment. The control schematic shall be drawn to a large scale to allow for ample space to indicate any necessary performance parameters such as setpoint, etc. Each component shall be identified by a unique alpha-numeric designator such as Sl for sensor number 1. This provides a means of cross referencing to the description of components and the sequence of control. All major control items relative to the system shall be shown. This may include, but shall not be limited to:

- Air Handlers
- Fan coil units
- Boilers
- Cooling Coils
- Heating Coils
- Freezestats w/manual reset
- Smoke Detectors w/connection to the FACP
- Temperature Sensors
- Valves and Valve Actuators
- Dampers and Damper Actuators

1.14.9.2 Sequence of Control

The sequence of control is a written statement of the operation of the system. It should be as detailed and complete as possible and it should refer to individual components by their alpha-numeric designator whenever possible. The sequence shall break the overall system into sub-systems, such as supply fan control, mixed air control, heating control, cooling control, etc., and shall describe the operation of each of the subsystems. The sequence of control shall also describe the operation of all safety devices such as smoke detectors or freezestats, fire alarm interlock and shall describe the operation of the system in both the occupied, warm-up and unoccupied modes.

1.14.9.3 Description of Components

The description of components shall provide a generic description of the performance of each component. The components shall be referred to by their alpha-numeric designator.

1.14.9.4 Legends and Schedules

The legend shall provide a definition of all symbols used in the control drawings. Schedules shall provide all necessary information to clarify the operation of the components or the overall system.
1.14.9.5 System Checklists and Startup Instructions

The designer shall develop Pre-commissioning Test Checklists, Functional Performance Test Checklists, and Startup Instructions for each system and item of equipment controlled by the temperature control system and shall include them in the temperature controls Specification. Each system and item of equipment shall have its own separate Checklist and Startup Instructions. The Checklists and Startup Instructions shall be tailored to each individual component of the respective system or item of equipment and shall use the terminology and nomenclature used in the contractor's drawings and specification.

1.15 TESTING, ADJUSTING, AND BALANCING (TAB) OF HVAC SYSTEMS

Testing, adjusting, and balancing shall meet the requirements of UFGS Section 23 05 93.00 10 TESTING, ADJUSTING AND BALANCING OF HVAC SYSTEMS. The work required by this Section shall be complete, including all test and inspection reports, before starting the commissioning functional testing.

1.15.1 Balancing Firm Qualifications

TAB shall be performed by an independent firm using certified technicians under the direct supervision of a registered engineer. Technicians shall be certified by the National Environmental Balancing Bureau (NEBB) or the Associated Air Balance Council (AABC). The firm shall select AABC MN-1 or NEBB-01 as the standard for providing TAB of the mechanical systems.

1.16 COMMISSIONING OF HVAC SYSTEMS

This section contains instructions and engineering information relating to the commissioning of HVAC systems, including pre-commissioning checks and functional performance tests. The commissioning of HVAC systems shall meet the requirements of UFGS Section 23 08 00.00 10 COMMISSIONING OF HVAC SYSTEMS.

1.16.1 General

The purpose of commissioning is to bring the project HVAC systems to a state of dynamic operation by verifying the operation of individual components, subsystems, and systems. The commissioning process shall be planned, scheduled, and prepared for, as an integral portion of the project, from design, through construction, to final acceptance. Commissioning shall begin only after all work required in articles entitled "BUILDING TEMPERATURE CONTROL SYSTEM" and "TESTING, ADJUSTING, AND BALANCING (TAB) OF HVAC SYSTEMS" has been successfully completed, and all test and inspection reports and operation and maintenance manuals required in these Sections have been submitted and approved. Commissioning and endurance testing of all systems and equipment shall be a prerequisite to final acceptance of the facility.

1.16.2 Commissioning Firm Qualifications

System Commissioning shall be done by an independent firm experienced in this work.

1.16.3 Checklists

The commissioning test requirements shall be in detail, with all specific steps and procedures clearly formulated for a complete checkout of the
systems. The prewritten pre-commissioning and functional performance tests checklists provided in the contractor's specifications are examples only and shall be completely edited, by adding or deleting items, to provide the necessary commissioning test requirements of the actual equipment installed. If there is no example checklist for an item of equipment in the project, the designer shall formulate a checklist and include it in the contractor's specifications.

1.16.4 Pre-commissioning Checks

Pre-commissioning checks, done in accordance with the prewritten checklists, shall be performed for each item of mechanical equipment. Deficiencies discovered during these checks shall be corrected and retested prior to start of the Functional Performance Tests.

1.16.5 Functional Performance Tests

Functional performance tests, done in accordance with the prewritten checklists, shall be performed for each equipment item. Functional performance tests shall begin only after all pre-commissioning checks have been successfully completed.

1.17 OPERATION AND MAINTENANCE REQUIREMENTS

Facility Operation and Maintenance (O&M) Manuals, including associated Training Course and Training Manuals, shall be provided for the mechanical systems and shall meet the requirements of the individual UFGS Sections.

1.17.1 Facility Operation and Maintenance Manuals

The intent of the O&M Manuals is to promote and maximize the efficiency, economy, safety, and effectiveness of the life cycle operation, maintenance, and repair of the facility. Comprehensive, self-contained manuals shall include all of the identified building's interior systems, plus the exterior portions of systems that support the building. Draft O&M Manuals are required to be delivered a minimum of seven days prior to O&M systems training.

1.17.2 Operation and Maintenance Training Course and Manuals

Training courses shall be conducted for 5 operating staff members designated by the Contracting Officer in the maintenance and operation of all systems. Two-week notice shall be given to the Contracting Officer before the start of training. Training shall consist of one (1) training day. A training day is defined as 8 hours of classroom instruction, including breaks and lunchtime, Monday through Friday, during the daytime shift in effect at the training facility. For guidance in planning the required instruction, the Contractor shall assume that the attendees will have a high school education or equivalent, and are familiar with the systems. No training shall be scheduled until training manuals and O&M manuals have been approved by the Government. A minimum of 5 O&M manuals shall be provided for the instructions and 2 manuals for the facility shall be given to the Contracting Officer to turnover to the Directorate of Public Works. The training course shall cover all of the items contained in the O&M Manuals.

1.17.2.1 Training Course Content

The courses shall be taught at the project site for a period of one (1)
training day(s). The training courses shall cover all the material contained in the Operating and Maintenance Instructions, and O&M manuals the layout and location of each system and shall include the following for each system:

a. Troubleshooting
b. Diagnostics
c. Calibration
d. Adjustment
e. Commissioning
f. Repair procedures

Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system. The results of the performance verification tests and the calibration, adjustment and commissioning reports shall be presented as benchmarks of the system(s) performance by which to measure operation and maintenance effectiveness. Draft or completed O&M Manuals shall be used during training.

1.17.2.2 Video Taping

Video taping, in DVD format, shall be provided for all operation and maintenance training.

1.18 TECHNICAL SPECIFICATIONS

Government provided Unified Facility Guide Specification (UFGS) (available to the Design-Build Contractor as indicated in Section 01 33 00, SUBMITTAL PROCEDURES) shall be completely edited and fully coordinated with the contractor's drawings to accurately and clearly identify the product and installation requirements for the facility. The contractor's specifications shall not be edited to reduce the level of quality for equipment services provided, or materials. The contractor's specifications shall be edited in accordance with the designer notes associated with each specification and with the Specification Requirements (Division 01 General Requirement Specifications). In case of a conflict, the criteria found in the Specification Requirements (Division 01 General Requirement Specifications) shall take precedence. The provided specifications define the minimum requirements for items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals and testing that shall be provided for the facility. Where items of equipment, materials, installation, training, operating and maintenance instructions, O&M manuals or testing requirements are not specified in the provided specifications, special paragraphs within each applicable guide specification shall be prepared to specify those items. Government approval is required for any addition of materials, equipment, or installation requirements not covered in the guide specifications. Specific items of equipment identified in the provided specifications but not required for the facility shall be edited out.

1.18.1 Format

Unless instructed otherwise, specifications shall be in review format with editing adjustments identified (in electronic versions: deletions shall be
flagged by red lettering, additions by green lettering; in printed
versions: deletions shall be identified "striking through", additions by
underlining.

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PART 1   GENERAL

1.1 REFERENCES

The publications are referred to in the text by the basic designation only. The most current edition shall be used whenever a specific edition is not mentioned.

ASTM INTERNATIONAL (ASTM)


INTERNATIONAL CODE COUNCIL (ICC)


NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10 (2013) Standard for Portable Fire Extinguishers

NFPA 13 (2016) Standard for the Installation of Sprinkler Systems


NFPA 10 (2013) Standard for Portable Fire Extinguishers


U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 4-021-01 Design & O&M: Mass Notification Systems, January 2010

UFC 4-021-02 Electronic Security Systems

This project is a Small Arms Range Complex at Buckley AFB, Colorado. Any new egress, suppression system (sprinklers), and alarm and mass notification systems shall meet the requirements stated herein. Fire protection shall be based on sound fire protection engineering principles and shall give safeguards against loss of life and property by fire, consistent with the mission, risk involved, and economical utilization. A Life Safety/Building Code analysis shall be provide by the Fire Protection
Engineer. At final submission, the Fire Protection Engineer shall stamp and seal the Life Safety/Building Code plans. Fire protection criteria shall also be based on the codes listed above and on the following code requirements:

ADA and ABA Accessibility Guidelines for Buildings and Facilities (www.access-board.gov/ada-aba/final.cfm)

Omaha District Design Guide (January 2015)

All requirements of the latest aforementioned codes shall be incorporated into the design. A Fire Protection Engineer shall be part of the design team in accordance with UFC 3-600-01 and shall a single person. The Fire Protection Engineer shall provide a Life Safety Code Analysis and Building Code Analysis of the new facility as well as be responsible for the design of the new fire alarm, fire sprinkler, and mass notification systems. At 100% design submission, the Fire Protection Engineer of Record shall submit a letter to USACE certifying the project meets all of the mentioned codes, and NFPA 101 criteria.

The Life Safety Code

NFPA 101 relative to this design shall give special attention to the application of fire codes as they relate to Life Safety. Features of fire protection based on the following shall be included in the design: Automatic operating devices; Exiting for inhabitants and the protection of egress components; Personnel safety in hazardous areas; Appropriate ratings of fire and smoke partitions, doors and windows; Travel distances; Common paths of travel; Occupancy types; Hazard of occupancies and their contents; and Isolation from the remainder of the facility.

Applicable requirements of the International Building Code shall also be included in the design. These shall include the following: Types of construction; Fire area limitations; Increases to allowable floor areas; and Separation of structures.

All military construction must comply with the code requirements set forth in

FEP, Buckley Air Force Base Facilities Excellence Plan,

UFC 1-200-01,

UFC 3-600-01, UFC 4-021-01, Air Force

ETL 11-18, and Air Force

FC 4-179-03F.  

All fire protection design shall be done by a Fire Protection Engineer in accordance with UFC 3-600-01. Refer to section 28 31 76 INTERIOR FIRE ALARM AND MASS NOTIFICATION SYSTEM for additional information regarding qualification requirements for the fire alarm and mass notification system designer. The fire protection engineer shall perform a Life Safety/Building Code analysis of the renovated facility including egress capacity and pathways. At final submission, the Life Safety/Code Analysis shall be stamped and sealed by the Fire Protection Engineer of Record. The life safety analysis shall be submitted with the first submittal for review. Life safety analysis shall comply with UFC 3-600-01 and NFPA 101.
The new floor plans shall be evaluated for compliance with NFPA 101.

1.2 OCCUPANCY FOR THE PROJECT

The project will be classified in accordance with NFPA 101. According to Chapter 4 of the International Building Code (IBC), the project will be classified as part of the Life Safety Code Analysis. Review assembly, storage, and business occupancies.

1.3 CONSTRUCTION PER 2015 INTERNATIONAL BUILDING CODE (IBC)

Type IIB, except that hourly fire rating requirements for the building systems and components shall not be less than those specified in the performance specifications sections of IBC.

1.4 CORRIDORS

Review NFPA 101 to determine fire rating of corridors and exits.

Separation of incidental use areas shall be provided per NFPA 101.

1.5 INTERIOR FINISHES

Interior wall and ceilings of exits shall be in accordance with NFPA 101. Review based upon occupancy.

Interior floor finishes in exits shall be in accordance with NFPA 101. Review based upon occupancy.

No downgrade in finish Class due to complete coverage by an automatic sprinkler system shall be allowed.

1.6 EGRESS CAPACITY:

Egress capacities shall be in accordance with NFPA 101 and included as part of the scope of work and Life Safety Code Analysis.

1.7 MEASUREMENT OF TRAVEL DISTANCE TO EXITS:

NFPA 101, SEC 7.6 - Review as part of the Life Safety Code Analysis

1.8 FIRE EXTINGUISHER CABINETS:


1.9 AUTOMATIC SPRINKLER SYSTEMS:

Provide a new sprinkler system throughout the entire facility, except in downrange firing area. Refer to Air Force ETL 11-8. The firing platform shall be provided with a fire sprinkler system. Provide a dry sprinkler system for any areas subject to freezing. Provide a new water service into the building with a new Post Indicator Valve. The new PIV shall have a tamper switch tied to the building fire alarm system. Provide a new fire sprinkler service entrance with a vertical double check valve assembly. Provide a forward flow test assembly for the new back flow prevention device. Provide a new fire department connection with check valve. All valves shall be provided with a tamper switch tied to the fire alarm system. System shall be designed per UFC 3-600-01. Also, provide fire sprinkler systems for any overhangs, canopies, or storage areas where
required by NFPA 101 or UFC 3-600-01. Areas and densities shall comply with UFC 3-600-01. Hydraulically calculate the new system per NFPA 13. Obtain a current fire hydrant flow data for the design of the system. A structural engineer shall be part of the contractor's design team. The structural engineer shall review all piping supports for the new structure. The new sprinkler system shall not overload the building's structural capacity. Only UFGS fire suppression specifications shall be edited and used for this project (Section 21 13 13.00 10, and/or 21 13 17.00 10). For underground fire mains, water velocity shall not exceed 10 fps for any plastic pipe. Provide surge pressure analysis for the plastic pipe system.

1.10 PRESENCE OF DISABLED OCCUPANTS

Disabled personnel will potentially be present. Provisions for accessibility and usability will be made for physically handicapped individuals for exiting these facilities. Refer to Paragraph 1.18 for fire alarm system requirements.

1.11 FUNCTIONAL AND TECHNICAL REQUIREMENTS

1.11.1 Building Construction Type

These facilities shall comply with a minimum Construction Type IIBV, in accordance with ICC IBC, Table 601. Review as part of the Life Safety/Building Code Analysis.

1.11.1.1 Exterior Walls

Exterior walls of the facilities will not be rated as long as minimum distances from other buildings are maintained and the area and size of the structure does not require it per IBC. Review as part of the Life Safety/Building Code Analysis.

1.11.1.2 Roof

The building roof covering shall be in accordance with UFC 3-600-01. Review as part of the Life Safety/Building Code Analysis.

1.11.1.3 Interior Walls

All penetrations in fire and smoke rated walls (conduits, pipes, cable trays, etc.) shall be fire or smoke stopped according to their respective wall/floor/ceiling rating at each penetration. Review all building walls as part of the Life Safety/Building Code Analysis and provide smoke and fire rated walls as necessary as part of NFPA 101.

1.11.1.4 Interior Finishes

Interior finish materials on walls, ceilings, partitions, and furnishings of all types in all exits shall be as defined in NFPA 101. All other areas will have interior finish materials for walls, ceilings, and furnishings as required by NFPA 101. Smoke Developed Ratings will not exceed 50 for Class A materials, 100 for Class B materials, and 200 for Class C materials when tested in accordance with ASTM E 84 in accordance with UFC 3-600-01.

Provide self-closing hardware and gasketing at all fire-rated doors as well as smoke rated doors.
1.12 FIRE ALARM AND DETECTION SYSTEMS

Installation of the Fire Alarm and Mass Notification System shall require a Certification and Accreditation to be obtained, refer to section 01 86 29 COMMUNICATIONS REQUIREMENTS for additional information.

1.12.1 Fire Alarm and Mass Notification Panel

This project shall provide a new addressable fire alarm and mass notification system and panel (FACP). All new circuits to the addressable type fire alarm system shall comply with NFPA 72, UFC 3-600-01, and NFPA 101. Contractor shall install new detectors and initiating devices as required. Provide appropriate interfaces at the new panel to allow all new alarm detection, new fire alarm devices and new initiation devices to be connected to the addressable panel. System shall meet the Buckley Air Force Base Requirements and all other applicable standards. Provide a new transmission device to send fire alarm and mass notification signals to the AES receiving equipment located at the base fire department. Refer to AF ETL 11-18.

The system shall be addressable to each reporting device and with turnkey MNS. MNS devices shall be combination speaker/strobe on ceilings or walls. The system shall be complete with the control panel in the building and required devices. The addressable system shall transmit and receive addresses and data between the control panel and the new devices. Comply with UFC 4-021-01 for all aspects of the Mass Notification System.

1.12.2 Initiating and Notification Devices

The new system shall include addressable manual pull stations, addressable heat detectors, addressable duct smoke detectors, addressable spot type smoke detectors, and audible and visual notification appliances that comply with ADA requirements.

1.12.3 Mass Notification System

Refer to Section 28 31 76 and UFC 4-021-01 for requirements for the Mass Notification System. Provide a new Mass Notification System for the building.

1.12.4 Interfaces to Other Systems

The new system shall shut down appropriate air handling equipment, smoke dampers, and release magnetic door holding devices as necessary for proper operation of the facilities. Provide a "Sequence of Operations Matrix" to coordinate with alarm functions in Section 28 31 76 ADDRESSABLE FIRE ALARM AND MASS NOTIFICATION SYSTEMS. The "Sequence of Operations Matrix" shall be approved by the Contracting Officer. System shall meet requirements of UFC 4-021-02, if applicable.

1.12.5 Layout Considerations

Duct smoke detectors shall be provided on all new air handling supply fans over 2000 CFM, and all new return fans over 15,000 CFM. Smoke detectors, shall be provided where electromagnetic door holders are used. Audible and visual notification appliances shall be provide to meet these specifications. This includes the new interior egress doors. Design shall comply with ADA Requirements, NFPA 101 and NFPA 72. Provide an audible notification appliance on the exterior at each exit door. Addressable
initiating device circuits modules shall be provided for each non-addressable device, excluding notification appliances. Visual strobes shall be located in every space within the building.

1.13 FIRE PROTECTION SPECIFICATIONS (SUBMITTALS AND ACCEPTANCE TESTS)

The sprinkler and fire alarm submittals shall be reviewed and approved by the Base Fire Chief or designated representatives as well as USACE Omaha District Fire Protection Engineer. Only UFGS fire alarm and fire suppression specifications shall be edited and used for this project. All submittals shall be stamped and sealed by a Registered Fire Protection Engineer.

Representatives of the Base Fire Department shall inspect and witness all final acceptance testing prior to the Contracting Officer accepting the sprinkler and fire alarm systems.

Fire water service shall be installed and tested in accordance with NFPA 24 guidelines. Fire sprinkler system shall be tested in accordance with NFPA 13 guidelines. Fire alarm and mass notification shall be tested in accordance with NFPA 72 guidelines.

1.14 DESIGN OBJECTIVES AND PROVISIONS

1.14.1 Zoning and Treatment of Each Potential Hazard

1.14.1.1 Limiting Fire Spread

Every horizontal opening and hazardous locations as defined by NFPA 101.

1.14.2 Provision and Maintenance of an Unobstructed Emergency Egress System

All corridor widths, clear space requirements relative to exit doors, etc., shall be in accordance with the Uniform Federal Accessibility Standards and the Americans with Disabilities Act for unobstructed egress. Emergency lighting shall be installed in accordance with NFPA 101.

1.14.3 Maximum dead ends.

Maximum dead ends shall be as per NFPA 101. Verify as part of the Life Safety/Building Code Analysis.

1.14.4 Egress locations

Egress locations shall be marked with exit signs per NFPA 101. Review as part of the Life Safety/Building Code Analysis.

1.14.5 Outside Exit Doors

Outside exit doors shall swing in the direction of exit travel. Outside exit doors shall be equipped with panic hardware mounted 44 inches above the finish floor and have a minimum clear width of 34 inches to allow for egress. Exit doors requiring security hardware shall be reviewed as part of the Life Safety/Code Analysis. Review per NFPA 101.

1.14.6 Required Fire Exits

Required fire exits from the building shall lead to a public way or to a
clear safe area at a minimum distance of 75-feet from the building.

-- End of Section --
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PART 1 GENERAL

1.1 REFERENCES

Publications, codes, specifications and standards shall be used as the basis for the project design and shall include, but not be limited to the following. Publications and codes that imply recommendations shall be taken to be mandatory. Where there are conflicting criteria, the requirements of this RFP take precedence.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)


ASTM INTERNATIONAL (ASTM)


AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)


AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 318M (2014; ERTA 2015) Building Code Requirements for Structural Concrete & Commentary


INTERNATIONAL CODE COUNCIL (ICC)


ILLUMINATING ENGINEERING SOCIETY (IES)

IES HB-10 (2011; Errata 2015) IES Lighting Handbook

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<td>NEMA ICS 2</td>
<td>(2000; R 2005; Errata 2008) Standard for Controllers, Contactors, and Overload Relays Rated 600 V</td>
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<td>NEMA SSL 3</td>
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<tr>
<td>NEMA ST 20</td>
<td>(1992; R 1997) Standard for Dry-Type Transformers for General Applications</td>
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<tr>
<td>NEMA TC 7</td>
<td>(2013) Standard for Smooth-Wall Coilable Electrical Polyethylene Conduit</td>
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<td>NEMA WD 1</td>
<td>(1999; R 2005; R 2010) Standard for General Color Requirements for Wiring Devices</td>
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<td>NEMA Z535.1</td>
<td>(2006; R 2011) Safety Colors</td>
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TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

TIA-607 (2011b) Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 4-010-01 (2012; with Change 1) DoD Minimum Antiterrorism Standards for Buildings


UFC 3-520-01 (2015) Interior Electrical Systems

UFC 3-530-01 (201) Design: Interior and Exterior Lighting and Controls

UFC 3-550-01 (2016) Design: Exterior Electrical Power Distribution, including Change 1

UFC 3-560-01 (2006, with Change 5) Electrical Safety, O&M

UFC 3-575-01 (2012) Lightning and Static Electricity Protection Systems

UFC 3-580-01 (2016) Telecommunications Interior Infrastructure Planning and Design, with Change 1

UFC 3-600-01 (2016; with Change 1) Fire Protection Engineering for Facilities

UFC 4-021-01 (2008; with Change 1) Design and O&M: Mass Notification Systems

FC 4-179-03F (2015) Air Force Small Arms Firing Range

UNDERWRITERS LABORATORIES (UL)

UL 1 (2005; Reprint Jul 2012) Standard for Flexible Metal Conduit

UL 1449 (2014; Reprint Mar 2015) Surge Protective Devices


UL 1569 (2014; Reprint Dec 2015) Standard for Metal-Clad Cables

UL 1581 (2001; Reprint Jun 2015) Electrical Wires, Cables, and Flexible Cords

UL 1598 (2008; Reprint Oct 2012) Luminaires

UL 1660 (2014) Liquid-Tight Flexible Nonmetallic
Conduit

UL 1699  
(2006; Reprint Nov 2013) Arc-Fault Circuit-Interrupters

UL 20  
(2010; Reprint Feb 2012) General-Use Snap Switches

UL 231  
(2008; Reprint Sep 2014) Power Outlets

UL 248-1  
(2011) Low Voltage Fuses - Part 1: General Requirements

UL 2556  
(2015) UL Standard for Safety Wire and Cable Test Methods

UL 360  
(2013; Reprint Jan 2015) Liquid-Tight Flexible Steel Conduit

UL 44  
(2014; Reprint Feb 2015) Thermoset-Insulated Wires and Cables

UL 444  
(2008; Reprint Apr 2015) Communications Cables

UL 467  
(2007) Grounding and Bonding Equipment

UL 486A-486B  
(2013; Reprint Jan 2016) Wire Connectors

UL 486C  
(2013; Reprint Jan 2016) Splicing Wire Connectors

UL 489  
(2013; Reprint Mar 2014) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures

UL 498  
(2012; Reprint Jan 2016) Attachment Plugs and Receptacles

UL 5  
(2011) Surface Metal Raceways and Fittings

UL 514A  
(2013) Metallic Outlet Boxes

UL 514B  
(2012; Reprint Nov 2014) Conduit, Tubing and Cable Fittings

UL 514C  
(2014; Reprint Dec 2014) Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

UL 5A  
(2015) Nonmetallic Surface Raceways and Fittings

UL 6  
(2007; Reprint Nov 2014) Electrical Rigid Metal Conduit-Steel

UL 651  
(2011; Reprint May 2014) Standard for Schedule 40 and 80 Rigid PVC Conduit and Fittings
1.2 SCOPE OF WORK

1.2.1 Small Arms Range Complex

This project will include all design, calculations, etc. for all premises systems required for a Small Arms Range Complex. All associated references are required to be included in this design and construction of the new building. Design shall follow all applicable Unified Facilities Criteria, including the following:

UFC 3-501-01, UFC 3-520-01, UFC 3-530-01, UFC 3-550-01,
UFC 3-560-01, UFC 3-575-01, UFC 3-580-01, UFC 3-600-01,
UFC 4-021-01, & FC 4-179-03F.

A survey of existing conditions, including location of underground utilities shall be provided, and incorporated prior to submitting the 100% design.

If the UFGS products or systems are applicable to the project, the DOR shall edit these referenced UFGS sections and submit them as a part of the design submittal specification.
1.2.2  Small Arms Site Area

This portion of work includes installation and modifications of new underground electrical distribution systems. All work shall meet 1.2.1 requirements. The installation shall also meet BAFB FEP IDG.

Site work includes, but is not limited to the following list.

1. Three, 15kV aluminum conductors with 1/3 concentric neutral and 133% EPR insulation installed in a concrete underground ductbank with 6" PVC conduit. Properly sized manhole, a minimum of 2 pullboxes, with a 6" spare conduit installed in ductbank per BAFB FEP IDG.

2. 600V conductors meeting UFC 3-550-01.


4. Padmount transformer, with associated secondary service.

5. All lightning & grounding systems required, meeting IEEE 81, NFPA 70, NFPA 77, NFPA 780 & IEEE 1100.

1.2.3  Small Arms Building

This portion of the work includes all premises wiring systems. This includes all power, lighting, control, and signal wiring with their associated hardware, fittings, and wiring devices. All systems shall meet section 1.2.1 requirements. The basis of design is FC 4-179-03F along with the associated standard drawings. The tenants have additional requirements above the standard as indicated in the following section.

1.2.3.1  General

1. Rough-In for tenant provided CATV, (Satellite) system. This includes conduit stub-ups above ceiling spaces where applicable, associated hardware, raceways routed to the new communications room, faceplates and pull strings.

2. Rough-In for Audio Video system speakers in classroom. Coordinate final numbers with tenant, with a minimum of two locations inside classroom. This includes conduit stub-ups above ceiling spaces where applicable, raceways associated hardware, pull strings.

3. Lighted Beacon tied into exhaust system for the shooting range. This shall indicate when range is active. Color, style, and location shall be coordinated with tenant. This systems requires all controls, signal and power wiring, raceways, associated hardware, etc.

4. Four pairs of beacon lights mounted at the back of the shooting range. Each pair will consist of a red and blue flashing beacon. All power to the beacons shall be controlled at the control booth pilot light switch.

5. Rough-In for a future Intrusion Detection System, provided by others, located at all outer doors. The rough-in shall include all stub-ups, raceways with pull strings routed to the new communications room, and blank faceplates.
1.2.3.2 Room Data Sheets

1. Administrative Instructor Room
   a. As detailed in the facility criteria document.

2. Break Room
   a. Provide power for two (2) microwaves, instead of the one listed. Each shall be on its own dedicated circuit.

3. NCOIC Office
   a. As detailed in the facility criteria document.

4. Open Office
   a. As detailed in the facility criteria document.

5. Queuing Room
   a. WIFI shall be rough-in only.

6. Arms Range
   a. As detailed in the facility criteria document.

7. Control Booth Room
   a. Mount power strip for controls at 4' minimum.
   b. For target retrieval, provide rough-ins, including pull strings, junction boxes, raceways, and associated hardware for automated target retrieval.
      1. Provide override, (Automated Target Retrieval), control rough-ins at each shooting position.

8. Range Supplies
   a. As detailed in the facility criteria document.

9. Classroom
   a. As detailed in section 1.2.3.1.
      b. Power and HDMI, Component, CAT 6 systems for a ceiling mounted projector. All audio visual cables shall be routed to a tenant specified location.

10. Observation Room
    a. As detailed in the facility criteria document.

11. Classroom/Simulator Room Storage
    a. As detailed in the facility criteria document.

12. Weapons Simulator Office
    a. As detailed in the facility criteria document.

13. Weapons Maintenance Shop
    a. As detailed in the facility criteria document, except verify location of part cleaner, and provide power strips mounted above workbenches meeting NFPA 70.

14. Student Weapons Cleaning Room
    a. As detailed in the facility criteria document.

15. Arms Vault and Issue Room
    a. As detailed in the facility criteria document.

16. Janitors Closet, Restroom/Locker, Laundry Rooms
a. As detailed in the facility criteria document.

17. Building Support Rooms
   a. As detailed in the facility criteria document.

18. Building Lightning Protection System

1.3 Submittals

   Cable Installation Plan and Procedure; G, DA

   Six copies of the information described below in 8-1/2 by 11 inch binders having a minimum of three rings from which material may readily be removed and replaced, including a separate section for each cable pull. Separate sections by heavy plastic dividers with tabs, with all data sheets signed and dated by the person supervising the pull.

   a. Site layout drawing with cable pulls numerically identified.

   b. A list of equipment used, with calibration certifications. The manufacturer and quantity of lubricant used on pull.

   c. The cable manufacturer and type of cable.

   d. The dates of cable pulls, time of day, and ambient temperature.

   e. The length of cable pull and calculated cable pulling tensions.

   f. The actual cable pulling tensions encountered during pull.

1.4 Precast Underground Structures

   Submittal required for each type used. Provide calculations and drawings for precast manholes and handholes bearing the seal of a registered professional engineer including:

   a. Material description (i.e., f'c and Fy)

   b. Manufacturer's printed assembly and installation instructions

   c. Design calculations

   d. Reinforcing shop drawings in accordance with ACI SP-66

   e. Plans and elevations showing opening and pulling-in iron locations and details

1.5 Certificate of Competency for Cable Installer, and Splicer/Terminator

   The cable splicer/terminator must have a certification from the National Cable Splicing Certification Board (NCSCB) in the field of splicing and terminating shielded medium voltage (5 kV to 35 kV) power cable using pre-manufactured kits (pre-molded, heat-shrink, cold shrink). Submit "Proof of Certification" for approval, for the individuals that will be performing cable splicer and termination work, 30 days before splices or
terminations are to be made.

Provide at least one onsite person in a supervisory position with a documentable level of competency and experience to supervise all cable pulling operations. Provide a resume showing the cable installers' experience in the last three years, including a list of references complete with points of contact, addresses and telephone numbers. Cable installer must demonstrate experience with a minimum of three medium voltage cable installations. The Contracting Officer reserves the right to require additional proof of competency or to reject the individual and call for an alternate qualified cable installer.

1.6 Directional Boring As-Builts

Provide final installation site conditions for each directional bore, including: HDPE conduit size and type, bend radius, elevation changes, vertical and horizontal path deviations, conductor size and type and any conductor derating due to depth of conduit. Record location and depth of all directional-bore installed HDPE conduits using Global Positioning System (GPS) recording means with "resource grade" accuracy.

PART 2 PRODUCTS & INSTALLATION

2.1 Standard Products

Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with contract requirements will be accepted. Products shall meet NEMA FB 1, ANSI/NEMA OS 1, ANSI/NEMA OS 2, NEMA TC 2, UL 514B, NEMA AB 1, NEMA AB 3, NEMA ANSLG C78.377, NEMA C82.77, NEMA ICS 2, NEMA ICS 6, NEMA LA 1, NEMA MG 11, NEMA MG 2, NEMA PB 1, NEMA RN 1, NEMA SSL 1, NEMA SSL 3, NEMA ST 20, NEMA TC 3, NEMA TC 6 & 8, NEMA TP 1, NEMA TR 1, NEMA WC 7, NEMA WC 8, NEMA WD 1, NEMA WD 6, NEMA WD 7, NEMA Z535.1, NEMA Z535.4, UL 1, UL 1598, UL 1699, UL 231, UL 248-1, UL 467, UL 489, UL 498, UL 514A, UL 514C, UL 5A, & UL 1449.

2.2 Special Environmental Conditions

Exterior electrical equipment such as motors, and lights shall be suitable for the environment and shall operate within a temperature range of -20 degree F to 100 degrees F.

2.3 Color of Exterior Equipment

Exterior electrical equipment such as the service entrance transformer and pad-mounted switches shall be factory painted color meeting BAFB FEP IDG. Exterior equipment shall have a paint coating rated for 120 hours of salt spray exposure. Light poles shall be dark bronze anodized finish.

2.4 Accommodation of Disabilities

Designs shall incorporate provisions of ADA Accessibility Guidelines for
Buildings and Facilities (ADAAG), and the Uniform Federal Accessibility Standards. All aspects concerning placement and sizing from these standards shall be incorporated. In case of a conflict between the 36 CFR 1191 and the UFAS, 36 CFR 1191 shall govern. Provisions pertaining to clearances shall generally be accommodated by other disciplines, however the design shall observe some precautions such as avoiding equipment configurations which would project into restricted clear space in corridors.

2.5 Antiterrorism/Force Protection

2.5.1 Unobstructed Space

The design shall comply with UFC 4-010-01. Ensure that obstructions within 33-feet of inhabited buildings or portions thereof do not allow for concealment from observation of objects 6-inches or greater in height.

2.5.2 Electrical and Mechanical Equipment

The preferred location of electrical and mechanical equipment such as transformers, air-cooled condensers, and packaged chillers is outside the unobstructed space or inside the building.

2.5.3 Utility Distribution and Installation

Route critical utilities and those necessary for life-safety so that they are not on exterior walls or on walls shared with mailrooms.

2.6 Coordination of Electrical Criteria

Electrical criteria provided in this section shall be coordinated with the architectural section, mechanical section, fire protection section, structural section, interior design section, civil and site section, force protection and security section, and all other sections of this RFP. The number and location of electrical equipment indicated in the electrical requirements are approximate. Contractor design shall meet the intent of the electrical requirements provided in this section. Contractor shall coordinate the final locations of electrical equipment with the Contracting Officer. Coordinate with the Contracting Officer for the Government furnished/Government installed (GF/GI): (1) System Furniture; (2) Security Systems and (3) Telephone/Data systems.

2.7 Exterior Primary Electrical Distribution System

The source of power feeding the new Small Arms Facilities New Transformer with incoming power shall be stepped down from 13,200/7620 volts to 480/277 volts at the building service entrance. Large HVAC equipment will be powered using 3-phase, 480 volts. Lighting will be powered using 277 volts. Inside the building, power shall be stepped down from 480/277 volts to 120/208 volts for branch power. The primary feed shall originate from switchgear that is located to the southwest of the proposed site. Provide standard 8’ x 8’ x 8’ octagonal concrete Amcor vault or equal for tying into the site electrical distribution system.

Follow the design requirements in UFC 3-550-01.
2.8 Products & Installation

2.8.1 Medium Voltage Cables and Conduit

The primary electrical distribution system conductors shall be aluminum with the 3-phase conductors meeting sizes as indicated on drawings.

Provide . Provide cables manufactured for use in duct applications as indicated. Cable must be rated 15 kV with 133 percent insulation level.

These cables shall be installed within a conduit encased in concrete, with an approved pulling lubricate. Provide ethylene-propylene-rubber (EPR) insulation conforming to the requirements of ANSI/NEMA WC 71/ICEA S-96-659 and ICEA S-94-649.

Cables rated for 2 kV and above must have a semiconducting conductor shield, a semiconducting insulation shield, and an overall copper tape shield for each phase.

The required conduit arrangement shall be neatly stacked in the trench utilizing plastic duct/conduit spacers and a spacer made out of sheet metal, which shall be driven into the ground prior to concrete encasement. Minimum depth of the conduit shall be 3 feet below the earth's surface. Minimum conduit size shall be 4-inches diameter.

2.8.2 Cable Marking

Identify each cable by means of a fiber, laminated plastic, or non-ferrous metal tags, or approved equal, in each manhole, handhole, junction box, and each terminal. Each tag must contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.

Conductors must be color coded. Provide conductor identification within each enclosure where a tap, splice, or termination is made. Conductor identification must be by color-coded insulated conductors, plastic-coated self-sticking printed markers, colored nylon cable ties and plates, heat shrink type sleeves, or colored electrical tape. Control circuit terminations must be properly identified. Color must be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutrals must be white with a different colored (not green) stripe for each. Color of ungrounded conductors in different voltage systems must be as follows:

a. 208/120 volt, three-phase
   (1) Phase A - black
   (2) Phase B - red
   (3) Phase C - blue

b. 120/240 volt, single phase: Black and red
2.8.3 Products

2.8.3.1 Conduits

Smoothwall, approved/listed for directional boring, minimum Schedule 80, ASTM F2160, NEMA TC 7.

2.8.3.1.1 Duct Encased in Concrete

Construct underground duct lines of individual conduits encased in concrete. Depths to top of the concrete envelope must be not less than 24 inches below finished grade. Do not mix different kinds of conduit in any one duct bank. Concrete encasement surrounding the bank must be rectangular in cross-section and must provide at least 3 inches of concrete cover for ducts. Separate conduits by a minimum concrete thickness of 3 inches. Before pouring concrete, anchor duct bank assemblies to prevent the assemblies from floating during concrete pouring. Anchoring must be done by driving reinforcing rods adjacent to duct spacer assemblies and attaching the rods to the spacer assembly. Provide color, type and depth of warning tape as specified in BAFB FEP IDG.

2.8.3.1.1.1 Connections to Manholes

Duct bank envelopes connecting to underground structures must be flared to have enlarged cross-section at the manhole entrance to provide additional shear strength. Dimensions of the flared cross-section must be larger than the corresponding manhole opening dimensions by no less than 12 inches in each direction. Perimeter of the duct bank opening in the underground structure must be flared toward the inside or keyed to provide a positive interlock between the duct bank and the wall of the structure. Use vibrators when this portion of the encasement is poured to assure a seal between the envelope and the wall of the structure.

2.8.3.1.1.2 Connections to Existing Underground Structures

For duct bank connections to existing structures, break the structure wall out to the dimensions required and preserve steel in the structure wall. Cut steel and bend out to tie into the reinforcing of the duct bank envelope. Chip the perimeter surface of the duct bank opening to form a key or flared surface, providing a positive connection with the duct bank envelope.

2.8.3.1.1.3 Connections to Existing Concrete Pads

For duct bank connections to concrete pads, break an opening in the pad out to the dimensions required and preserve steel in pad. Cut the steel and bend out to tie into the reinforcing of the duct bank envelope. Chip out the opening in the pad to form a key for the duct bank envelope.

2.8.3.1.1.4 Connections to Existing Ducts

Where connections to existing duct banks are indicated, excavate the banks to the maximum depth necessary. Cut off the banks and remove loose concrete from the conduits before new concrete-encased ducts are installed. Provide a reinforced concrete collar, poured monolithically with the new duct bank, to take the shear at the joint of the duct banks.
2.8.3.1.1.5 Partially Completed Duct Banks

During construction wherever a construction joint is necessary in a duct bank, prevent debris such as mud, and, and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct bank with reinforcing steel extending a minimum of 2 feet back into the envelope and a minimum of 2 feet beyond the end of the envelope. Provide one No. 4 bar in each corner, 3 inches from the edge of the envelope. Secure corner bars with two No. 3 ties, spaced approximately one foot apart. Restrain reinforcing assembly from moving during concrete pouring.

2.8.3.1.1 Fittings

2.8.3.1.2 Metal Fittings

UL 514B.

2.8.3.1.3 PVC Conduit Fittings

UL 514B, UL 651.

2.8.3.1.3 PVC Duct Fittings

NEMA TC 9.

2.4.3 Conduits

Smoothwall, approved/listed for directional boring, minimum Schedule 40, ASTM F2160, NEMA TC 7.

2.8.4 Innerduct

Provide corrugated or solid wall polyethylene (PE) or PVC innerducts, or fabric-mesh innerducts, with pullwire. Size as indicated.

2.8.5 Duct Sealant

UL 94, Class HBF. Provide high-expansion urethane foam duct sealant that expands and hardens to form a closed, chemically and water resistant, rigid structure. Sealant must be compatible with common cable and wire jackets and capable of adhering to metals, plastics and concrete. Sealant must be capable of curing in temperature ranges of 35 degrees F to 95 degrees F. Cured sealant must withstand temperature ranges of -20 degrees F to 200 degrees F without loss of function.

2.8.5 Fittings

2.8.6 Metal Fittings

UL 514B.

2.8.7 PVC Conduit Fittings

UL 514B, UL 651.

2.8.8 PVC Duct Fittings

NEMA TC 9.
2.8.9 CAST-IN-PLACE CONCRETE

Provide concrete for encasement of underground ducts with 3000 psi minimum 28-day compressive strength. Concrete associated with electrical work for other than encasement of underground ducts must be 4000 psi minimum 28-day compressive strength unless specified otherwise.

2.8.10 Terminations and Splices

Termination kits shall be type 3M. No splices shall be allowed in the manholes; instead an above-ground medium voltage pad-mounted sectionalizer switch shall be located at the required manhole location with a termination strip and loadbreak elbows in the manhole, fully insulated. The mounting hardware shall be grounded to the ground conductor. Each load break elbow shall have its own drain conductor grounded to the ground conductor.

2.8 Separable Insulated Connector Type

IEEE 386. Provide connector with steel reinforced hook-stick eye, grounding eye, test point, and arc-quenching contact material. Provide connectors of the loadbreak or deadbreak type as indicated, of suitable construction for the application and the type of cable connected, and that include cable shield adaptors. Provide external clamping points and test points. Separable connectors must not be used in manholes/handholes.

a. 200 Ampere loadbreak connector ratings: Voltage: 15 kV, 95 kV BIL. Short time rating: 10,000 rms symmetrical amperes.

2.8.11 Above Ground Medium Voltage Pad Mounted Sectionalizer Switch

The medium voltage pad mounted switches for this project shall be manufactured by S & C Corporation and shall be type as required for a complete distribution system. The ground ring for the pad-mounted switches shall be connected to the new ground guard wire over the power duct bank.

Exterior equipment shall be mounted such that the distance between equipment items is no less than 10-feet and such that the personal egress space around the equipment is no less than 40 inches.

2.8.12 Relay Coordination Study, Short Circuit Analysis, and Arc-Flash Study

Provide a Relay Coordination Study and a Short Circuit Analysis with recommended changes to the relays in the Protective Circuit Breakers. Provide an Arc-Flash Study with recommendations for Personnel Protective Equipment (PPE) at the equipment. Provide warning/danger labels and signs at the equipment. Refer to NFPA 70E. Provide the design services of a registered professional engineer to perform arc-flash study, short circuit analysis and relay coordination study.

2.9 Pad-Mounted Tamperproof Compartmental Transformer

The pad-mounted transformer shall have copper windings and conductors, have mineral oil insulation of low flammability type or "non-flammable", "less flammable liquid-filled" with no PCB contaminates. The transformer shall be loop feed type with load-break switching and surge arresters on spare bushings. Transformer pad shall extend 10-inches beyond the edge of the transformer furnished. Transformer pad shall use conduit window areas instead of pouring around the conduit. Provide at least one spare 4-inch
primary conduit to the transformer. Pad-mounted transformer shall comply with IEEE C57.12.25.

2.9.1 Locations

Transformers should be located not less than 33-feet from combustible walls or building openings. Where this is not feasible, the requirements of UFC 3-600-01 shall be met.

2.9.2 Clearances

Exterior equipment shall be mounted such that the distance between equipment items is no less than 10-feet and such that the personal egress space around the equipment is no less than 42 inches.

2.9.3 Grounding

a. Frame of the transformer is to be grounded from the high voltage equipment pad and the low voltage equipment pad.

b. On the grounded-wye secondary, a ground strap is required from XO to the frame.

c. When a building has a lightning protection system with a ground ring and the transformer has a ground ring and the ground rings are within 25-feet of each other, then the ground rings shall be interconnected below grade.

d. Service from transformer to building shall not have a grounding conductor. Service from Transformer to building shall have a full-size neutral conductor no smaller than the phase conductors.

f. Provide a ground ring (counterpoise); minimum size shall be #4/0 AWG, around pad with a ground rod at each corner. The ground ring size shall be increased in size to the proper size per IEEE C2, if the fault current indicates that #4/0 AWG is not adequate.

g. Extend separate conductors from arresters and transformer neutral/housing and connect to the ground ring.

h. Ground any metallic conduit/duct to the ground ring.

i. Provide any other connections required by the NEC or NESC.

2.9.4 Over-Current Protection

Provide type Bay-O-Net dual-element fuse mounted in series with an ELSP current-limiting fuse.

2.9.5 Design for Precast Structures

ACI 318M. In the absence of detailed on-site soil information, design for the following soil parameters/site conditions:

a. Angle of Internal Friction (phi) = 30 degrees

b. Unit Weight of Soil (Dry) = 110 pcf, (Saturated) = 130 pcf

c. Coefficient of Lateral Earth Pressure (Ka) = 0.33
d. Ground Water Level = 2.5 feet below ground elevation

e. Vertical design loads must include full dead, superimposed dead, and live loads including a 30 percent magnification factor for impact. Live loads must consider all types and magnitudes of vehicular (automotive, industrial, or aircraft) traffic to be encountered. The minimum design vertical load must be for H20 highway loading per AASHTO HB-17.

f. Horizontal design loads must include full geostatic and hydrostatic pressures for the soil parameters, water table, and depth of installation to be encountered. Also, horizontal loads imposed by adjacent structure foundations, and horizontal load components of vertical design loads, including impact, must be considered, along with a pulling-in iron design load of 6000 pounds.

g. Each structural component must be designed for the load combination and positioning resulting in the maximum shear and moment for that particular component.

h. Design must also consider the live loads induced in the handling, installation, and backfilling of the manholes. Provide lifting devices to ensure structural integrity during handling and installation.

2.9.6 Specific Site Construction Requirements

1. 4' X 7' 200 amp vault. Over-Excavate as necessary to install with 18" base of Rock, 2" of tamped gravel, and a 6" bed of tamped sand free of rock and gravel.

   a. Compacted in 8" layers to 95 percent of the maximum density obtained by AASHTO Std. T180 or ASTM D-1556 & ASTM D-1557.

   b. If firm material has not been reached within a depth of 3 feet, excavate 3 feet beyond the perimeter of the enclosure and backfill the entire excavated area to the required grade

      1. In case it has been necessary to excavate deeper than the required grade to reach firm material, backfill to the required grade in following way:

         a) Precast vaults shall be placed on a 3-inch layer of slurry backfill or sand screeded level to provide uniform bearing. The soil-cement slurry consisting of one sack of Portland cement per cubic yard and clean native soil or sand.

2.9.7 Directional Boring

HDPE conduits must be installed below the frostline and as specified herein.

For distribution voltages greater than 1000 volts and less than 34,500 volts, depths to the top of the conduit must not be less than 48 inches in pavement-covered areas and not less than 120 inches in non-pavement-covered areas. For branch circuit wiring less than 600 volts, depths to the top of the conduit must not be less than 24 inches in pavement- or non-pavement-covered areas.
2.10 CABLE PLAN & PROCEDURES

2.10.1 Cable Installation Plan And Procedure

Obtain from the manufacturer an installation manual or set of instructions which addresses such aspects as cable construction, insulation type, cable diameter, bending radius, cable temperature limits for installation, lubricants, coefficient of friction, conduit cleaning, storage procedures, moisture seals, testing for and purging moisture, maximum allowable pulling tension, and maximum allowable sidewall bearing pressure. Perform pulling calculations and prepare a pulling plan and submit along with the manufacturer's instructions in accordance with SUBMITTALS. Install cable strictly in accordance with the cable manufacturer's recommendations and the approved installation plan.

Calculations and pulling plan must include:

a. Site layout drawing with cable pulls identified in numeric order of expected pulling sequence and direction of cable pull.

b. List of cable installation equipment.

c. Lubricant manufacturer's application instructions.

d. Procedure for resealing cable ends to prevent moisture from entering cable.

e. Cable pulling tension calculations of all cable pulls.

f. Cable percentage conduit fill.

g. Cable sidewall bearing pressure.

h. Cable minimum bend radius and minimum diameter of pulling wheels used.

i. Cable jam ratio.

j. Maximum allowable pulling tension on each different type and size of conductor.

k. Maximum allowable pulling tension on pulling device.

2.11 Underground Service Entrance/Feeder/Branch Circuits

The new underground service entrance shall be fed from the new transformer provided by the contractor.

2.12 Conductors

Service entrance conductors, branch and feeder circuits shall be single conductors, type USE or RHW. Service entrance conductors and underground feeder/branch circuits shall be copper conductors with insulating grounding conductor in conduit. Aluminum conductors and direct buried cables are NOT acceptable.

2.13 Conduits

Non-concrete encased conduits shall be schedule 80 PVC or HDPE until they are located under slab where they can transition to schedule 40 PVC or
HDPE. Conduits shall be non-encased, direct buried for low voltage circuits. Top of conduit shall be a minimum 24-inches below finished grade. Conduits and innerduct shall have pull strings. Transition to RGS conduit when above grade.

2.14 Exterior Lighting System

Area lighting shall be provided for walkways, above exit doors, above overhead doors, and for area signage. Lighting shall also be provided under new exterior canopies. Lighting fixtures shall be LED full-cutoff type. Fixture finish shall be anodized bronze. Walkway lighting shall be accomplished using LED shoebox fixtures mounted on 12-foot poles. The use of LED bollards is also acceptable for walkway lighting, but shall only be installed near building entryways. Design shall be in accordance with IES HB-10 IES LIGHTING HANDBOOK, ASHRAE 90.1 - IP, UFC 3-530-01 and the requirements in this section. Where there is a conflict between IES HB-10 IES LIGHTING HANDBOOK and UFC 3-530-01, IES HB-10 shall take precedence.

A conceptual area lighting layout shall be the responsibility of the designer. However the final layout of the exterior lighting system shall meet BAFB FEP IDG & all other applicable criteria documents.

Care should be taken during the exterior lighting design to minimize the amount of light trespass. This may be accomplished through a variety of methods including but not limited to full cut off fixtures, light fixture shields, and fixture aiming. The exterior lighting system design shall result in a maximum illuminance value no greater than 0.10 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 10-feet beyond the site boundary. Site lighting fixtures shall be selected so that no more than 2% of the total lumen output for the site are emitted at an angle of 90-degrees of higher from nadir.

2.15 Exterior Building Lighting

Exterior building lighting fixtures shall be recessed and wall pack type fixtures installed around the building and over doors. Fixtures shall be LED and sized to meet the lighting criteria. Fixtures shall be mounted near each entrance for the building. Exterior building lighting control shall be as referenced in paragraph "Exterior Lighting Control" below. Fixtures shall be wired from within the building and shall conform to the interior wiring standards described in this section. No building lighting circuits shall be surface mounted.

2.15.1 LED Lighting Fixtures

Light emitting diode (LED) fixtures shall be capable of multi-level control with a CCT of 3985 K +/-275K and a CRI of no less than 70. LED fixtures with screw base light sources are not permitted. Built in fixture failure detection shall be provided. Exterior LED luminaires require integral metal oxide varistors (MOV) type surge protection device (SPD).

LED drivers shall have a total current harmonic distortion no greater than 20 percent, power factor greater than or equal to 90 percent.

2.15.2 Exterior Lighting Controls

Provide programmable lighting control relay panel with photocell input. Building mounted lights shall be individually controlled as per lighting
type. Exterior fixtures shall make use of motion sensors to automatically reduce power by a minimum of 30% during any period when no activity has been detected for a time of no longer than 15 minutes.

2.15.3 Underground Lighting Circuits

Provide underground branch circuits for exterior lighting circuits. Branch circuits shall be insulated copper conductors with insulated grounding conductor in conduit. Aluminum conductors are NOT acceptable. Direct buried conductors are NOT acceptable. Underground lighting conductors shall be in schedule 80 PVC with steel RMC elbows. Transition to steel RMC conduit when above grade. Top of conduit shall be 24-inches below finished grade.

2.16 Cathodic Protection System

A sacrificial anode cathodic protection system shall be provided for underground metallic lines, fittings, valves and fire hydrants. If underground lines are non-metallic, then associated metallic fittings, valves, hydrants, Tee's and 90's, etc. shall be protected and there shall be a tracer wire provided over the pipeline. A dedicated galvanic anode shall be used for each fitting, valve, hydrant, etc. Galvanic anodes shall be connected to the structure through a test station. At least one test station shall be provided on each valve, fire hydrant and metallic pipe. Isolate new piping from existing piping. Insulated flanges or couplings, if not accessible, shall have a test station which is connected to either side of the insulated flange or coupling. Connections to structures shall be done with two conductors: one is the active conductor and one is a spare. A conductor color coding system shall be used: black for anode, red for main structure and blue for a second structure. In addition to the anodes, metallic pipes must be provided with a coating system. The cathodic protection systems shall be designed and installed in accordance with AFI 32-1054 and NACE SP0169 Standards. The design of the system shall be a minimum of 25 years with a soil resistivity of 1500 ohm-cm. The highest quality magnesium anode shall be used. Criteria for determining the adequacy of protection shall be in accordance with NACE SP0169 and shall be selected by the corrosion engineer as applicable. Test stations shall be flush-curb box mounted in 1-foot X 1-foot concrete pads. Anode wires shall be #10 AWG.

Design shall be by a corrosion protection engineer.

2.17 Underground Cable Markings

A color-coded plastic warning tape at least 4-inches wide shall be placed 12-inches above buried utility lines. RED shall be supplied for the buried electrical lines and ORANGE shall be supplied for the buried communication lines.

2.18 Interior Distribution

Follow the design requirements of UFC 3-520-01.

The interior distribution voltage within the building shall be 480/277 volt, 3-phase, 4-wire. Power shall be stepped down from 480/277 volts to 120/208 volts for branch power. Transformers that serve non-linear loads such as the computer receptacles shall be K-rated. Transformers shall be selected using 2016 DOE efficiency standards. Provide transformers per Air
2.19 Service Equipment

Service equipment/disconnecting means shall be provided in the service rated Main Distribution Panelboard (MDP) located in the Electric Room. Transient Voltage Surge Suppression (TVSS) suitable for service distribution equipment shall be provided at the MDP.

2.19.1 Main Distribution Panelboard (MDP)

Provide panelboards in accordance with the following:

a. UL 67 and UL 50 having a short-circuit current rating of 10,000 amperes symmetrical minimum.

b. Panelboards for use as service disconnecting means: additionally conform to UL 869A.


Lighting and appliance branch-circuit panelboards shall be of the circuit breaker type conforming to NEMA PB 1 and UL 489 and shall be located within the electrical rooms.

a. Panelboard shall not exceed 78-inches in height from the finished floor.

b. Panelboards shall have a minimum of 25 percent spare capacity for future loads at the end of the project. Panelboards shall have a minimum of 25 percent spare circuit breakers. Spare circuit breakers shall be redundant of the type of circuit breaker being provided in the panelboard.

c. Panelboard busses shall be tin-plated copper only. Aluminum busses are not acceptable.

d. The phase loading on panelboards shall be balanced as much as practical by the type of loads on the panel. This includes equally disbursing the spares between the phases.

e. Panelboards shall be provided with an "As-Built" panel schedule which is typed and placed in a protective holder located on the front inside of the panelboard door.

f. Panels shall have hinged covers door-in-door construction with a master keyed flush tumbler latches.

g. All circuit breakers shall be bolt-on type breakers only. Stab-in breakers shall not be allowed.

h. Thermal-magnetic breakers larger than 150 amps shall have adjustable, instantaneous magnetic trip.

2.20 KWHR Meter

The kilowatt-hour meters shall be wall mounted within the main electrical room. KWHR meters with 15-minute demand registers shall be provided for recording energy consumption of the facility and shall also record maximum demand and power factor for each phase. Meters shall be provided with factory-installed electronic pulse initiators meeting ANSI C12.1 for connection to the BASE EMCS - (Energy Management and Control System). Pulse initiators shall be solid-state devices incorporating light-emitting diodes, phototransistors, and power transistors. Initiators must be
totally contained within demand meter enclosures, must be capable of operating up to speeds of 500 pulses per minute with no false pulses, and must require no field adjustments. Initiators shall be calibrated for a pulse rate output of 1 pulse per one-fourth disc revolution of the associated meter and must be compatible with the indicated equipment. Meter shall have tele-metering capability. Provide 1-inch conduit from transformer-mounted meter to the EMCS control panel.

2.21 Power System Analysis

2.21.1 Short Circuit Study

A full short circuit analysis shall be performed on the electrical distribution system for the building. The study shall include the interior electrical distribution system and service distribution system back to the existing primary line.

2.21.2 Protective Coordination Study

A full protective coordination study shall be performed on the electrical distribution system for the building. The study shall include the interior electrical distribution system and service distribution system back to the existing primary line.

2.21.3 Arc Flash Hazard Study

A full arc flash hazard study shall be performed in accordance with NFPA 70E, IEEE 1584 on the electrical distribution system for the building. The study shall include the interior electrical distribution system and service distribution system back to the existing primary line. The electrical system shall be designed such that no piece of electrical equipment receives greater than an arc flash hazard level of 2.

2.22 Motors

Motors shall be of sufficient size for the duty to be performed and shall not exceed the full-loading rating when the driven equipment is operating at specified capacity under the most severe conditions encountered.

a. Motors shall have open frames and continuous-duty classification and be based on a 40 degree C ambient temperature reference.

b. Permanently wired polyphase motors of 1 horsepower or more shall meet the minimum full-load efficiencies in NEMA MG 1 for NEMA Premium™ Efficiency Electric Motors, except that motors provided as an integral part of motor driven equipment are excluded from this requirement if a minimum seasonal or overall efficiency requirement is indicated for that equipment by the provisions of another section.

c. Power factor correction capacitors are to be installed with individual motors 25 HP and larger as a minimum, unless the motor is controlled by a variable frequency drive (VFD). In the case of VFD, capacitors are not required.

d. Motor starters shall use circuit breakers instead of fuses.

e. Thermal overloads shall be the bimetallic type that can be reset. The magnetic overload option shall only be used if indicated by the manufacturer of the equipment.
f. Reduced voltage starters shall be used on motors which are 50 Hp or larger as a minimum.

g. Three-phase motors shall have phase loss protection.

h. Disconnect switches for motors shall be heavy duty type. Exterior switches shall be rain-tight with in NEMA 4 enclosures. Disconnect switches for packaged HVAC equipment shall be as required by the equipment manufacturer.

g. Motors controlled by variable frequency drives shall have Class H wiring insulation and be rated for inverter duty.

2.23 General Purpose Duplex Receptacle Outlets

Duplex receptacle outlets for general purpose applications shall be NEMA WD 6 Type 5-20R, 20 amp, 125 volt, 2-pole, 3-wire grounding type. A maximum of five duplex general purpose receptacles may be connected to a 20A, 120V receptacle circuit. Receptacle circuits shall not supply lighting and motor loads. General purpose duplex receptacle outlets shall be located in the facility as follows:

a. Provide general-use duplex receptacles a minimum of 10-feet on center in offices and a minimum of every 25-feet along the walls in all other areas of the building except as otherwise indicated. For small rooms that do not have 10-foot walls, a minimum of one outlet shall be installed on each wall. Receptacles shall be mounted 18-inches above finished floor.

b. Provide general-use duplex receptacles a minimum of 50-feet on center in corridors with a minimum of one per corridor. Receptacles shall be mounted 18-inches above finished floor.

c. Provide one GFCI general-use duplex receptacles in each janitor's closet.

d. Provide general-use duplex receptacles adjacent to each telephone outlet and each cable jack.

e. Provide two general-use duplex receptacles adjacent to each telecommunications outlet within administrative spaces.

f. Provide a general purpose duplex receptacle outlet adjacent to sink in the restrooms. Receptacle outlets shall have (GFCI) ground fault circuit interrupters. Mount receptacle outlets 48-inches above finished floor. One women's restroom shall have an additional GFCI outlet located in one of the stalls.

g. The exact location of receptacle outlets shall be verified and coordinated with the Contracting Officer during the design of the project. Coordinate the location of the receptacle outlets with the Interior Design package (furniture layout). Power and communication to system furniture in open office spaces shall be served by connections to system furniture whenever possible. Feed system furniture from floor boxes. Power poles are not acceptable. Provide 8-wire, 4-circuit configuration to system furniture with #10 AWG neutral. Make final connections to the system furniture outlets.

h. Provide general-use duplex receptacles at break room countertops. A
minimum of two branch circuits shall be used to supply receptacles installed at the break room countertop. Receptacles installed at break room countertops shall be spaced such that no point along the wall line is more than 24 inches, measured horizontally, from a receptacle.

2.23.1 Special Receptacles

Ground Fault Circuit Interrupter (GFCI) receptacle outlets shall be provided in rest rooms, at sink countertops in restrooms and break rooms, in janitor's closets, at other wet locations, and for vending machines. Weatherproof GFCI receptacles for exterior use, shall be weatherproof whether or not plug is inserted and have a polycarbonate cover plate. Exact location of the receptacles noted below shall be coordinated with the Contracting Officer during the design of this project. Except where indicated otherwise, provide NEMA 5-20R, 20 amp, 125 volt, 2-pole, 3-wire grounding type, duplex receptacles in the following locations:

a. Provide a dedicated branch circuit and ground fault circuit interrupter receptacle for vending machines.

b. Provide a duplex receptacle outlet for each electric water cooler.

c. Provide duplex receptacle outlet for government furnished and government installed copiers, printers, scanners, shredders and fax machines in locations coordinated with the Contracting Officer. Provide a dedicated circuit for each copier, printer and shredder.

d. Provide a weatherproof duplex receptacle with ground fault circuit interrupter on the exterior of the building adjacent to each personnel exit door of the building. Mount receptacles 24-inches above finished grade. Provide additional receptacles around the exterior of the facility located for convenient access but at no more than 165-feet on center with a minimum of one per side.

e. Provide a dedicated branch circuit and duplex receptacle outlet for each of the EMCS panels.

f. Communications Equipment Room (CER): One rack with one NEMA L5-20R; one rack with two NEMA L5-20R; one rack with one NEMA L6-30R. Each rack shall be provided with a dedicated general purpose quaduplex receptacle fed from a separate dedicated 20A branch circuit. A minimum of two dedicated, unswitched, general purpose receptacles shall be installed within the CER; each fed from a separate dedicated 20A branch circuit. Additional convenience outlets shall be installed at 6-foot intervals around the CER perimeter walls with a minimum of one per wall.

g. Provide outlets where required by the NFPA 70 for servicing HVAC equipment.

h. The contractor shall install dedicated receptacles to power two sets of washer and dryers located in the laundry room. Type and rating of washer and dryer receptacles shall be coordinated with the equipment to be installed.

2.23.2 Computer Outlets

Computer receptacles shall be duplex, 20 amp, 120 volt, 2-pole, 3-wire grounding type receptacles. A maximum of four duplex computer outlets shall be connected to a receptacle circuit. Computer outlets shall be
labeled as "COMPUTER". Mount the outlets 18-inches above finished floor. Computer outlets shall be mounted adjacent to the telephone/data outlets. Maintain a separation of 6-inches from the telephone/data outlets. Exact location of all computer outlets shall be verified and coordinated with the Contracting Officer during the design of the project. Location of outlets shall be coordinated with the interior design package to include the furniture layout. One computer outlet shall be provided adjacent to every voice/data outlet. Provide capability for future alternate configurations.

2.24 Device Plates

Communication outlets, switches, receptacles, etc. shall be coordinated with the finish interior colors. Device plates shall be stainless steel in areas with finished walls. In areas with unfinished walls like mechanical walls, the device plate shall be galvanized steel.

2.25 Other Loads

Designer of Record shall coordinate with the other applicable sections. The anticipated loading and power configuration for some items will be provided, but the Designer of Record is still responsible for the final coordination with the actual equipment installed. Contractor shall provide electrical power to the following loads either by receptacle or direct wired as applicable. This list is representative and is not considered to be all-inclusive: Vending Machines; Microwaves; Garbage Disposals; Refrigerators; Water Coolers; Hoods; electric oven/ranges; Mechanical Equipment; Electrical Equipment; Communications Equipment; Fire Alarm Equipment; Podiums; Overhead Projectors; Motorized Screens; shredders, Automatic Door Operators; Gate Operators, Landscape Sprinkler Controls; Access Control Equipment, CCTV Monitors, Cameras.

2.26 Architectural/Mechanical Connections

Contractor shall provide branch circuits, disconnect switches, magnetic starters, and other related electrical equipment and material for architectural, mechanical equipment and environmental equipment to be installed in the project (includes the facility and site). This shall include hand dryers, HVAC units, chillers, humidifiers, and reheat, unit heaters, pumps, exhaust fans, heat tracing, and other mechanical equipment in the facility.

2.27 Wiring Methods

Wiring shall conform to NFPA 70 and the requirements of this section.

2.27.1 Conductors

Conductors shall be copper. Minimum power wiring shall consist of #12 AWG conductors installed in ½-inch conduits. Power and lighting conductors shall be 600 volt, Type THHN (in dry locations), and THWN-2 or XHHW (in wet locations). Cabling systems such as Mineral-insulated cables, metallic armored cables and nonmetallic-sheathed cables shall not be allowed on this project.

Conductors shall be sized based upon the 75°C column of NEC Table 310-15(B)(16). All wiring shall meet UL 2556, UL 44, UL 444, UL 486A-486B, UL 486C, UL 83, & UL 854.
2.27.2 Conduits

Wiring shall consist of insulated conductors installed in steel rigid metallic conduit (RMC), electrical metallic tubing (EMT), or intermediate metal conduit (IMC). Conduit size shall be based on use of single conductor cable with THW or RHW insulation for sizes #1 AWG and smaller. Flexible metal conduit (FMC) is permitted only where equipment vibration is a consideration. Plastic conduit is allowed only underground or under the floor slab. Raceways shall be concealed within finished walls, ceilings, and floors. Conduit that is exposed along walls in areas that are subject to damage shall be RMC. All raceways shall meet UL 1, UL 1569, UL 1660, UL 360, UL 5, UL 514B, UL 5A, UL 6, UL 651, & UL 651A.

2.28 Interior Lighting System

Provide according to the recommendations in UFC 3-530-01. If the designer chooses to use a networked lighting system of any kind, a Certification and Accreditation shall be obtained, refer to section 01 86 29 COMMUNICATIONS REQUIREMENTS for additional information. Products shall meet UL 1472, UL 1581, UL 20, UL 20, & UL 924.

2.28.1 Illumination Levels

Average maintained illumination levels shall not be less than the values listed in FC 4-179-03F. The illumination levels identified shall be maintained design intensity, including light loss factors. A light loss factor (LLF) of 0.7 shall be used when calculating lighting levels.

2.28.2 Conservation Requirements

Contractor shall optimize building performance by the use of occupancy sensors and the use of sensors to control loads based on the availability of natural light. Illumination levels, in conjunction with energy conservation, shall be obtained by the most life cycle cost-effective techniques including, but not limited to, the following:

a. Provide multiple switching of multi-lamp fixtures or multiple switching of fixture groups in large rooms, or both, to permit lighting fixtures to be turned off in unoccupied areas.

b. Provide LED fixture and drivers with a minimum of 85 percent efficiency, less than or equal to 20 percent THD, and with power factor correction to exceed 90 percent.

c. Occupancy and daylight sensors shall be used where recommended in UFC 3-530-01.

d. Location of light switches shall be coordinated with the floor plan and furniture layout to ensure that they are easily accessible and convenient. Location shall also be coordinated with the Contracting Officer.

2.28.3 Incandescent Lighting Fixtures

Incandescent lighting fixtures shall NOT be used.

2.28.4 LED Lighting Fixtures

Light emitting diode (LED) fixtures shall be dimmable or capable of
multi-level control with a CCT of 3000 K (unless otherwise indicated) and a 
CRI of no less than 80. Lighting in all offices and utility spaces shall 
have a CCT of 3985 K +/-275K. LED fixtures with screw base light sources 
are not permitted. Built in fixture failure detection shall be provided.

LED drivers shall have a total current harmonic distortion no greater than 
20 percent at full and 50 percent output and power factor greater than or 
equal to 90 percent at full and 50 percent output. Dimmable or bi-level 
drivers shall be compatible with standard dimmer control circuit or 0-10V. 
LED Fixtures shall meet ETL 12-15, & IES LM-79

2.28.5 Egress and Exit Lighting Fixtures

Egress and exit lighting design shall be in accordance with NFPA 101, and 
ICC IBC. Exit lights shall be green LED type with brushed aluminum faces. 
Incandescent exit lighting fixtures are not permitted. Egress and exit 
light fixtures shall have individual battery back up. Egress lighting 
fixtures shall be provided from room LED light fixtures throughout the 
facility. Emergency egress lighting shall be provided for common areas 
such as lobbies, corridors, restrooms and in utilitarian rooms such as 
mechanical rooms, electrical rooms, communications rooms, etc.

2.29 Energy Management Control System (EMCS)

Provide power as required for EMCS or DDC components (such as dampers, VAV 
boxes, control panels, etc.) requiring power.

2.30 Grounding System

The basis of all of the grounding for this project is initiated via an 
Earth Electrode System (EES) around the perimeter of each facility. All 
metallic objects that pass under or that are close within 6-feet of the EES 
shall be bonded to the EES. The Lightning Protection System (LPS) shall be 
connected to the EES via multiple down conductors. The EES shall be bonded 
to the duct bank guard wires and to the ground ring around the facility 
transformer. The EES shall be extended into the main electrical room to 
the MDS. The EES shall also be extended into the telecommunications 
entrance room where it shall be connected to the telecommunications main 
grounding busbar (TMGB)

The grounding system shall be designed in accordance with NFPA 70 Article 
250, IEEE 1100, API 32-1065, and the following criteria. Ground rods shall 
be ¾-inch x 10-foot copper clad steel.

Lightning protection component penetrations and attachments shall be sealed 
and flashed and anchored in a permanent manner and in a manner to avoid the 
degradation of the watertight integrity of the roof system. Do not cut or 
otherwise disturb the roof membrane. Mastic seals in the plane of the roof 
are unacceptable. Anchor plates set in mastic shall be set on roof surface 
cleaned of aggregate and loose material prior to mastic application.

2.30.1 Communications Grounding System

See COMMUNICATION REQUIREMENTS 01 86 29

Provide corrosion-resistant grounding busbar suitable for indoor 
installation in accordance with TIA-607. Busbars: plated for reduced
contact resistance. If not plated, clean the busbar prior to fastening the conductors to the busbar and apply an anti-oxidant to the contact area to control corrosion and reduce contact resistance. Provide a telecommunications main grounding busbar (TMGB) in the telecommunications entrance facility. The telecommunications main grounding busbar (TMGB: sized in accordance with the immediate application requirements and with consideration of future growth. Provide telecommunications grounding busbars with the following:

a. Predrilled copper busbar provided with holes for use with standard sized lugs,

b. Minimum dimensions of 0.25 in thick by 6 in wide for the TMGB with 36 inlength as required by the BAFB FEP IDG.

c. Listed by a nationally recognized testing laboratory.

2.30.2 Ground Bus

Copper ground bus: provided in the electrical equipment rooms with minimum dimensions of 0.25 in thick by 6 in wide by 24 in.

2.30.3 Equipment Grounding Conductors

A green equipment grounding conductor, sized in accordance with NFPA 70 shall be provided, regardless of the type of conduit. Equipment grounding bars shall be provided in panelboards. The equipment grounding conductors shall be carried back to the service entrance grounding connection or separately derived grounding connection. Equipment grounding conductors shall be provided in feeders and branch circuits.

2.30.4 Earth Electrode System

The maximum resistance measured of the earth electrode system shall not exceed 5 ohms under normally dry conditions. Ground rods shall be ¾-inch x 10-foot copper clad ground rods.

2.30.5 Separately Derived System

For dry-type transformers within buildings, the grounding electrode conductor shall be connected to adjacent structural steel or to a common grounding electrode conductor per the NEC. If there are multiple dry-type transformers within a room, a copper ground bar shall be used as the connection point. This bar shall be bonded to the grounding electrode or common grounding electrode conductor. The grounding bars and the conductors shall be sized to handle the combined fault duty of the equipment connected. Use exothermic welds for the connection.

2.31 Equipment Sizing Requirements and Ratings

Except as specifically noted otherwise, minimum required capacity of the equipment bus shall be computed from the estimated maximum demand (EMD) for the panelboard, switchboard, motor control center and be specified as having the next larger manufactured standard bus or main lug size.

The EMD shall be calculated as indicated in Omaha District Design Guide, ODDG.

Overcurrent protection for panelboards, switchboards, switchgear and motor control centers with heavy motor loads, sizing must also consider starting
current of the largest motor or motors in addition to the continuous demand amperes.

2.31.1 Interrupting Capacities

Equipment ratings shall be determined based on results of the short circuit analysis per the ODDG. Minimum standard interrupting ratings shall be identified on the plans preferably on a one-line diagram or alternately in panel schedules. Ratings may be called out in the specifications when single items are involved. The designer shall identify variables (such as equipment impedances) which could affect available short circuit current and verify that equipment acceptable under contract plans and specifications would not permit fault current levels higher than the specified interrupting ratings.

2.31.2 Feeders and Branch Circuits

Branch circuit sizes shall be based on the load supplied, EMD and voltage drop requirements. Feeders to distribution equipment such as panelboards, motor control centers, and switchboards shall be sized to allow the full capacity of the panelboards, motor control centers, and switchboards bus bar amperage rating to be used. Voltage drop shall be taken into account when sizing branch circuits. Feeder conductors shall be sized for a maximum voltage drop of 2 percent at design load. Branch circuit conductors shall be sized for a maximum voltage drop of 3 percent at design load.

2.31.3 Transformer Feeders

Sizes for primary and secondary feeders for transformers shall be based on the transformer kVA. This criteria also applies to the service entrance conductors. Feeder ampacity shall not be less than the rating of the overcurrent device at the termination of the secondary conductors.

2.31.4 Neutral Sizing

Use of full size neutrals shall be standard practice. For applications involving harmonics generating equipment (inverter, variable frequency drives, other solid state apparatus), the neutral must be treated as a current carrying conductor. Multi-wire branch circuits with common neutrals shall not be permitted to serve data processing applications, including personal computers, but branch circuits shall have an individual neutral for each phase conductor.

2.31.5 Derating

Ampacity of conductors is to be derated per NEC Article 310, if more than three current carrying conductors are installed in a raceway. Four-wire feeders where the neutral is considered a current carrying conductor shall have an additional 20 percent derating. A maximum of nine current carrying conductors, using NEC designated derating factors, shall be installed in any raceway. When nonlinear loads are served, the neutral must be treated as a phase conductor. If a double size neutral is employed, count it as two line conductors.

2.31.6 Nuisance Tripping

For a period of one year after construction, the contractor shall be responsible for correcting problems which may arise from nuisance tripping.
Nuisance tripping shall be defined as having breakers or fuses activating under an overload condition while the equipment was operating within manufacturer parameters. These situations shall be corrected by making changes to the installation at no cost to the Government. These corrections can increase the trip setting or fuse size, as long as the increased setting is still at or below setting maximums given in NFPA 70. Any change could impact other items not listed such as conductor sizing and upstream coordination settings.

Any changes made to correct nuisance tripping shall be incorporated into the protective coordination and arc flash hazard studies and updated arc flash labels shall be provided for equipment as necessary at no additional cost to the government.

2.32 Installation

The Contractor shall install system components, switchboards, generator, panels, lighting, equipment connections, etc., including Government furnished equipment, and appurtenances in accordance with the manufacturer's instructions and shall furnish necessary connectors, terminators, interconnections, services, and adjustments required for a complete and operable system. Interior wiring, including low voltage wiring, shall be installed in steel conduit. Minimum conduit shall be 1/2-inch. Flexible cords or cord connections shall not be used to supply power to any components, except where specifically allowed in writing by the Contracting Officer. Grounding shall be installed as necessary to preclude ground loops, noise, and surges from adversely affecting system operation. The installation wiring shall use terminal strips, wire nuts, or crimp terminals. Devices shall use terminal points, strips or screw terminals for the wiring connections points - pigtail connections are not acceptable. If the manufacturer needs to use special cable e.g. twisted and shielded, then the minimum wire size and insulation voltage rating shall be met.

PART 3 FIELD QUALITY CONTROL

3.1 Testing

Furnish test equipment and personnel and submit written copies of test results. Give Contracting Officer 5 working days notice prior to each test.

As a minimum, test equipment according to the applicable commissioning procedures in NECA 90. Document the test results and take corrective actions, as necessary, based on these results.

3.2 Devices Subject to Manual Operation

Operate each device subject to manual operation at least five times, demonstrating satisfactory operation each time.

3.3 600-Volt Wiring Test

Test wiring rated 600 volt and less to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 500 volts to provide direct reading of resistance. Minimum resistance: 250,000 ohms.
3.4 Transformer Tests

Perform the standard, not optional, tests in accordance with the Inspection and Test Procedures for transformers, dry type, air-cooled, 600 volt and below; as specified in NETA ATS. Measure primary and secondary voltages for proper tap settings. Tests need not be performed by a recognized independent testing firm or independent electrical consulting firm.

3.5 Ground-Fault Receptacle Test

Test ground-fault receptacles with a "load" (such as a plug in light) to verify that the "line" and "load" leads are not reversed.

3.6 Grounding System Test

Test grounding system to ensure continuity, and that resistance to ground is not excessive. Test each ground rod for resistance to ground before making connections to rod; tie grounding system together and test for resistance to ground. Make resistance measurements in dry weather, not earlier than 48 hours after rainfall. Submit written results of each test to Contracting Officer, and indicate location of rods as well as resistance and soil conditions at time measurements were made.

3.7 Watthour Meter

a. Visual and mechanical inspection
   (1) Examine for broken parts, shipping damage, and tightness of connections.
   (2) Verify that meter type, scales, and connections are in accordance with approved shop drawings.

b. Electrical tests
   (1) Determine accuracy of meter.
   (2) Calibrate watthour meters to one-half percent.
   (3) Verify that correct multiplier has been placed on face of meter, where applicable.

-- End of Section --
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PART 1 GENERAL

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PART 1   GENERAL

1.1   REFERENCES

Publications, codes, specifications and standards shall be used as the basis for the project design and shall include, but not be limited to the following:

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)


AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)


ASTM D1557 (2012) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2700 kN·m/m³)

U.S. AIR FORCE (USAF)

AF ETL 11-1 (2011) Civil Engineer Industrial Control System Information Assurance Compliance

BUILDING INDUSTRY CONSULTING SERVICE INTERNATIONAL (BICSI)


U.S. DEFENSE INTELLIGENCE AGENCY (DIA)


U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 8500.01 (2014) Cybersecurity

DOD 8510.01 (2014; Change 1-2016) Risk Management
Framework (RMF) for DoD Information Technology (IT)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

36 CFR 1191 Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines

U.S. DEPARTMENT OF AGRICULTURE (USDA)

RUS Bull 345-65 (1985) Shield Bonding Connectors (PE-65)
RUS Bull 345-83 (1979; Rev Oct 1982) Gas Tube Surge Arrestors (PE-80)
RUS Bull 1753F-401 (1995) Splicing Copper and Fiber Optic Cables (PC-2)
RUS 1755 Telecommunications Standards and Specifications for Materials, Equipment and Construction
RUS Bull 1753F-201 (1997) Acceptance Tests of Telecommunications Plant (PC-4)

INSULATED CABLE ENGINEERS ASSOCIATION (ICEA)

ICEA S-98-688 (2012) Broadband Twisted Pair Telecommunication Cable, Aircore, Polyolefin Insulated, Copper Conductors Technical Requirements
ICEA S-99-689 (2012) Broadband Twisted Pair Telecommunication Cable Filled, Polyolefin Insulated, Copper Conductors Technical Requirements

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)


UNDERWRITERS LABORATORIES (UL)

UL 497 (2001; Reprint Jul 2013) Protectors for Paired Conductor Communication Circuits
UL 83 (2014) Thermoplastic-Insulated Wires and Cables
U.S. DEPARTMENT OF DEFENSE (DOD)

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

TIA-1152 (2009) Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling


TIA-472D000 (2007b) Fiber Optic Communications Cable for Outside Plant Use

TIA-492AAAA (2009b) 62.5-um Core Diameter/125-um Cladding Diameter Class 1a Graded-Index Multimode Optical Fibers

TIA-526-14 (2015c) OFSTP-14A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant

TIA-568-C.0 (2009; Add 1 2010; Add 2 2012) Generic Telecommunications Cabling for Customer Premises

TIA-568-C.1 (2009; Add 2 2011; Add 1 2012) Commercial Building Telecommunications Cabling Standard

TIA-568-C.2 (2009; Errata 2010) Balanced Twisted-Pair Telecommunications Cabling and Components Standards

TIA-568-C.3 (2008; Add 1 2011) Optical Fiber Cabling Components Standard

TIA-569 (2012c; Addendum 1 2013; Errata 2013) Commercial Building Standard for Telecommunications Pathways and Spaces

TIA-606 (2012b) Administration Standard for the Telecommunications Infrastructure

TIA-607 (2011b) Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises

TIA/EIA-598 (2014d) Optical Fiber Cable Color Coding

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

UNDERWRITERS LABORATORIES (UL)

UL 497 (2001; Reprint Jul 2013) Protectors for Paired Conductor Communication Circuits

UL 83 (2014) Thermoplastic-Insulated Wires and
1.2 DEFINITIONS

Unless otherwise specified or indicated, electrical and electronics terms used in this specification shall be as defined in TIA-568-C.2, TIA-568-C.3, TIA-606, and IEEE 100 and herein.

1.3 Coordination of Communications Criteria

All communications criteria provided in this section shall be coordinated with all other sections of the RFP. The locations of all equipment indicated in the communications requirements are approximate. Contractor shall coordinate the final number/locations of all equipment with the Contracting Officer. Contractor shall meet the requirements of the Americans with Disabilities Act (ADA) 36 CFR 1191, Uniform Federal Accessibility Standards (UFAS) requirements.

1.4 INTERIOR BLDG. REQUIREMENTS

1.4.1 Interior Communications Cabling Systems

All voice and data communications design shall be performed by a BICSI Registered Communications Distribution Designer (RCDD). The communications media (Telephone cables, LAN cables and fiber optic cables) shall be installed by BICSI certified technicians and installers. The structured cabling system shall be certified by the manufacturer with the longest warranty available. All work shall be in accordance with TIA-568-C.0, TIA-568-C.1, TIA-568-C.2, TIA-568-C.3, NFPA 70, TIA-569, TIA-606, TIA-607, ETL 02-12, DIA DCID 6/9, UFC 3-580-01, and the BICSI TDMM and OSPDRM.

The design shall form a complete voice and data communications system, including, but not limited to: wires, terminations, raceway, cable tray, cabinets/racks, outlets, etc. All wiring shall be tested; sample testing shall not be permitted. Design and installation shall be provided by BICSI (Building Industry Consulting Services International) certified personnel. Proof of certification must be provided. The installed structured cable system shall be certified by the manufacturer and installer to perform at EIA/TIA standards for Category 6 performance for a period of not less than 15 years. The contractor shall provide the required warranty to support the system certification. An RCDD shall be on site at all times during the installation.

All interior communication wiring systems shall have the cabling labeled
with a unique alphanumeric number at beginning and end termination points of the cable. The alphanumeric number shall also be placed by the jack on the device plate.

A record of all communication wiring installed by this contract shall be provided in a Windows based cable management software along with a hard copy of the printout. A licensed copy of the cable management software shall be provided. Labeling shall be done per the requirements of Buckley AFB.

1.4.2 Security Classifications and Requirements

All backbone riser cable shall be unclassified cable unless otherwise noted.

1.4.3 Cable TV (CATV)

Wiring for CATV shall not be provided for this building. It shall only include rough-ins with outlets & plates.

Space shall be made available within the telecommunications room for the future installation of equipment by satellite providers.

1.4.4 Cable Types

This facility shall be pre-wired for voice, and data communication systems.

Horizontal cabling shall be Category-6 unshielded twisted pair (UTP) copper cable, Category 6-shielded twisted pair (STP) copper cable. All cables shall be Plenum rated.

1.4.5 Riser/Backbone Cable

A new 25 pair, 24 AWG, UTP copper cable shall be routed to the new main Telecommunications Room (TR). The 25 pair shall be terminated on wall mount 110 Type blocks. This cable serves as a connection point for all horizontal voice cables terminated in this space.

For data, 1 - 24 strand multi-mode fiber optic backbone cable shall also be routed to the new main TR. All fiber optic cables shall be installed in innerduct. All fiber optic cables in the new main TR terminate in rack mount patch panels. All fiber optic cables will utilize non-mechanical ST style connectors.

1.4.6 Horizontal Cable

All copper horizontal cabling shall be Category-6 UTP. See outlet requirements for cabling quantities. Telephone cabling shall be white and data cabling shall be blue.

1.4.7 Telephone/Data Cables

Copper cables for voice and data serving administrative areas shall be 24 AWG, 4 pair, TIA-568-C.2 Category-6, unshielded twisted pair (UTP), plenum rated, solid copper station cable. All cables including patch cords shall be tested meeting TIA-1152, for Category 6 performance. Extrapolation from a lower frequency is not allowed. The installation acceptance test shall be a "channel test" and includes all patch connections and cables. Testing
shall be accomplished with a Cat 6, Level III compliant tester. One cable shall be dedicated to one jack. Daisy chaining is not be permitted.

1.4.8 Components

All passive components of the communications distribution system, such as patch panels, interconnection cabling, patch cords, wire manager, termination backboards, communication racks/cabinets, outlet boxes and raceway systems, jacks, and connectors shall be included. Provide one horizontal wire manager for each patch panel installed and one vertical wire manager for each 2-post equipment rack installed.

Active electronic components such as computers, hubs, routers, telephone instruments, VCR's, TV's, and other electronic LAN and communications equipment will be provided by government.

This project shall also install conduit and pull string to accommodate the future installation by others of the following systems:

a. CCTV camera system which will monitor the building perimeter, parking lot, corridors, stairwells, and common rooms.

b. Keyless access system, refer to section 01 82 00 Architectural Building Requirements for additional information.

c. CATV system which will utilize satellite system.

Wiring requirements for the above listed items shall be coordinated through the COR.

1.5 Outlet Requirements

All administrative spaces within the building shall be provided with the number of outlets, as indicated in FC 4-179-03F. The standard telecommunications outlet for administrative spaces consists of two 8-pin/8-position CAT 6 modular USOC RJ-45 jacks mounted in a single faceplate (one jack for telephone and one for data use) co-located with two duplex 120-VAC, 60-Hz general-purpose electrical receptacles. Refer to section 01 86 26 Electrical Requirements for additional information. All wall outlet telephone jacks shall be wired for use with VoIP telephones.

All voice and data cables shall be routed to the communications room.

1.6 INTERIOR PATHWAYS AND SPACES

1.6.1 Cable Tray

All distribution of cable throughout the building shall be via conduit and cable tray. The cable tray shall be a welded wire type tray a minimum of 12" (w) x 4" (d). Cable tray within the communications rooms shall be ladder type. Cable tray that passes through mechanical spaces or that transitions between floors shall be totally enclosed type with removable covers.

Provide 12 inches of clearance above cable trays for future access. Contractor must coordinate with other disciplines to insure clearances can be achieved.

All cables shall be in 1" EMT Conduit between the cable tray and outlet
locations.

1.6.2 Labeling

Terminations shall be labeled and color-coded in accordance with ETL 02-12, and TIA-606.

1.6.3 Racks

Racks shall be floor mounted modular type, 16 gauge steel or 11 gauge aluminum construction, minimum, treated to resist corrosion. Provide rack with vertical and horizontal cable management channels, top and bottom cable troughs, grounding lug. Rack shall be compatible with 19 inches panel mounting. Contractor shall coordinate with the 460 SCS for all actual equipment, including racks, etc., and with the most recent edition of the Buckley AFB Communications & Cabling Design Standard.

1.6.4 Backboards

Provide void-free, interior grade A-C plywood 3/4 inch thick 4 by 8 feet. Backboards shall be fire rated by manufacturing process. Fire stamp shall be clearly visible. Backboards shall be provided on a minimum of two adjacent walls in the telecommunication spaces.

1.6.5 Terminations

Terminate UTP cable in accordance with TIA-568-C.1, TIA-568-C.2 and wiring configuration as specified. Terminate fiber optic cables in accordance with TIA-568-C.3.

1.6.6 Connector Blocks

Provide insulation displacement connector (IDC) Type 110 for Category 6 systems. Provide blocks for the number of horizontal and backbone cables terminated on the block plus 25 percent spare.

1.7 Certification

Any information system that is installed shall be DIACAP/RMF certified by the designated approving authority as determined by the installation.

All control systems must be planned, designed, acquired, and executed in accordance with DOD 8500.01, DOD 8510.01, AF ETL 11-1, and as required by individual Service Implementation Policy.

1.8 Telecommunications Entrance Facility

1.8.1 TER

1.8.1.1 Telecommunications Room

Communication closet sizes must be no smaller than 10’x10’ in small facilities and 1.1% of the facility size in large critical facilities and information transfer nodes unless written permission is obtained from the 460 SCS for a deviation.
1.8.1 Building Protector Assemblies

Provide self-contained units supplied with a field cable stub factory connected to protector socket blocks to terminate and accept protector modules for outside cable. Building protector assembly shall have interconnecting hardware for connection to interior cabling at full capacity. Provide manufacturers instructions for building protector assembly installation.

1.8.1.2 Protector Modules

Provide in accordance with UL 497 electrode gas tube or solid state type rated for the application. Provide gas tube protection modules in accordance with RUS Bull 345-83 and shall be heavy duty, A>10kA, B>400, C>65A where A is the maximum single impulse discharge current, B is the impulse life and C is the AC discharge current in accordance with ANSI C62.61. The gas modules shall shunt high voltage to ground, fail short, and be equipped with an external spark gap and heat coils in accordance with UL 497. Provide the number of surge protection modules equal to the number of pairs of exterior cable of the building protector assembly.

1.9 OSP Wire and Cable

Outside plant includes all cable pathways, splicing, trenching, plowing, pole mounting hardware, duct banks, cable vaults, hand holes, pull boxes, main distribution frames and pedestals.

1.9.1 Exterior Construction Standards

New facilities are required to bring communication lines back to the nearest information transfer node, there is no spare infrastructure in manholes on Buckley for facilities to connect too.

a. Duct bank shall consist of a 2 x 4" duct minimum, concrete encased, 4 inch schedule 40 PVC or 80 PVC conduits, unless otherwise authorized by 460 SCS. Duct bank to be installed at a minimum depth of 24" measured from the top of the duct bank and 18" minimum where installed under roads and walkways.

b. One 4" conduit shall contain inner ducts. Innerduct authorized for use on Buckley is either multi-celled or blown in innerduct that will allow a minimum of six cells or blown in mesh innerduct per 4" duct. Fiber is mandated to be installed in innerduct; copper must be installed in innerduct when small cable counts would not utilize the full duct properly. All ducts to have pre-lubricated measuring pulling tape with a minimum breaking strength of 1,200 lbs (i.e. Mule Tape) secured at each end. When performing duct placement, new ducts shall be swept down and installed in the lowest available duct position within the lowest available duct window in the MH/HH.

c. Install one tracer wire per duct bank. Place the tracer wire centered on the top duct formation. Tracer wire shall be terminated at MH/HH in the test well or in lip of ring. In this configuration the base locators will not have to enter the MH/HH. After installation, test the tracer wire to verify continuity of the tracer wire system and provide a continuity report.
d. All underground cables shall include a maintenance loop and shall be labeled where it enters and exits the maintenance hole. Labeling shall be done in accordance with Buckley AFB and Accordance with TIA-606.

1. Provide tags for each telecommunications cable or wire located in manholes, handholes, and vaults. Handwritten labeling is unacceptable.

Conduit systems will not exceed 500' between pull points and will not exceed a total of 180 degrees in bends between pull points. Pull points are manholes unless handholds are specifically authorized by the 460 SCS.

Buckley Communication Installation Standard is mandatory and will detail industry standards, references, and installation practices that must be adhered to on Buckley AFB.

1.9.2 Cable Pulling

Test duct lines with a mandrel and swab out to remove foreign material before the pulling of cables. Avoid damage to cables in setting up pulling apparatus or in placing tools or hardware. Do not step on cables when entering or leaving the manhole. Do not place cables in ducts other than those shown without prior written approval of the Contracting Officer. Roll cable reels in the direction indicated by the arrows painted on the reel flanges. Set up cable reels on the same side of the manhole as the conduit section in which the cable is to be placed. Level the reel and bring into proper alignment with the conduit section so that the cable pays off from the top of the reel in a long smooth bend into the duct without twisting. Under no circumstances shall the cable be paid off from the bottom of a reel. Check the equipment set up prior to beginning the cable pulling to avoid an interruption once pulling has started. Use a cable feeder guide of suitable dimensions between cable reel and face of duct to protect cable and guide cable into the duct as it is paid off the reel. As cable is paid off the reel, lubricate and inspect cable for sheath defects. When defects are noticed, stop pulling operations and notify the Contracting Officer to determine required corrective action. Cable pulling shall also be stopped when reel binds or does not pay off freely. Rectify cause of binding before resuming pulling operations. Provide cable lubricants recommended by the cable manufacturer. Avoid bends in cables of small radii and twists that might cause damage. Do not bend cable and wire in a radius less than 10 times the outside diameter of the cable or wire.

1.9.2.1 Pulling Eyes

Equip cables 1.25 inches in diameter and larger with cable manufacturer's factory installed pulling-in eyes. Provide cables with diameter smaller than 1.25 inches with heat shrinkable type end caps or seals on cable ends when using cable pulling grips. Rings to prevent grip from slipping shall not be beaten into the cable sheath. Use a swivel of 3/4 inch links between pulling-in eyes or grips and pulling strand.

1.9.3 Maintenance Holes (MH) and Hand Holes (HH)

The standard communication manhole is an 8’x8’x8’ octagonal manhole with built in ladder. A locking mechanism inside the lid matching the existing system on Buckley. The lid must be cast to say “COMMUNICATIONS” and all materials installed in the manhole will be resistant to corrosion or rust.
a. MH/HH placement and specifications shall be in accordance with base guidelines. Additional requirements for every newly installed standard MH/HH shall include an approved galvanized ladder, support bar and C-Steps.

b. All newly constructed MH/HH and duct banks shall have a 12 AWG insulated solid copper tracer wire installed with them and terminated either on a test lug inside the MH/HH lip or at the test well located directly adjacent to MH/HH.

c. Maintenance holes shall have a locking lid. The contractor shall provide a padlock per the specifications of the 460 SCS.

d. MH/HH placement shall be scheduled and observed by a Quality Assurance Representative from the 460 SCS.

e. MH/HH shall be stenciled in accordance with Buckley AFB guidelines and shall use 460 SCS numbers (Contact 460 SCS POC for MH/HH numbering scheme).

f. Hand-holes shall be precast with the preferred size of 4 feet W by 4 feet L by 4 feet H standard type with pull hooks if approved by the 460 SCS.

g. All maintenance holes and hand holes shall have a ground rod and bonding ribbon in accordance with base guidelines.

h. Horizontal Unistrut channels are the preferred method of anchoring the vertical cable racks in the MH.

1.9.4 Copper Conductor Cable

Solid copper conductors, covered with an extruded solid insulating compound. Insulated conductors shall be twisted into pairs which are then stranded or oscillated to form a cylindrical core. For special high frequency applications, the cable core shall be separated into compartments. Cable shall be completed by the application of a suitable core wrapping material, a corrugated copper or plastic coated aluminum shield, and an overall extruded jacket. Telecommunications contractor shall verify distances between splice points prior to ordering cable in specific cut lengths. Gauge of conductor shall determine the range of numbers of pairs specified; 19 gauge (6 to 400 pairs), 22 gauge (6 to 1200 pairs), 24 gauge (6 to 2100 pairs), and 26 gauge (6 to 3000 pairs).

For installation underground provide filled cable meeting the requirements of ICEA S-99-689.

1.9.5 Fiber Optic Cable Specifications

Provide single-mode fiber optic cable. Provide optical fibers as indicated. Fiber optic cable shall be specifically designed for outside use with loose buffer construction. Provide fiber optic color code in accordance with TIA/EIA-598.

Provide strength members with sufficient tensile strength for installation and residual rated loads to meet the applicable performance requirements in accordance with ICEA S-87-640. The strength member is included to serve as
a. The type of protective covering required for fiber optic cables installed in a variety of methods and differing environments situations are identified in Buckley AFB 460 SCS guidelines and as noted in Table 1.4.4 below.

<table>
<thead>
<tr>
<th>Table 1.4.4: Protective of Fiber Optic Cable</th>
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<tbody>
<tr>
<td><strong>DIRECT BURIAL</strong></td>
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<tr>
<td>JACKET LAYERS: Double</td>
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<tr>
<td>ARMOR: Double</td>
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<tr>
<td><strong>DUCT BANK</strong></td>
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<tr>
<td>JACKET LAYERS: Single</td>
</tr>
<tr>
<td>ARMOR: Single</td>
</tr>
<tr>
<td><strong>CONCRETE ENCASED DUCT BANK</strong></td>
</tr>
<tr>
<td>JACKET LAYERS: Single</td>
</tr>
<tr>
<td>ARMOR: Dielectric</td>
</tr>
</tbody>
</table>

b. All new terminating connectors for fiber optic cable shall be LC connector.

Provide multimode 62.5/125-um, 0.275 aperture fiber optic cable in accordance with TIA-492AAAA, TIA-472D000, and ICEA S-87-640 including any special requirements made necessary by a specialized design. Provide 12 optical fibers. Fiber optic cable shall be specifically designed for outside use with loose buffer construction. Provide fiber optic color code in accordance with TIA/EIA-598.

1.10 Splices Cases and Splicing Standards

1.10.1 General

When existing copper splice cases are re-entered to place an additional cable, the entry end cap and all sealing tape on the cable going through that end cap shall be replaced followed by the closing of the case. Depending on the type of case and manufacturers recommendations, a sustainment test shall be performed by pressurizing the splice case. Filled splice cases are not the preferred method of installation. Do not place re-enterable compound in a splice case. Preferred splice case type is a "PLP" or equivalent. All end plates will be "Field Drilled" to ensure proper cable sizing and proper tape layering.

1.10.2 In Vault or Manhole

Provide underground closure suitable to house splice organizer in a protective housing into which can be poured an encapsulating compound. Closure shall be of thermoplastic, thermoset, or stainless steel material supplying structural strength necessary to pass the mechanical and electrical requirements in a vault or manhole environment. Encapsulating compound shall be reenterable and shall not alter the chemical stability of the closure.

1.10.3 Copper Splicing Standards

a. All copper splicing on Buckley AFB will be done to OSPDRM, and RUS Bull 1753F-401. This will include single fold back method.
splices. All splices shall be done in a high quality workmanship and neatness. Provide splice connectors with a polycarbonate body and cap and a tin-plated brass contact element. Connector shall accommodate 22 to 26 AWG solid wire with a maximum insulation diameter of 0.065 inch. Fill connector with sealant grease to make a moisture resistant connection. Final product shall be inspected and approved by the 460 SCS.

b. Cable identification integrity shall be maintained through all super binder and binder groups by using Mylar binder wraps crimped in the splice module.

c. Cables greater than 25 pairs shall be spliced using multipair splicing connectors, which accommodate 25 pairs of conductors at a time. Provide correct connector size to accommodate the cable gauge of the supplied cable.

1. "Pair Protectors" shall be used on all splices.

d. Sizing of bonding bullets; sizing will be appropriate to cable size, i.e.: #2- 25-200 pair, #3 200-400 pair, #4 400-900 pair, #5 900-1800 pair.

e. Cables sized 600 pairs or less use a two bank splice feeding equally from each directions.

1.10.4 Shield Connectors

Provide connectors with a stable, low-impedance electrical connection between the cable shield and the bonding conductor in accordance with RUS Bull 345-65.

1.10.5 Grounding and Bonding Conductors

Provide grounding and bonding conductors in accordance with RUS 1755.200, TIA-607, IEEE C2, and NFPA 70. Solid bare copper wire meeting the requirements of ASTM B1 for sizes No. 8 AWG and smaller and stranded bare copper wire meeting the requirements of ASTM B8, for sizes No. 6 AWG and larger. Insulated conductors shall have 600-volt, Type TW insulation meeting the requirements of UL 83.

1.11 Conduit

Provide conduit as specified in Section 01 86 26 ELECTRICAL REQUIREMENTS.

1.12 Pedestals

Pedestals shall be Emerson UPC Pedestal, Emerson CAD 4, 6, 8 styles or approved equal.

PART 2 TESTS, INSPECTIONS, AND VERIFICATIONS

2.1 Testing

Test 100 percent OTDR test of FO media at the factory in accordance with TIA-568-C.1 and TIA-568-C.3. Use TIA-526-14 Method B for multi mode fiber measurements. Calibrate OTDR to show anomalies of 0.2 dB minimum. Enhanced performance filled OSP copper cables, referred to as Broadband Outside
Plant (BBOSP), shall meet the requirements of ICEA S-99-689. Enhanced performance air core OSP copper cables shall meet the requirements of ICEA S-98-688. Submit test reports, including manufacture date for each cable reel and receive approval before delivery of cable to the project site.

2.1.1 Quality Control & Acceptance Testing

Perform acceptance testing in accordance with RUS Bull 1753F-201 and as further specified in this section. Provide personnel, equipment, instrumentation, and supplies necessary to perform required testing. Notification of any planned testing shall be given to the Contracting Officer at least 14 days prior to any test unless specified otherwise. Testing shall not proceed until after the Contractor has received written Contracting Officer's approval of the test plans as specified. Test plans shall define the tests required to ensure that the system meets technical, operational, and performance specifications. The test plans shall define milestones for the tests, equipment, personnel, facilities, and supplies required. The test plans shall identify the capabilities and functions to be tested. Provide test reports in booklet form showing all field tests performed, upon completion and testing of the installed system. Measurements shall be tabulated on a pair by pair or strand by strand basis.

a. Contractor shall submit a detailed test plan for all the cable plant installation for government review and concurrence. Include information on the test equipment and its calibration documentation.

b. All testing shall be conducted using TIA/EIA standards and with all equipment within current manufacturer's recommended time frame for calibration. A copy of the calibration certification shall be carried with all equipment and be presented upon request by 460 SCS designated representative (PM or QA). If equipment is not within current manufacturer's recommended time frame, test results shall be rejected by the 460 SCS and no telecommunication services will be activated in the tested facility until corrected and retested.

c. OSP Cable Testing

1. OSP Copper Cable

Every OSP copper cable pair installed/repairs shall be tested per the TIA-568-C.2 specifications using a cable tester that meets TIA-1152.

a. Wire map (pin to pin continuity)

b. Continuity to remote end

c. Crossed pairs

d. Reversed pairs

e. Split pairs

f. Shorts between two or more conductors

2. OSP Fiber Optic Cable
All OSP fiber strands shall be tested with OTDR and power meter / light source. OTDR shall be dual frequency, launch and receive cable. Power meter/light source shall be dual frequency/bi-directional.

a. OTDR Test: The OTDR test shall be used to determine the adequacy of the cable installations by showing any irregularities, such as discontinuities, micro-bendings or improper splices for the cable span under test. Hard copy fiber signature records shall be obtained from the OTDR for each fiber in each span and shall be included in the test results. The OTDR test shall be measured in both directions. A reference length of fiber, 66 feet minimum, used as the delay line shall be placed before the new end connector and after the far end patch panel connectors for inspection of connector signature. Conduct OTDR test and provide calculation or interpretation of results in accordance with TIA-526-14 for multimode fiber. Splice losses shall not exceed 0.3 db.

b. Attenuation Test: End-to-end attenuation measurements shall be made on all fibers, in both directions, using a 1550 nanometer light source at one end and the optical power meter on the other end to verify that the cable system attenuation requirements are met in accordance with TIA-526-14 for multi-mode fiber optic cables. The measurement method shall be in accordance with TIA-455-78-B. Attenuation losses shall not exceed 5.0 db/km at 850 nm and 1.5 db/km at 1300 nm for multimode fiber.

c. Bandwidth Test: The end-to-end bandwidth of all multimode fiber span links shall be measured by the frequency domain method. The bandwidth shall be measured in both directions on all fibers. The bandwidth measurements shall be in accordance with TIA/EIA-455-204.

d. Test Result Formatting

1. All test results can be submitted in softcopy format in original form and PDF.

2. All failed readings found require a description of corrective actions taken.

3. Test plans, test results, test equipment calibration certification and test documentation shall be included in the record drawing set. A copy of the test document shall be received in the NEC at a minimum of 10 days prior to pre-final inspection of facility or building complex (2 or more buildings sharing infrastructure resources).

2.1.2 Verification Tests

UTP backbone copper cabling shall be tested for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors, and between conductors and shield, if cable has overall shield. Test operation of shorting bars in connection blocks. Test cables after termination but prior to being cross-connected.

2.1.3 Performance Tests

Perform testing for each outlet as follows:
a. Perform Category 6 link tests in accordance with TIA-568-C.1 and TIA-568-C.2. Tests shall include wire map, length, insertion loss, NEXT, PSNEXT, ELFEXT, PSELFEXT, return loss, propagation delay, and delay skew.

b. Optical Fiber Links. Perform optical fiber end-to-end link tests in accordance with TIA-568-C.3.

2.1.4 Final Verification Tests

Perform verification tests for UTP and optical fiber systems after the complete telecommunications cabling and workstation outlet/connectors are installed.

2.2 Cable Inspection

Promptly repair indicated utility lines or systems damaged during site preparation and construction. Damages to lines or systems not indicated, which are caused by Contractor operations, shall be treated as "Changes" under the terms of the Contract Clauses. When Contractor is advised in writing of the location of a nonindicated line or system, such notice shall provide that portion of the line or system with "indicated" status in determining liability for damages. In every event, immediately notify the Contracting Officer of damage.

Handle cable and wire provided in the construction of this project with care. Inspect cable reels for cuts, nicks or other damage. Damaged cable shall be replaced or repaired to the satisfaction of the Contracting Officer. Reel wraps shall remain intact on the reel until the cable is ready for placement.

2.3 Soil Density Tests

a. Determine soil-density relationships for compaction of backfill material in accordance with ASTM D1557, Method D.

See Section 01 86 26 ELECTRICAL REQUIREMENTS for further requirements.
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11/05

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ASTM INTERNATIONAL (ASTM)
- ASTM D977 (2013; E 2014) Emulsified Asphalt
- ASTM D2027/D2027M (2013) Cutback Asphalt (Medium-Curing Type)
- ASTM D2028/D2028M (2010) Cutback Asphalt (Rapid-Curing Type)

AMERICAN WATER WORKS ASSOCIATION (AWWA)
- AWWA C651 (2014) Standard for Disinfecting Water Mains

CODE OF FEDERAL REGULATIONS (CFR)
- 28 CFR Part 36 ADA Standards for Accessible Design

U.S. ARMY CORPS OF ENGINEERS (USACE)
- EM 1110-1-1002 (2012) Survey Markers and Documentation
- EM 1110-1-1005 01 January 2007, Control and Topographic Surveying

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- NFPA 24 (2016) Installation of Private Fire Service Mains and Their Appurtenances

U.S. DEPARTMENT OF DEFENSE (DOD)
- UFC 3-201-01 (1 June 2013; Chg 1 - 3 Mar 2017) Civil Engineering
1.2 OMAHA DISTRICT CORPS OF ENGINEERS STANDARD DETAILS AND CADD CELLS.

The Omaha District's Civil and Environmental CADD standard details are available upon request after Contract award. See website identified in Section 01 33 00.32 DESIGN AND CONSTRUCTION DELIVERABLES/PROCEDURES. These standards and cells are available for the Contractor's use. References to using exact details and drawings are found in this section. In those cases, the Contractor shall use the referenced standard drawings and/or details.

1.3 GOVERNMENT-SUPPLIED ENGINEERING SURVEY

The Contractor shall use Government supplied survey data in the preparation of their proposal and design. An engineering field survey has been performed and data is available to the Contractor. The survey CADD files are in units of U.S. Survey Feet and AutoCAD 2013 format. The field survey data information was gathered by a topographical survey performed in February, 2016. Contours were gathered at 1-foot intervals. Below grade utility data was obtained from "best-available" record drawings. Government provided survey drawings are provided to assist the Contractor in preparing their proposal. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. During design and construction, the Contractor shall be responsible for obtaining any additional data necessary for the execution of this project.

1.3.1 Survey Monuments

The Contractor shall use existing government-supplied permanent surveying monuments for construction staking. Locations and descriptions of survey monuments can be found on government supplied survey cover sheet.

The Contractor shall provide copies of field notes for differential level loops from four horizontal control points within second order surveying tolerances. The Contractor shall immediately notify the Contracting
Government-supplied monuments shall be protected by the Contractor throughout the life of the project. Government-supplied monument disturbed by the Contractor shall be reset to second order surveying tolerances and subject to the Contracting Officer's approval at the Contractor's expense. Resetting of these monuments shall be in accordance with EM 1110-1-1002 and EM 1110-1-1005.

1.4 CONTRACTOR-SUPPLIED ENGINEERING SURVEY UPDATE

The Contractor shall update the Government-supplied engineering survey to include any changes that have occurred since the Government-supplied survey was completed (see Paragraph 1.3). The update shall include any changes within the site or project-related, off-site utility corridors. This survey update work shall be in accordance with the ODDG and EM 1110-1-1005. The updated survey shall be submitted to and approved by the Contracting Officer prior to commencement of grading and/or trenching activities.

1.4.1 Setting of Surveying Monuments

The Contractor shall set/provide Secondary Control as necessary to accomplish construction staking and as-built drawings for the project site and all project related, off-site utilities. Secondary Control shall be accomplished within second order surveying tolerances and shall be in accordance with EM 1110-1-1002.

1.4.2 Surveying of Underground Utilities

Within the project site and all project-related off-site utility corridors the Contractor shall expose all underground electrical, data, telecommunication, and natural gas pipelines, and conduits duct-banks. This is required in all areas of proposed excavation as well as utility crossings. Once exposed, the utilities shall be surveyed horizontally/vertically in accordance with the ODDG and EM 1110-1-1005. All utility systems including but not limited to storm drainage, sanitary sewer, water, etc. shall be exposed and surveyed where clearances are critical for new construction. The updated survey shall be submitted to and approved by the Contracting Officer prior to commencement of grading and/or trenching activities. Additional requirements are noted in paragraph 1.6.2.

1.4.3 As-Built Conditions

All new underground utility lines (including electrical power and communications, gas, water, sanitary sewer, storm drains, and culverts) shall be located by the Contractor during installation using surveying equipment. The Contractor shall survey pipe invert of gas, water, sanitary sewer, storm drains, and culverts and top of duct bank of electrical power and communications lines. Storm drains and sanitary sewer lines shall be surveyed where pipes enter manholes and inlets and at 100-foot maximum intervals along the line. The inverts of all cleanouts and tees shall be surveyed. Inverts at each end of culverts shall be surveyed. Electrical power, communications, gas and water lines shall be surveyed at all manholes, tees, valves, corners, changes in direction and at intervals along the line which will accurately depict the location of the line in both horizontal and vertical directions (50-foot maximum interval). Survey accuracy shall be in accordance with the ODDG and EM 1110-1-1005. Survey
shall be in the same coordinate system as government supplied survey.

1.5 CONTRACTOR'S STAGING AREA AND ACCESS ROUTE

1.5.1 Staging Area

The Contractor's staging area location is shown in the Drawings. The staging area shall be graded with a 4 percent maximum cross slope. The area shall have a 4 inch aggregate base material placed and compacted. Upon completion the staging area shall be cleared of all debris. The base material shall be removed from government property. The staging area shall be graded to drain, covered with 4 inches of topsoil and seeded.

1.5.2 Contractor's Access Route

The Contractor's access route to the project location is shown in the Drawings. Contractor's parking areas shall be located near the staging areas. The Contractor shall coordinate with Base Security if access to the site is modified based on FPCON level at the installation.

1.5.3 Contractor's Stockpile Area

Stockpile area, if required, will be determined during the Design/Build process. The stockpile shall be included in the NPDES permit. The site shall be leveled and seeded after operations are complete.

1.5.4 Project Sign

Contractor shall provide a project sign in accordance to Omaha District Standard Drawing PROJECT SIGN DETAILS.

1.6 DEMOLITION AND REMOVAL

The Contractor shall remove all pavements, utilities and other appurtenances necessary to construct the new facility. This project will include demolition of an existing firing range and appurtenant site features as indicated in the Drawings. Unless otherwise specified, disposal of all removed materials shall be outside the limits of Government-controlled lands in accordance with federal, state, and local regulations. The Contractor shall notify the Contracting Officer if any material to be disposed of is found to contain hazardous, toxic, biological or radiological substances. Rubbish and debris shall be removed from Government property daily to avoid accumulation at the project site.

1.6.1 Pavement Removals/Utility Protection

The Contractor shall avoid installing utilities underneath existing streets, sidewalks, and parking areas. The Contractor shall not install any utilities underneath buildings. In cases where it is necessary for the utilities to cross existing undisturbed streets, sidewalks, and parking lots, the Contractor shall install the lines using trenchless methods. No open trenching will be allowed unless written permission is obtained and approved by the Contracting Officer. Open trenching may be used beneath existing roads that are scheduled for removal, relocation or reconstruction. When open trench methods are approved, streets, sidewalks, and parking lots shall be sawcut, removed and replaced. Portions of walks and concrete pavements requiring removal shall be removed to the nearest joint.
1.6.2 Utility Interference

All existing utilities, including but not limited to storm drain, electrical power, sewer, gas, water, and communication lines that are impacted during the construction of this project shall remain in service. If this is not feasible, all outages shall be coordinated with the Contracting Officer. All underground utilities from field data and surveys, site investigations, and digging permit locates, shall be marked within and adjacent to areas of the work. All work areas shall be investigated with detection devices for cables and pipelines, to confirm locations, identify unknown utilities, and establish depths. All underground utilities potentially disturbed by the work and not specifically addressed in Surveying of Underground Utilities shall be located by hand digging or vacuum excavation prior to mechanical trenching or excavating in the vicinity. The Contracting Officer shall be notified of detection activities 48 hours in advance. Detection devices shall be on-site at all times.

1.7 NEW CONSTRUCTION

All new construction is located entirely within the limits of Government-controlled lands. The design drawings shall be developed using the same vertical and horizontal datum's as noted in Survey Monuments in this Section.

1.7.1 Buildings

Location and construction of the new Small Arms Range Complex including associated structures, roads, utilities and landscaping shall be as indicated on the drawings and as specified herein. However, the exact location may be revised slightly by the Contractor as needed to accommodate the final project layout. All site layout changes shall be subject to approval by the Government. The new building shall be handicap accessible. Government supplied site plans are provided to assist the Contractor in the preparation of their proposal and design. The site plans are available to the Contractor with this solicitation. Any errors identified shall be brought to the attention of the Contracting Officer immediately for resolution and direction. The Contractor shall take all professionally prudent and reasonable actions to verify the accuracy of the data provided. The Contractor shall be responsible for final site plans.

1.7.2 Parking

Provide an asphalt parking area with concrete curb and gutter for the number and and type of parking stalls indicated on the drawings. Parking stalls shall be 9 feet wide not including gutter width and 18 feet long. Driving aisles shall be a minimum of 26 feet wide. Handicap parking stalls, ramps and signage shall be provided and shall meet the requirements of 28 CFR Part 36. Parking stalls shall be delineated with 4-inch wide white stripes.

1.7.3 Service Drive

Construct a new asphalt service drive as indicated on the Drawings. Significant deviation from the alignment shown is subject to approval. An access control gate shall be provide where indicated on the Drawings. The gate shall consist of a lockable chain, removable bollards or similar.
1.7.4 Landscaping

1.7.4.1 Landscape Plan

Provide the final Landscape Plan as part of the design package. Comply with UFC 4-010-01, and as described below. Design the Landscape plan to conform with the Facilities Excellence Plan (FEP). Top dress all mulch beds with a 2 inch to 3 inch layer of shredded hardwood mulch. Provide commercial-quality black metal edging for mulch beds not edged by pavements. Weed barrier fabric is required below all mulch beds. Show extent of seeding proposed on final landscape plan.

1.7.5 Seeding

1.7.5.1 General

See the Facilities Excellence Plan (FEP) for seeding requirements and procedures.

1.7.6 Pipe Swing Gate

Provide pipe swing gates where indicated on the drawings.

1.7.7 Dumpster Pad Enclosure

Provide concrete pad and dumpster enclosure where noted on the drawings. Design enclosure to completely screen three sides of the dumpster pad and allow adequate space for two 8CY refuse containers. Allow additional space within the enclosure to facilitate pedestrian circulation and for pickup of refuse containers with a standard trash vehicle. Provide wheel stops on sides and rear of refuse containers to avoid damage to enclosure materials. Enclosures are required to be solid masonry with colors and finishes that are architecturally compatible with building materials. A minimum separation of 66 feet is required between buildings and the enclosure.

1.8 PAVEMENTS

1.8.1 Pavement Sections

The access roadway and parking lot in this project shall be constructed of flexible (asphalt cement) pavement over an appropriate base course. The typical cross section shown in the Drawings includes the required width of pavement, but the layer thicknesses shall be designed by the Contractor as described below. Permeable pavers may be used in the parking lot as a Low Impact Development (LID) Best Management Practice (BMP).

The Contractor shall be responsible for design of all pavements using the traffic information provided below. Design of pavement structures for roads and parking areas shall be determined by the Contractor using the methods described within UFC 3-250-01. Pavement design calculation sheets for the procedures may be found in UFC 3-250-01. The thickness of pavement layers may be designed using the Pavement- Transportation Computer Assisted Structural Engineering (PCASE) program in lieu of UFC 3-250-01. PCASE can be accessed at http://www.pcase.com.

Pavements for permanent installations shall be designed for a life of 25
years. Pavements at Buckley AFB shall be designed for seasonal frost conditions. Soil data for pavement design and a preliminary pavement section shall be obtained from the attached PRELIMINARY GEOTECHNICAL EVALUATION. Contractor shall DESIGN final pavement SECTION. The contractor is responsible for providing the Final Geotechnical Evaluation for the Project.

1.8.2 Design Traffic

Pavement for the roadway shall be rigid portland cement concrete and shall be designed for an Average Daily Traffic (ADT) of 100 vehicles (total vehicles for all lanes in both directions). The traffic composition consists of: 100 percent passenger cars, panel trucks and pickup trucks.

1.8.3 Sidewalks

Portland cement concrete sidewalks shall be a minimum of 4 inches thick over 4 inches of rigid pavement base course. Transverse contraction joint spacing shall be as follows; 4 feet for walks 4 feet and 8 feet wide, 5 feet for walks 5 feet and 10 feet wide, 6 feet for walks 6 feet and 12 feet wide. Longitudinal contraction joints shall be constructed in sidewalk widths 8 feet and greater. Expansion joint spacing shall not exceed 40 feet. Exterior P.C concrete walks shall be placed at the locations and widths as shown on the drawings. However, the exact location may be revised slightly by the Contractor as needed to accommodate the final project layout. All site layout changes shall be subject to approval by the Government. Walks accessing the handicap entrances shall meet the requirements of the American Disability Act with respect to width and grade.

1.8.4 Pavement Removal and Replacement for Utilities

Where new utilities will be installed across existing pavements using open trench method, existing pavement shall be removed and replaced to original thickness(unless otherwise noted). New bituminous and p.c. concrete pavement shall overlap at least 12 inches over existing base course.

1.8.5 Bituminous Prime Coat

A bituminous prime coat shall be applied to the surface of aggregate base course if it will be at least seven days before the hot-mix asphalt pavement layer is constructed on the underlying base course. If hot-mix asphalt pavement will be constructed within seven days of placement of underlying base course, a bituminous prime coat will not be required. Bituminous prime coat, if used, shall conform to Section 32 12 00 BITUMINOUS TACK AND PRIME COATS. Bituminous prime coat shall be: liquid asphalt conforming to the requirements of ASTM D2027/D2027M, designation MC-30 or MC-70, at the Contractor's option, except that only MC-30 shall be used on dense graded base courses if MC-70 does not adequately penetrate the base course material; cationic emulsified asphalt conforming to the requirements of ASTM D2397/D2397M, designation CSS-1 or CSS-1h, or emulsified asphalt conforming to the requirements of ASTM D977, designation SS-1 or SS-1h.

1.8.6 Bituminous Tack Coat

Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous material. Unless otherwise directed or required, bituminous material shall be cutback asphalt conforming to the requirements of ASTM D2028/D2028M, designation
RC-70 or RC-250; emulsified asphalt conforming to the requirements of ASTM D977, designation SS-1 or SS-1h; or cationic emulsified asphalt conforming to the requirements of ASTM D2397/D2397M, designation CSS-1 or CSS-1h.

1.8.7 Aggregate Base Course

Aggregate base course shall meet requirements of base course in the Colorado Department of Transportation Specifications for Roads and Bridges, latest edition. Aggregate base course should have a California Bearing Ratio (CBR) of at least 80. When an aggregate base course is used above a drainage layer, care must be taken to limit the material passing the No. 200 sieve in the base course to 8 percent or less in order to provide adequate drainage and to ensure that an excess of fines will not be available to wash into the drainage layer.

Disintegrated granite shall not be used for production of any aggregate and the processed aggregate shall contain not more than 2.0 percent by weight of disintegrated granite particles in that portion of the total sample larger than the 4.75 mm sieve and not more than 4.0 percent in any individual sieve size listed in the required aggregate gradation for that portion larger than the 4.75 mm sieve. A disintegrated granite particle is defined as a soft, crumbly particle of igneous rock having a visible crystalline grain size and consisting essentially of feldspar and quartz with lesser amounts of micas and/or amphiboles and pyroxenes. Generally, the rock particle will be stained by iron oxide and the feldspar grains will have a dull, highly fractured appearance. The individual mineral grains are so weakly bonded that the particle will crumble under moderate pressure. When tested by Test Method COE CRD-C 130 the particle would be classified as soft.

1.9 GRADING

1.9.1 General

Positive drainage shall be provided for all areas and existing drainage ways shall be utilized to the extent possible. It is desirable to direct drainage away from buildings to curb and gutter or road ditches. Swales between buildings and parking areas shall be avoided, if possible. Earthwork shall be balanced to the extent possible without compromising the design. The Contractor shall be responsible for editing the specifications for the project. The Contractor shall be responsible for final grading plans.

1.9.2 Adjustment of Existing Structures

All manholes, valve boxes, or inlets of any nature within the project that do not conform to the new finish grade in either surfaced or unsurfaced areas shall be adjusted to the new finish grade. Where inlets, manholes, or valve boxes fall within a surfaced or unpaved roadway or parking, the existing frames and cover shall be removed and replaced with a heavy-duty frame and cover. The structure shall be adjusted as needed to fit the new conditions. All structures shall be of a type suitable for the intended use and shall conform to the requirements of the applicable section of these specifications.

1.9.3 Borrow and Waste

Borrow materials, if needed, shall be obtained from sources outside of
government property. Excess soil shall be removed from government property.

1.9.4 Sidewalks

Concrete walks shall have a transverse grade of 2 percent. Maximum longitudinal walk grade shall be 5 percent in freezing climates. Walks designed to provide a handicap accessible route shall conform to 28 CFR Part 36 ADA Standards for Accessible Design.

1.9.5 Parking Lot Grades

a. Desirable minimum transverse parking area grade of 2 percent. Absolute minimum grade of 1.5 percent for flexible pavement and 1 percent for rigid pavement.

b. Maximum desirable parking area grade of 4 percent.

1.9.6 Ramp Grades

a. Desirable maximum of 7 percent.

b. Absolute maximum of 8.33 percent for short distances only.

1.9.7 Gutter Grades

a. Desirable minimum of 0.8 percent.

b. Absolute minimum of 0.5 percent.

1.9.8 Building Floor Elevation

Building finished floor elevation shall be set to ensure that the required minimum and maximum grades are met. Buildings shall not be constructed within a 100-year floodway. First floor of new buildings shall be constructed a minimum of 1 foot above the 100-year flood plain elevation.

1.9.9 Grades Away From Building

a. Minimum of 5 percent for 10 feet in unpaved areas.

b. Maximum of 10 percent for 10 feet.

1.9.10 Overlot Grades

a. Minimum 1 percent for cohesionless sandy soils.

b. Minimum 2 percent for cohesive soils or turfed areas.

c. Sideslopes for ditches, roads, and other turfed areas shall be no steeper than 1V on 3H.

1.9.11 Ditches

Ditches shall be graded at non-erodible slopes or the ditch shall be lined with an appropriate material to prevent erosion. A design storm with a return period of at least 2 years shall be used to determine erodibility of ditches and swales. The depth of ditches along pavement shoulders shall be such that the water surface from the 10 year design storm is below pavement subbase and base courses which daylight through the adjacent shoulder.
1.10 STORM DRAINAGE

1.10.1 Determination of Storm Runoff

Determination of peak discharges for smaller drainage areas shall be accomplished using either the Rational Method, or the modified Rational Method presented in UFC 3-201-01. The Rational Method may not be used for drainage areas more than 200 acres. The minimum time of concentration for turfed or paved areas shall be 5 minutes. For larger areas or where detailed consideration of ponding is required, computation should be by unit-hydrograph and flow-routing procedures such as HEC-HMS.

1.10.1.1 Design Storm Return Period

Storm drains shall be sized for a design storm with a return period of 10 years. Culverts shall be sized for a design storm with a return period of 25 years. Provisions shall be made to protect all buildings and critical structures from a major storm event with a return period of 100 years.

1.10.1.2 Rainfall Intensity-Duration-Frequency Data

Rainfall intensity-duration data developed by the City of Denver shall be used.

1.10.2 Stormwater Management

Contractor shall develop a stormwater management plan in accordance with requirements detailed in UFC 3-210-10.

If the final post-development footprint of new surfaces (sidewalks, buildings, non-vegetated landscaping, etc.) exceeds 5000 square feet, Post-Development storm water controls must be implemented that return the developed area to pre-development hydrology to the maximum extent technically feasible. This is a requirement of Section 438 of the Energy Independence and Security Act (EISA). In accordance with DOD memo, “DOD Policy on Implementing Section 438 of the Energy Independence and Security Act (EISA)” dated January 10, 2010; the difference in discharge between the natural condition and the proposed impacted condition will be the minimal target amount that will be required to be mitigated through permanent Low Impact Development (LID) Best Management Practice (BMP) design. The LID BMP design is required to address storms with a five-year return period and account for the pre-development temperature, discharge rate, volume, and duration of flow. Construct the BMP design to mitigate the change in flow and volume while passing the 25-year native flow characteristics downstream. The BMP must not hold standing water for greater than 72 hours.

1.10.3 Storm Drainage System Design

The Contractor shall be responsible for design of the storm drainage system. The storm drainage system shall be designed so as to minimize the number of drainage structures required. Structures shall be located at all changes in direction of storm drain line, at the intersection of two or more storm drain lines, and where required to intercept rainfall runoff. The maximum distance between drainage structures shall be approximately 300 feet for conduits less than 30 inches in diameter. The maximum distance between drainage structures shall be approximately 500 feet for conduits 30 inches and greater in diameter. Storm runoff in streets with curbing shall be collected using curb inlets or area inlets. Drainage of runoff from
turfed areas onto pavements shall be minimized. Where possible, a minimum drop of 0.2 feet between inverts of equal diameter storm drain pipes shall be provided at the centerline of drainage structures. Where storm drain pipes are of different diameters, the pipe crown elevations should be matched at the drainage structure. Storm drain pipes shall have a minimum diameter of 12 inches. Storm drain lines shall be located outside of paved areas to the extent possible. Under no circumstance shall storm drain lines be located beneath buildings. The roof drain system shall have outlet(s) to an appropriate stormwater mitigation feature (BMP), determined by the Contractor. An approximate location for this LID feature should be to the north of the parking lot and building or placed underneath the proposed parking lot.

1.10.3.1 Hydraulic Design

New storm drain pipes shall be designed for gravity flow during the 10-year design storm unless otherwise approved by the Government. The hydraulic grade line shall be calculated for the storm drain system and all energy losses accounted for. Storm drain systems shall be designed to provide a minimum flow velocity of 2.5 feet per second when the drains are one-third or more full.

1.10.3.2 Manholes

Diameter of manholes shall be large enough to accommodate pipes entering/exiting the manhole. Manhole cast iron frames shall have a minimum opening diameter of 30 inches. Galvanized steel ladders shall be provided in all manholes with a depth exceeding 6 feet.

1.10.3.3 Area Inlets

Area inlets shall be properly sized and designed to accommodate the design flows.

1.10.3.4 Headwalls and Flared End Sections

Unless otherwise approved, headwalls or flared end sections shall be provided at the ends of culverts and at storm drain outfalls. Protection from erosion and scouring at headwall and flared end section outfalls shall be provided as needed.

1.10.3.5 Culverts

Culvert pipes shall have a minimum diameter of 18 inches.

1.10.4 Storm Drain and Culvert Pipe

The Contractor shall select the appropriate storm drain and culvert pipe. Only pipe materials which have a minimum design service life of 50 years shall be allowed for permanent installations. As a minimum, all pipe joints shall be soiltight. The Contractor shall specify watertight pipe joints and flexible resilient pipe connectors at drainage structures when the water table is at or above the pipeline.

1.10.4.1 Concrete Pipe

Reinforced concrete pipe shall be a minimum Class III. Type I cement may be used only when sulfates in the soil are 0.1 percent or less and dissolved sulfates in the effluent are 150 ppm or less. Type II cement may
be used only when sulfates in the soil are 0.2 percent or less and dissolved sulfates in the effluent are 1,500 ppm or less. Only Type V cement may be used if sulfates in the soil exceed 0.2 percent or dissolved sulfates in the effluent exceed 1,500 ppm. Concrete pipe shall be assumed to have a minimum design service life of 50 years unless the Contractor determines that conditions at the site will reduce the service life. Concrete culverts and storm drains shall be protected by a minimum of 3 feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction.

1.10.4.2 Plastic Pipe

Stiffness of the plastic pipe and soil envelope shall be such that the predicted long-term deflection shall not exceed 7.5 percent. Plastic culverts and storm drains shall be protected by a minimum of 3 feet of cover during construction to prevent damage before permitting heavy construction equipment to pass over them during construction. Split couplers shall not be allowed for corrugated high-density polyethylene pipe. Plastic pipe shall be assumed to have a minimum design service life of 50 years unless the Contractor determines that conditions at the site will reduce the service life. The final depth of cover for plastic pipe shall be a minimum of 2 feet and a maximum of 15 feet.

1.11 TRAFFIC SIGNAGE AND STRIPING

Traffic signage and striping shall be provided for all new roads. Signage and striping shall be designed in accordance with MUTCD Manual on Uniform Traffic Control Devices for Streets and Highways. Roads and streets shall be striped with reflectorized paint.

1.12 EROSION AND SEDIMENT CONTROL

The Contractor shall be responsible for selecting and implementing Best Management Practices (BMPs) to minimize pollutants in storm water discharges associated with construction activity at the construction site. All erosion and sediment measures and other protective measures shall be maintained by the Contractor in effective operating condition. All temporary structural practices shall be removed once the corresponding disturbed drainage area has been permanently stabilized. The Contractor shall comply with the requirements in Omaha District guide specification.

1.12.1 Temporary Construction Entrance

Tracking of mud from the construction site onto adjacent roads and streets shall be kept to a minimum. A temporary stabilized stone pad shall be constructed at points where vehicular traffic will be leaving the construction site and moving directly onto a paved road or street. It shall extend the full width of the vehicular ingress and egress area and have a minimum length of 70 feet. The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto adjacent roads or streets. If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the stone, then the tires of the vehicles shall be washed before entering the road or street. Any mud which is tracked onto roads or streets shall be removed at least once daily.

1.12.2 Erosion Control Blanket

Bottoms and sideslopes of ditches and any other disturbed slopes 1V on 4H or steeper shall be covered with an erosion control blanket immediately.
after seeding.

1.12.3 Silt Fence

Silt fencing shall be installed below disturbed areas where erosion would occur in the form of sheet and rill erosion. The size of the drainage area above the silt fence shall not exceed one fourth of an acre per 100 feet of silt fence length. Silt fencing may be installed across ditches only when the maximum contributing drainage area is not greater than 1 acre. Silt fence constructed across a ditch shall have wire support and shall be of sufficient length to eliminate endflow.

1.12.4 Straw Bale Barrier

Straw bale barriers may not be installed across ditches.

1.12.5 Outlet Protection

Preformed riprap lined scour holes or other suitable measures shall be installed at outlets of culverts and storm drains as needed to prevent erosion.

1.12.6 Storm Drain Inlet Protection

Storm drain inlet protection shall be installed around any new or existing storm drain inlets that will become operational before permanent stabilization of the corresponding disturbed drainage area has occurred. Storm inlet protection shall be designed so no reduction of flow occurs. The use of drop in BMPs are recommended.

1.12.7 Rock Check Dam

Rock check dams may be installed in ditches which drain 2 to 10 acres. The allowable drainage area will be dependent on the gradation of the rock used to construct the check dam. The maximum height of the dam shall be 3 feet. The center of the dam shall be at least 6 inches lower than the outer edges. For added stability, the base of the check dam may be keyed into the soil approximately 6 inches. The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.

1.12.8 Temporary Sediment Trap

Temporary sediment traps may be constructed below disturbed areas where the total drainage area is less than 3 acres.

1.12.9 Temporary Sediment Basin

Temporary sediment basins may be constructed below disturbed areas where the total drainage area is equal to or greater than 3 acres.

1.12.10 Other Controls

Other controls such as diversion dikes, level spreaders, temporary seeding, etc. may be used if deemed necessary by the Contractor. The Contracting Officer may require the contractor to install additional controls if the current erosion control devices are not working adequately.
1.13 UTILITIES

The Contractor shall avoid running utilities underneath buildings, streets, and parking lots. In cases where it is necessary for the utilities to cross existing streets, the Contractor shall install the lines by boring and jacking methods. No open trenching will be allowed through existing streets unless written permission is obtained and approved by the Contracting Officer.

1.13.1 CATHODIC PROTECTION

Corrosion protection shall be provided for all buried gray or ductile-iron piping, coated piping, fittings, valves, and other water line appurtenances, regardless of pipe material. Corrosion protection shall consist of an anode type cathodic protection system. See Section 01 86 26 ELECTRICAL REQUIREMENTS.

1.13.2 WATERLINES

a. All waterlines shall comply with applicable Local, State and Federal standards. Local and State standards shall dictate unless the Federal standards are more stringent. Water distribution systems and service lines shall be designed and constructed in accordance with UFC 3-230-01 and applicable State criteria and applicable UFGS guide specifications. Where there is a conflict between UFC 3-230-01 and the State criteria, the State criteria shall be followed. The Contractor shall be responsible for protection of existing waterlines. If any potable waterlines are damaged during construction, the Contractor must immediately notify the Contracting Officer. The Contractor shall disinfect all new water lines and any remaining lines which do not remain fully pressurized during construction or connection. The Contractor shall notify the Contracting Officer prior to disinfection of the water lines. The disinfection shall be in accordance with the American Water Works Association Standard AWWA C651 and shall not be considered complete until two consecutive days of bacteriological samples show no contamination. All bacteriological, lead and copper tests shall be performed by Environmental Protections Agency (EPA) certified laboratories. Copies of results of the analyses shall be forwarded to the Contractor upon receipt.

b. The Contractor shall design and provide all facilities required to deliver water to the project. Service connections or extensions to the existing water distribution system shall be made without interruption to service. The domestic demand for the new facility served shall be designed in accordance with the Uniform Plumbing Code Fixture Count Method. For design of the waterlines, use maximum Hazen-Williams "C" value of 130 for plastic pipe and 120 for other pipe materials. The building's domestic and fire services shall connect to the water main in the Base's high pressure zone northeast of the building.

Water lines shall be installed with a minimum of five feet of cover below finished grade. Dedicated fire service lines shall be provided with an additional six inches of cover. Fire service lines and service mains shall be provided with the maximum velocity in pipe to be 10 fps. Provide surge suppression pressure calculations of plastic pipe and submit for review.

1.13.2.1 Water Distribution and Service Lines

a. Flow Requirements
Water shall be supplied by service lines of appropriate capacity to provide the flows determined to be necessary to meet all requirements of the new facility. The requirements include all domestic use, and interior and exterior fire protection water as required. Contractor shall submit all design calculations of the water design.

b. Service Connections

A maximum velocity of 10 feet per second shall be used for metallic piping and 10 feet per second shall be used for nonmetallic piping. Provide surge suppression pressure calculations of plastic pipe and submit for review. If the Service connection is one pipe size or more less than the pipe being connected to, the service connection shall be made via tapping sleeves and valves. If the service connection is the same size as the pipe being connected to, the service connection shall be made by cutting a tee into the existing pipe. Coordinate connection with Contracting Officer.

c. Dewatering, Hydrostatic Testing, and Flushing of Lines

The Contractor shall be responsible for implementing the terms and requirements for dewatering, hydrostatic testing, and flushing of lines after disinfection.

d. Domestic Service Stop Valve

Building shall be provided with separate service and stop valves in areas readily accessible to maintenance and emergency personnel. Stop valves located in walks are prohibited.

1.13.2.2 Dedicated Fire Water Service Lines

a. Fire Flow Data

For determination and documentation of fire protection, the Contractor shall conduct and provide all fire hydrant flow tests. Flow tests shall be performed in the project site within seven (7) days of the installation of the fire hydrants. Data to be included with the flow tests are static pressures, residual pressures, flowrates, date, domestic and fire pumps in operation at the pumphouse, time tests were conducted, and name of personnel conducting the fire hydrant flow tests. The static pressures, residual pressures, flowrates, test hydrant and flow hydrants shall be shown on the appropriate contract drawings. Fire hydrant flow tests required for fire protection design shall be made in accordance with the procedures specified in NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants. The Contractor shall coordinate with the Contracting Officer prior to conducting such tests. The Contractor shall submit fire hydrant flow test data with the design calculations. The Contractor shall become familiar with the existing water system prior to conducting the hydrant flow tests.

The following hydrant flow tests were conducted on August 9, 2016, and August 10, 2016. The first test hydrant was on the southeast corner of Building 1301. The flow hydrants were located northwest and southwest of Building 1301. The hydrant flow test results are provided for bidding purposes only.

Static pressure: 84 psi
Residual pressure: 50 psi
Residual flow: 1,270 gpm
The second test hydrant was located on the north side of Building 1207. The flow hydrants were located on the northwest and west side of building 1207. The hydrant flow test results are provided for bidding purposes only.

Static pressure: 61 psi
Residual pressure: 18 psi
Residual flow: 1,310 gpm

Hydrant flow test results and locations are provided as an attachment to this section.

The contractor is required to perform a hydrant flow test for design purposes.

b. Fire Hydrants

The Contractor shall be required to install fire hydrants for the new facility. One fire hydrant shall be located within a minimum of 150 feet of the building fire department connection. All other hydrants shall be located in accordance with UFC 3-600-01 and NFPA 1, chapter 18. The hydrant shall have connections identical to the existing hydrants at the Base. The hydrant shall be painted to match the Base's color scheme.

c. Dedicated Fire Line

The Contractor shall be required to provide a separate fire water service line to the building for interior fire sprinkler protection in accordance with NFPA 24, 2013, and UFC 3-600-01. The fire water service line to the building shall be equipped with a Post Indicator Valve (PIV) that can be readily located by the fire department. The PIV shall not be placed closer than 60 feet to the building it is serving and shall be provided with a tamper switch connected to the building fire control panel. The PIV shall be protected by 6 inch steel pipe bollards, filled with concrete, painted and spaced in accordance with the installation requirements. The PIV shall be painted to match the Base's color scheme.

1.13.3 WASTEWATER

All wastewater lines shall comply with applicable Local, State, and Federal standards.

1.13.3.1 Design Criteria

Sewage system shall be designed and constructed in accordance with State and local criteria unless the Federal standards are more stringent. If the Federal standards are more stringent, the sewage system shall be designed and constructed in accordance with UFC 3-240-01, UFC 3-240-02 and applicable UFGS guide specifications. There is no existing gravity sanitary sewage system near this site. There are two existing sanitary force mains in the area, however, both are flowing a full capacity and no taps are allowed on these forcemains. This building will require a septic tank and absorption beds. Design of the septic tank and absorption beds shall be in accordance with Tri-County Health Department Regulation No. 0-14 "On-Site Wastewater Treatment Systems" and the Colorado Department of Public Health and Environment Water Quality Control Commission On-Site Wastewater Treatment System Regulation #43, 5 CCR-1002-43. The exterior sanitary service line discharging to the septic tank shall be minimum of 6 inch diameter pipe. All design slopes will be calculated using the Manning
formula. The Contractor shall provide all calculations.

1.13.3.2 Manholes

Manholes are required at all changes of direction, slope, and size for pipes 6 inches diameter or greater. Manholes shall be spaced not more than 400 feet apart. Manholes shall be located at intersections of streets when possible. Avoid placing manholes where the tops will be submerged or subject to surface water inflow. Where the invert of the inlet pipe would be more than 1.5 feet above the manhole floor, a drop connection will be provided. The Contractor shall provide all calculations. Manholes 6 feet deep or greater shall be provided with a ladder.

1.13.3.3 Cleanouts

Cleanouts are required at all changes of direction, and slopes for pipe 6 inches diameter or smaller. Cleanouts shall be spaced not more than 90 feet apart.

1.13.4 Gas Distribution System

See Section 01 86 10 MECHANICAL REQUIREMENTS for instructions and engineering information relating to the design of the exterior gas distribution system.

1.13.5 Electrical Distribution System

See Section 01 86 26 ELECTRICAL REQUIREMENTS for instructions and engineering information relating to the design of the exterior electrical distribution system.

1.13.6 Communications Systems

Refer to Section 01 86 29 COMMUNICATIONS REQUIREMENTS for exterior communications requirements.

1.14 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

1.14.1 Trenches

Jacking and boring shall be required when an underground utility line crosses any roadway. Sewer and water lines, mains or laterals, shall be placed in separate trenches. The separate trenches shall maintain a minimum horizontal separation of 10 feet and the bottom of the water line shall be at least 1.5 feet above the top of the sewer. Sewers crossing above potable water lines shall maintain a vertical separation of 1.5 feet and must be constructed of suitable pressure pipe or fully encased in concrete for a distance of 10 feet on each side of the crossing.

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Bedding and initial backfill material shall be in accordance with the manufacturers recommendations. Where no manufacturer's installation manual is available, trench walls shall be excavated to a stable angle of repose as required to properly complete the work. Trench excavations shall adhere to requirements prescribed in EM 385-1-1, Safety and Health Requirements Manual. Special attention shall be given to slopes which may be adversely affected by weather or moisture content.
1.14.2 Conductor Wire

All non-metallic utility and storm drain lines shall have #12 AWG TW (thermal-weather resistant) coated conductor installed parallel with and 6 inches above the utility for the reception of a locator transmitter signal.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --
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-- End of Section Table of Contents --
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The existing facility scheduled for demolition dates from the 1980s. See Hazardous Materials Survey Report (to be provided) for information regarding asbestos-containing materials in the facility being demolished. Any asbestos-containing materials that require removal prior to demolition shall be handled in accordance with this section. The Contractor shall be responsible for verification of all existing conditions prior to demolition.

1.1   PAYMENT PROCEDURES
Submit copies of weight bills and delivery tickets for payment to the Contracting Officer during the progress of the work. Furnish scale tickets for each load of ACM weighed and certified. These tickets shall include tare weight; identification mark for each vehicle weighed; and date, time and location of loading and unloading. Tickets shall be furnished at the point and time individual trucks arrive at the worksite. A master log of all vehicle loading shall be furnished for each day of loading operations. Before the final statement is allowed, file with the Contracting Officer certified weigh bills and/or certified tickets and manifests of all ACM actually disposed by the Contractor for this contract.

1.2   REFERENCES
The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)


ASTM INTERNATIONAL (ASTM)


COMPRESSED GAS ASSOCIATION (CGA)


INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z87.1  (2015) Occupational and Educational Personal Eye and Face Protection Devices
1.3 DEFINITIONS

1.3.1 Amended Water

Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter.

1.3.2 Asbestos-Containing Material (ACM)

Any materials containing more than one percent asbestos.

1.3.3 Authorized Person

Any person authorized by the Contractor and required by work duties to be present in the regulated areas.

1.3.4 Building Inspector

Individual who inspects buildings for asbestos and has EPA Model Accreditation Plan (MAP) "Building Inspector" training; accreditation required by 40 CFR 763, Subpart E, Appendix C, has EPA/State certification/license as a "Building Inspector".

1.3.5 Class I Asbestos Work

Activities defined by OSHA involving the removal of thermal system insulation (TSI) and surfacing ACM.

1.3.6 Class II Asbestos Work

Activities defined by OSHA involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Certain "incidental" roofing materials such as mastic, flashing and cements when they are still intact are excluded from Class II asbestos work. Removal of small amounts of these materials which would fit into a glovebag may be classified as a Class III job.

1.3.7 Class III Asbestos Work

Activities defined by OSHA that involve repair and maintenance operations, where ACM, including TSI and surfacing ACM, is likely to be disturbed. Operations may include drilling, abrading, cutting a hole, cable pulling, crawling through tunnels or attics and spaces above the ceiling, where asbestos is actively disturbed or asbestos-containing debris is actively disturbed.

1.3.8 Class IV Asbestos Work

Maintenance and custodial construction activities during which employees contact but do not disturb ACM and activities to clean-up dust, waste and debris resulting from Class I, II, and III activities. This may include dusting surfaces where ACM waste and debris and accompanying dust exists and cleaning up loose ACM debris from TSI or surfacing ACM following construction.
1.3.9  Clean Room

An uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

1.3.10  Competent Person

In addition to the definition in 29 CFR 1926.32(f), a person who is capable of identifying existing asbestos hazards as defined in 29 CFR 1926.1101, selecting the appropriate control strategy, has the authority to take prompt corrective measures to eliminate them and has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training; has EPA/State certification/license as a "Contractor/Supervisor".

1.3.11  Contractor/Supervisor

Individual who supervises asbestos abatement work and has EPA Model Accreditation Plan "Contractor/Supervisor" training; has EPA/State certification as a "Contractor/Supervisor".

1.3.12  Critical Barrier

One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area from migrating to an adjacent area.

1.3.13  Decontamination Area

An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

1.3.14  Demolition

The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

1.3.15  Disposal Bag

A 6 mil thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926.1101, used for transporting asbestos waste from containment to disposal site.

1.3.16  Disturbance

Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM. Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in 1 standard sized glovebag or waste bag, not larger than 60 inches in length and width in order to access a building component.

1.3.17  Equipment Room or Area

An area adjacent to the regulated area used for the decontamination of employees and their equipment.
1.3.18 Fiber

A fibrous particulate, 5 micrometers or longer, with a length to width ratio of at least 3 to 1.

1.3.19 Friable ACM

A term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material which contains more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Polarized Light Microscopy (PLM), that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

1.3.20 Glovebag

Not more than a 60 by 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

1.3.21 High-Efficiency Particulate Air (HEPA) Filter

A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

1.3.22 Intact

ACM which has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of "intact" asphalitic, resinous, cementitious products does not render the ACM non-intact simply by being separated into smaller pieces.

1.3.23 Model Accreditation Plan (MAP)

USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763.

1.3.24 Negative Initial Exposure Assessment

A demonstration by the Contractor to show that employee exposure during an operation is expected to be consistently below the OSHA Permissible Exposure Limits (PELs).

1.3.25 NESHAP

National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61, Subpart M.

1.3.26 Nonfriable ACM

A NESHAP term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material containing more than 1 percent asbestos that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

1.3.27 Nonfriable ACM (Category I)

A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos.
1.3.28 Nonfriable ACM (Category II)

A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos.

1.3.29 Permissible Exposure Limits (PELs)

1.3.29.1 PEL-Time Weighted Average (TWA)

Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8 hour time weighted average (TWA).

1.3.29.2 PEL-Excursion Limit

An airborne concentration of asbestos not in excess of 1.0 f/cc of air as averaged over a sampling period of 30 minutes.

1.3.30 Regulated Area

An OSHA term defined in 29 CFR 1926.1101 meaning an area established by the Contractor to demarcate areas where Class I, II, and III asbestos work is conducted; also any adjoining area where debris and waste from such asbestos work accumulate; and an area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.

1.3.31 Removal

All operations where ACM is taken out or stripped from structures or substrates, and includes demolition operations.

1.3.32 Repair

Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM attached to structures or substrates.

1.3.33 Surfacing ACM

Asbestos-containing material which contains more than 1 percent asbestos and is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

1.3.34 Thermal System Insulation (TSI) ACM

ACM which contains more than 1 percent asbestos and is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain or water condensation.

1.3.35 Transite

A generic name for asbestos cement wallboard and pipe.

1.3.36 Worker

Individual (not designated as the Competent Person or a supervisor) who
performs asbestos work and has completed asbestos worker training required by 29 CFR 1926.1101, to include EPA Model Accreditation Plan (MAP) "Worker" training; accreditation if required by the OSHA Class of work to be performed or by the state where the work is to be performed.

1.4 SYSTEM DESCRIPTION

This section covers all operations in which asbestos-containing materials (ACM) are encountered. These procedures and equipment are required to protect workers and building occupants from airborne asbestos fibers and ACM dust and debris. Activities may include OSHA Class I and/or Class II work operations. This section also includes containment, storage, transportation and disposal of the generated ACM wastes. Submit site layout to include worksite containment area(s), local exhaust systems locations, decontamination units and load-out units, other temporary waste storage facility, access tunnels, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area.

1.4.1 Abatement Work Tasks

Review the attached hazardous materials survey report to determine ACM that is located in the building. Provide additional sampling as needed to identify additional asbestos-containing materials. Remove friable ACM and ACM that will become friable during demolition tasks.

1.4.2 Unexpected Discovery of Asbestos

For any previously untested building components suspected to contain asbestos and located in areas impacted by the work, notify the Contracting Officer (CO) who will have the option of ordering up to 6 bulk samples to be obtained at the Contractor's expense and delivered to a laboratory accredited under the National Institute of Standards and Technology (NIST) "National Voluntary Laboratory Accreditation Program (NVLAP)" and analyzed by PLM. If the asbestos content is less than 10 percent, as determined by a method other than point counting, the asbestos content shall be verified by point counting. Any additional components identified as ACM that have been approved by the CO for removal shall be removed and will be paid for by an equitable adjustment to the contract price under the CONTRACT CLAUSE titled "changes". Sampling shall be conducted by personnel who have successfully completed the EPA Model Accreditation Plan (MAP) "Building Inspector" training course and is EPA/State certified/licensed as a "Building Inspector".

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Asbestos Waste Shipment Records; G, RO
Weight Bills and Delivery Tickets

Respiratory Protection Program; G, RO
Cleanup and Disposal; G, RO
Qualifications; G, RO
Training Program

Licenses, Permits and Notifications

SD-06 Test Reports

Exposure Assessment and Air Monitoring
Local Exhaust System

SD-07 Certificates

Local Exhaust System

Medical Surveillance Requirements

1.6 QUALITY ASSURANCE

In addition to detailed requirements of this specification, work performed under this contract shall comply with EM 385-1-1, applicable federal, state, and local laws, ordinances, criteria, rules and regulations regarding handling, storing, transporting, and disposing of asbestos waste materials. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply. The following state and local laws, rules and regulations apply: 5 CCR 1001-10 Colorado Air Quality Control Commission Emission Standards for Asbestos and CRS 25-7-5 Health, Air Quality Control, Asbestos Control.

1.6.1 Written Qualifications and Organization Report

Submit a written qualifications and organization report providing evidence of qualifications of the Contractor, Contractor's Project Supervisor, Designated Competent Person, supervisors and workers; Designated IH; independent testing laboratory; all subcontractors to be used including disposal transportation and disposal facility firms, subcontractor supervisors, subcontractor workers; and any others assigned to perform asbestos abatement and support activities. Include in the report an organization chart showing the Contractor's staff organization chain of command and reporting relationship with all subcontractors. The report shall be signed by the Contractor, the Contractor's onsite project manager, Designated Competent Person, Designated IH, designated testing laboratory and the principals of all subcontractors to be used. Include the following
statement in the report: "By signing this report I certify that the personnel I am responsible for during the course of this project fully understand the contents of 29 CFR 1926.1101, 40 CFR 61, Subpart M, and the federal, state and local requirements for those asbestos abatement activities that they will be involved in."

1.6.2 Specific Requirements

Designate in writing, personnel meeting the following qualifications:

a. Asbestos Abatement Contractor: Certified/licensed [by applicable state agencies] to perform asbestos-related activities.

b. Designated Competent Person: Qualified in accordance with 29 CFR 1926.32 and 29 CFR 1926.1101, has EPA MAP "Contractor/Supervisor" training accreditation, has EPA/State certification/license as a "Contractor/Supervisor" and is experienced in the administration and supervision of asbestos abatement projects. The Designated Competent Person shall be responsible for compliance with applicable federal, state and local requirements, the Contractor's Accident Prevention Plan (APP) and Asbestos Hazard Abatement Plan (AHAP). Submit the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training, EPA/State certification/license with the employee "Certificate of Worker Acknowledgment". Submit evidence that this person has a minimum of 2 years of on-the-job asbestos abatement experience relevant to OSHA competent person requirements. The Designated Competent Person shall be onsite at all times during the conduct of this project.

c. Project and Other Supervisors: Have EPA MAP "Contractor/Supervisor" training accreditation. Submit the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training, EPA/State certification/license with the employee "Certificate of Worker Acknowledgment". Also submit evidence that the Project Supervisor has a minimum of 2 years of on-the-job asbestos abatement experience relevant to project supervisor responsibilities and the other supervisors have a minimum of 1 year on-the-job asbestos abatement experience commensurate with the responsibilities they will have on this project.

d. Designated Industrial Hygienist: Resume for the Industrial Hygienist (IH) selected to prepare the Contractor's AHAP, prepare and perform training, direct air monitoring and assist the Contractor's Competent Person in implementing and ensuring that safety and health requirements are complied with during the performance of all required work. The Designated IH shall be a person who is board certified in the practice of industrial hygiene as determined and documented by the American Board of Industrial Hygiene (ABIH), has EPA MAP "Contractor/Supervisor" training accreditation, has EPA/State certification/license, and has a minimum of 2 years of comprehensive experience in planning and overseeing asbestos abatement activities. Submit the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training and EPA/State certification/license with the employee "Certificate of Worker Acknowledgment". The Designated IH shall be completely independent from the Contractor according to federal, state, or local regulations; that is, shall not be a Contractor's employee or be an employee or principal of a firm in a business relationship with the Contractor negating such independent status. A copy of the Designated IH's...
current valid ABIH certification shall be included. The Designated IH shall visit the site as needed for the duration of asbestos activities and shall be available for emergencies. In addition, submit resumes of additional IH's and industrial hygiene technicians (IHT) who will be assisting the Designated IH in performing onsite tasks. IHs and IHTs supporting the Designated IH shall have a minimum of 2 years of practical onsite asbestos abatement experience. Indicate the formal reporting relationship between the Designated IH and the support IHs and IHTs, the Designated Competent Person, and the Contractor.

e. Asbestos Abatement Workers: Meet the requirements contained in 29 CFR 1926.1101, 40 CFR 61, Subpart M, and other applicable federal, state and local requirements. Worker training documentation shall be provided as required on the "Certificate of Workers Acknowledgment". Training documentation is required for each employee who will perform OSHA Class I or Class II asbestos abatement operations. Such documentation shall be submitted on a Contractor generated form titled "Certificate of Workers Acknowledgment", to be completed for each employee in the same format and containing the same information as the example certificate at the end of this section. Training course completion certificates (initial and most recent update refresher) required by the information checked on the form shall be attached.

f. Physician: Resume of the physician who will or has performed the medical examinations and evaluations of the persons who will conduct the asbestos abatement work tasks. The physician shall be currently licensed by the state where the workers will be or have been examined, have expertise in pneumoconiosis and shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1926.1101. The physician shall be familiar with the site's hazards and the scope of this project.

g. Independent Testing Laboratory: identify the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification of the following criteria, signed by the testing laboratory principal and the Contractor, shall be submitted:

   (1) Phase contrast microscopy (PCM): The laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926.1101, OSHA method ID-160, the most current version of NIOSH NMAM Method 7400 as shown in Table 3 at the end of this Section. The laboratory shall be currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program or by participating in the AIHA PAT Program, and being judged proficient in counting samples.

   (2) Polarized light microscopy (PLM): The laboratory is fully equipped and proficient in conducting PLM analyses of suspect ACM bulk samples in accordance with 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for bulk asbestos analysis and will use analysts with demonstrated proficiency to conduct PLM analyses.
h. Disposal Facility, Transporter: Written evidence that the landfill to be used is approved for asbestos disposal by the USEPA and state and local regulatory agencies. Copies of signed agreements between the Contractor (including subcontractors and transporters) and the asbestos waste disposal facility to accept and dispose of all asbestos containing waste shall be provided. The Contractor and transporters shall meet the DOT requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as registration requirements of 49 CFR 107 and other applicable state or local requirements. The disposal facility shall meet the requirements of 40 CFR 61, Sections .154 or .155, as required in 40 CFR 61 150(b), and other applicable state or local requirements.

1.6.3 Federal, State or Local Citations on Previous Projects

The Contractor and all subcontractors shall submit a statement, signed by an officer of the company, containing a record of any citations issued by Federal, State or local regulatory agencies relating to asbestos activities (including projects, dates, and resolutions); a list of penalties incurred through non-compliance with asbestos project specifications, including liquidated damages, overruns in scheduled time limitations and resolutions; and situations in which an asbestos-related contract has been terminated (including projects, dates, and reasons for terminations). If there are none, a negative declaration signed by an officer of the company shall be provided.

1.6.4 Preconstruction Conference

The Contractor and the Contractor's Designated Competent Person, Project Supervisor, and Designated IH shall meet with the Contracting Officer (CO) prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's submitted APP to include the AHAP and AHAs appendices. Deficiencies in the APP will be discussed. Onsite work shall not begin until the APP has been accepted.

1.7 SAFETY

Prepare a written comprehensive site-specific Accident Prevention Plan (APP) at least 30 days prior to the preconstruction conference. The APP shall be in accordance with the format and requirements in Appendix A of EM 385-1-1. The APP shall incorporate an Asbestos Hazard Abatement Plan (AHAP), and Activity Hazard Analyses (AHAs) as separate appendices into one site-specific document. See Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS for additional requirements.

1.7.1 Asbestos Hazard Abatement Plan Appendix

The AHAP shall include, but not be limited to, the following:

a. The personal protective equipment to be used;

b. The location and description of regulated areas including clean and dirty areas, access tunnels, and decontamination unit (clean room, shower room, equipment room, storage areas such as load-out unit);

c. Initial exposure assessment in accordance with 29 CFR 1926.1101;
d. Level of supervision;

e. Method of notification of other employers at the worksite;

f. Abatement method to include containment and control procedures;

g. Interface of trades;

h. Sequencing of asbestos related work;

i. Storage and disposal procedures and plan;

j. Type of wetting agent and asbestos encapsulant;

k. Location of local exhaust equipment;

l. Air monitoring methods (personal, environmental and clearance);

m. Bulk sampling and analytical methods (if required);

n. A detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber;

o. Fire and medical emergency response procedures;

p. The security procedures to be used for all regulated areas.

1.7.2 Activity Hazard Analyses Appendix

AHAs for each major phase of work, shall be submitted and updated during the project. The AHAs format shall be in accordance with EM 385-1-1. The analysis shall define the activities to be performed for a major phase of work, identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the AHA has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the onsite Government representatives. The AHAs shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations.

1.7.3 Local Exhaust System

Local exhaust units shall conform to ASSE Z9.2 and 29 CFR 1926.1101. Filters on local exhaust system equipment shall conform to ASSE Z9.2 and UL 586. Filter shall be UL labeled. Submit pressure differential recordings and Manufacturer's certifications showing compliance with ASSE Z9.2 for:

a. Vacuums.

b. Water filtration equipment.

c. Ventilation equipment.

d. Other equipment required to contain airborne asbestos fibers.

1.8 SECURITY

Barriers to prevent unauthorized entry shall be provided for each regulated area. A log book shall be kept documenting entry into and out of the regulated area. Entry into regulated areas shall only be by personnel
authorized by the Contractor and the CO. Personnel authorized to enter regulated areas shall be trained, medically evaluated, and wear the required personal protective equipment.

1.8.1 Licenses, Permits and Notifications

Obtain necessary licenses, permits and notifications in conjunction with the project's asbestos abatement, transportation and disposal actions and timely notification furnished of such actions as required by federal, state, regional, and local authorities. Notify the state's environmental protection agency responsible for asbestos air emissions, local air pollution control district/agency, state OSHA program, and the CO in writing, at least 10 days prior to the commencement of work, in accordance with 40 CFR 61, Subpart M, and state and local requirements to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents. Notify by Certified Mail, Return Receipt Requested. Furnish copies of the receipts to the CO, in writing, prior to the commencement of work. The associated fees/costs for licenses, permits, and notifications are contract.

1.8.2 Regulated Areas

All Class I, II, and III asbestos work shall be conducted within regulated areas. The regulated area shall be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. Control access to regulated areas, ensure that only authorized personnel enter, and verify that Contractor required medical surveillance, training and respiratory protection program requirements are met prior to allowing entrance.

1.8.3 Warning Signs and Tape

Warning signs and tape printed in English shall be provided at the regulated boundaries and entrances to regulated areas. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area. Warning signs, and displaying the following legend in the lower panel:

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY

1.8.4 Warning Labels

Warning labels shall be affixed to all asbestos disposal containers, asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements are acceptable.

1.9 MEDICAL SURVEILLANCE REQUIREMENTS

Medical surveillance requirements shall conform to 29 CFR 1926.1101. Asbestos workers shall be enrolled in a medical surveillance program that meets 29 CFR 1926.1101 (m) requirements and other pertinent state or local requirements. This requirement shall have been satisfied within the last
12 months. Submit required medical certification and the Physician's written opinion.

1.9.1 Respiratory Protection Program

The Contractor shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134. The Contractor shall establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations.

1.9.2 Respiratory Fit Testing

The Contractor shall conduct a qualitative or quantitative fit test conforming to Appendix A of 29 CFR 1910.134 for each worker required to wear a respirator, and any authorized visitors who enter a regulated area where respirators are required to be worn. A respirator fit test shall be performed prior to initially wearing a respirator and every 12 months thereafter. If physical changes develop that will affect the fit, a new fit test shall be performed. Functional fit checks shall be performed each time a respirator is put on and in accordance with the manufacturer's recommendation.

1.9.3 Respirator Selection and Use Requirements

Provide respirators, and ensure that they are used as required by 29 CFR 1926.1101 and in accordance with CGA G-7 and the manufacturer's recommendations. Respirators shall be approved by the National Institute for Occupational Safety and Health NIOSH, under the provisions of 42 CFR 84, for use in environments containing airborne asbestos fibers. For air-purifying respirators, the particulate filter shall be high-efficiency particulate air (HEPA)/(N-,R-,P-100). The initial respirator selection and the decisions regarding the upgrading or downgrading of respirator type shall be made by the Contractor based on the measured or anticipated airborne asbestos fiber concentrations to be encountered.

1.9.4 Personal Protective Equipment

Three complete sets of personal protective equipment shall be made available to the CO and authorized visitors for entry to the regulated area. The CO and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of personal protective equipment and the site safety and health requirements. Provide workers with personal protective clothing and equipment and ensure that it is worn properly. The Designated Competent Person shall select and approve all the required personal protective clothing and equipment.

1.9.5 Whole Body Protection

Personnel exposed to or having the potential to be exposed to airborne concentrations of asbestos that exceed the PELs, or for all OSHA Classes of work for which a required negative exposure assessment is not produced, shall be provided with whole body protection and such protection shall be worn properly. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the regulated area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the regulated area or be properly laundered in accordance with 29 CFR 1926.1101. The Contractor's Designated
Competent Person, has the authority to take immediate action to upgrade or
downgrade whole body protection when there is an immediate danger to the
health and safety of the wearer.

1.9.5.1 Coveralls
Disposable-breathable coveralls with a zipper front shall be provided.
Sleeves shall be secured at the wrists, and foot coverings secured at the
ankles.

1.9.5.2 Gloves
Gloves shall be provided to protect the hands where there is the potential
for hand injuries (i.e., scrapes, punctures, cuts, etc.).

1.9.5.3 Foot Coverings
Cloth socks shall be provided and worn next to the skin. Footwear, as
required by OSHA and EM 385-1-1, that is appropriate for safety and health
hazards in the area shall be worn. Reusable footwear removed from the
regulated area shall be thoroughly decontaminated or disposed of as ACM
waste.

1.9.5.4 Head Covering
Hood type disposable head covering shall be provided. In addition,
protective head gear (hard hats) shall be provided as required. Hard hats
shall only be removed from the regulated area after being thoroughly
decontaminated.

1.9.5.5 Protective Eye Wear
Eye protection shall be provided, when operations present a potential eye
injury hazard, and shall meet the requirements of ANSI/ISEA Z87.1.

1.10 HYGIENE
Establish a decontamination area for the decontamination of employees,
material and equipment. Ensure that employees enter and exit the regulated
area through the decontamination area.

1.10.1 3-Stage Decontamination Area
A temporary negative pressure decontamination unit that is adjacent and
attached in a leak-tight manner to the regulated area shall be provided.
The decontamination unit shall have an equipment room and a clean room
separated by a shower that complies with 29 CFR 1910.141, unless the
Contractor can demonstrate that such facilities are not feasible.
Equipment and surfaces of containers filled with ACM shall be cleaned prior
to removing them from the equipment room or area. Two separate lockers
shall be provided for each asbestos worker, one in the equipment room and
one in the clean room. Provide a minimum of 2 showers. Wastewater shall
be collected and filtered to remove asbestos contamination. Filters and
residue shall be disposed of as asbestos contaminated material.
Wastewater filters shall be installed in series with the first stage pore
size of 20 microns and the second stage pore size of 5 microns. The floor
of the decontamination unit's clean room shall be kept dry and clean at all
times. Proper housekeeping and hygiene requirements shall be maintained.
Soap and towels shall be provided for showering, washing and drying. Any
cloth towels provided shall be disposed of as ACM waste or shall be laundered in accordance with 29 CFR 1926.1101.

1.10.2 Load-Out Unit

If appropriate, a temporary load-out unit that is adjacent and connected to the regulated area shall be provided. The load-out unit shall be attached in a leak-tight manner to each regulated area.

1.10.3 Single Stage Decontamination Area

A decontamination area (equipment room/area) shall be provided for Class I work involving less than 25 feet or 10 square feet of TSI or surfacing ACM, and for Class II and Class III asbestos work operations where exposures exceed the PELs or where there is no negative exposure assessment. The equipment room or area shall be adjacent to the regulated area for the decontamination of employees, material, and their equipment which could be contaminated with asbestos. The area shall be covered by an impermeable drop cloth on the floor or horizontal working surface. The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area.

1.10.4 Decontamination Area Exit Procedures

Ensure that the following procedures are followed:

a. Before leaving the regulated area, remove all gross contamination and debris from work clothing using a HEPA vacuum.

b. Employees shall remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers for disposal and/or laundering.

c. Employees shall not remove their respirators until showering.

d. Employees shall shower prior to entering the clean room. If a shower has not been located between the equipment room and the clean room or the work is performed outdoors, ensure that employees engaged in Class I asbestos jobs: a) Remove asbestos contamination from their work suits in the equipment room or decontamination area using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area; or b) Remove their contaminated work suits in the equipment room, without cleaning worksuits, and proceed to a shower that is not adjacent to the work area.

1.10.5 Smoking

Smoking, if allowed by the Contractor, shall only be permitted in designated areas approved by the CO.

1.11 TRAINING PROGRAM

Establish and submit a training program as specified by EPA MAP, training requirements at 40 CFR 763, the State of Colorado, and OSHA requirements at 29 CFR 1926.1101 (k)(9). Contractor employees shall complete the required training for the type of work they are to perform and such training shall be documented and provided to the CO.

a. Class I and II operations 32 hours Asbestos Worker Training
b. Class II generic removal 8 hour Asbestos Worker Training

Prior to commencement of work the Contractor's Competent Person shall instruct each worker about:

a. The hazards and health effects of the specific types of ACM to be abated; and

b. The content and requirements of the Contractor's APP to include the AHAP and AHAs and site-specific safety and health precautions.

PART 2   PRODUCTS

2.1 EXPENDABLE SUPPLIES

2.1.1 Glovebag

Glovebags (if used) shall be provided as described in 29 CFR 1926.1101. The glovebag assembly shall be 6 mil thick plastic, prefabricated and seamless at the bottom with preprinted OSHA warning label.

2.1.2 Duct Tape

Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container.

2.1.3 Disposal Containers

Leak-tight (defined as solids, liquids, or dust that cannot escape or spill out) disposal containers shall be provided for ACM wastes as required by 29 CFR 1926.1101. Disposal containers can be in the form of:

a. Disposal Bags
b. Fiberboard Drums
c. Cardboard Boxes

2.1.4 Sheet Plastic

Sheet plastic shall be polyethylene of 6 mil minimum thickness and shall be provided in the largest sheet size necessary to minimize seams. Film shall conform to ASTM D4397, except as specified below:

2.1.4.1 Flame Resistant

Where a potential for fire exists, flame-resistant sheets shall be provided. Film shall conform to the requirements of NFPA 701.

2.1.4.2 Reinforced

Reinforced sheets shall be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between 2 layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.
2.1.5 Mastic Removing Solvent

Mastic removing solvent shall be nonflammable and shall not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite shall have a flash point greater than 140 degrees F.

2.1.6 Leak-tight Wrapping

Two layers of 6 mil minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials too large to be placed in disposal bags. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

2.1.7 Wetting Agents

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM greater than or equal to that provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS above.

2.2 EQUIPMENT

2.2.1 Scales

Scales used for measurement shall be public scales. Weighing shall be at a point nearest the work at which a public scale is available. Scales shall be standard truck scales of the beam type; scales shall be equipped with the type registering beam and an "over and under" indicator; and shall be capable of accommodating the entire vehicle. Scales shall be tested, approved and sealed by an inspector of the State of Colorado. Scales shall be calibrated and resealed as often as necessary and at least once every three months to ensure continuous accuracy. Vehicles used for hauling ACM shall be weighed empty daily at such time as directed and each vehicle shall bear a plainly legible identification mark.

2.2.2 Tools

Vacuums shall be equipped with HEPA filters, of sufficient capacity and necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system. Reusable tools shall be thoroughly decontaminated prior to being removed from regulated areas.

2.2.3 Rental Equipment

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment.

2.2.4 Air Monitoring Equipment

The Contractor's Designated IH shall approve air monitoring equipment. The
equipment shall include, but shall not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute.

b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.

c. Single use standard 25 mm diameter cassette, open face, 0.8 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive extension cowl, and shrink bands for personal air sampling.

d. Single use standard 25 mm diameter cassette, open face, 0.45 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive cowl, and shrink bands when conducting environmental area sampling using NIOSH NMAM Methods 7400 and 7402, (and the transmission electric microscopy method specified at 40 CFR 763 if required).

e. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 4 to plus 140 degrees F and traceable to a NIST primary standard.

PART 3  EXECUTION

3.1  GENERAL REQUIREMENTS

Use the engineering controls and work practices required in 29 CFR 1926.1101 (g) in all operations regardless of the levels of exposure. Personnel shall wear and utilize protective clothing and equipment. Do not permit eating, smoking, drinking, chewing or applying cosmetics in the regulated area. Personnel of other trades, shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions of the Contractor's APP are complied with. Power to the regulated area shall be locked-out and tagged in accordance with 29 CFR 1910.147, and temporary electrical service with ground fault circuit interrupters shall be provided as needed. Temporary electrical service shall be disconnected when necessary for wet removal.

3.2  PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Perform asbestos abatement without damage to or contamination of adjacent work or area. Where such work or area is damaged or contaminated, it shall be restored to its original condition or decontaminated at no expense to the Government. When spills occur, work shall stop in all effected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and air sampling analysis results are obtained and have been evaluated by the Contractor's Designated IH and the CO, work shall proceed.
3.3 OBJECTS

3.3.1 Removal of Mobile Objects

[The Government will remove Furniture and equipment from the area of work before work begins.

3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

Building ventilation system supply and return air ducts in a regulated area shall be isolated by airtight seals to prevent the spread of contamination throughout the system. The airtight seals shall consist of 2 layers of polyethylene. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape.

3.5 METHODS OF COMPLIANCE

3.5.1 Mandated Practices

The specific abatement techniques and items identified shall be detailed in the Contractor's AHAP. Use the following engineering controls and work practices in all operations, regardless of the levels of exposure:

a. Vacuum cleaners equipped with HEPA filters.

b. Wet methods or wetting agents except where it can be demonstrated that the use of wet methods is unfeasible due to the creation of electrical hazards, equipment malfunction, and in roofing.

c. Prompt clean-up and disposal.

d. Inspection and repair of polyethylene.

e. Cleaning of equipment and surfaces of containers prior to removing them from the equipment room or area.

3.5.2 Control Methods

Use the following control methods:

a. Local exhaust ventilation equipped with HEPA filter;

b. Enclosure or isolation of processes producing asbestos dust;

c. Where the feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PELs, use them to reduce employee exposure to the lowest levels attainable and shall supplement them by the use of respiratory protection.

3.5.3 Unacceptable Practices

The following work practices shall not be used:

a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

b. Compressed air used to remove asbestos containing materials, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
c. Dry sweeping, shoveling, or other dry clean up.

d. Employee rotation as a means of reducing employee exposure to asbestos.

3.5.4 Class I Work Procedures

In addition to requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the installation and operation of the control methods.

b. For jobs involving the removal of more than 25 feet or 10 square feet of TSI or surfacing material, place critical barriers over all openings to the regulated area.

c. HVAC systems shall be isolated in the regulated area by sealing with a double layer of plastic or air-tight rigid covers.

d. Impermeable dropcloths (6 mil or greater thickness) shall be placed on surfaces beneath all removal activity.

e. Where a negative exposure assessment has not been provided or where exposure monitoring shows the PEL was exceeded, the regulated area shall be ventilated with a HEPA unit and employees must use PPE.

3.5.5 Specific Control Methods for Class I Work

3.5.6 Class II Work

In addition to the requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the work.

b. For indoor work, critical barriers shall be placed over all openings to the regulated area.

c. Impermeable dropcloths shall be placed on surfaces beneath all removal activity.

3.6 FINAL CLEANING AND VISUAL INSPECTION

After completion of all asbestos removal work and the gross amounts of asbestos have been removed from every surface, any remaining visible accumulations of asbestos shall be collected. For all classes of indoor asbestos abatement projects a final cleaning shall be performed using HEPA vacuum and wet cleaning of all exposed surfaces and objects in the regulated area. Upon completion of the cleaning, conduct a visual pre-inspection of the cleaned area in preparation for a final inspection. The Contractor and the CO shall conduct a final visual inspection of the cleaned regulated area in accordance with ASTM E1368 and document the results. If the CO rejects the clean regulated area as not meeting final cleaning requirements, reclean as necessary and have a follow-on inspection conducted with the CO. Recleaning and follow-up reinspection shall be at the Contractor's expense.
3.7 LOCKDOWN

Prior to removal of plastic barriers and after final visual inspection, a (lockdown) encapsulant shall be spray applied to ceiling, walls, floors, and other surfaces in the regulated area.

3.8 EXPOSURE ASSESSMENT AND AIR MONITORING

3.8.1 General Requirements

a. Exposure assessment, air monitoring and analysis of airborne concentration of asbestos fibers shall be performed in accordance with 29 CFR 1926.1101, and the Contractor's air monitoring plan. Results of breathing zone samples shall be posted at the job site and made available to the CO. Submit all documentation regarding initial exposure assessments, negative exposure assessments, and air-monitoring results.

b. Worker Exposure.

(1) The Contractor's Designated IH shall collect samples representative of the exposure of each employee who is assigned to work within a regulated area. Breathing zone samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of 2, whichever is greater. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 2 at the end of this section.

(2) Workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as averaged over a sampling period of 30 minutes. Should a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside a regulated work area, stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Do not restart work until authorized by the CO.

c. Environmental Exposure

(1) All environmental air monitoring shall be performed by the Contractor's Designated IH.

(2) Environmental air monitoring shall be performed using NIOSH NMAM Method 7400 (PCM).

(3) For environmental air monitoring shall be conducted at a sufficient velocity and duration to establish the limit of detection of the method used at 0.005 f/cc.

(4) Monitoring may be duplicated by the Government at the discretion of the CO and at the Government's expense.

(5) Maintain a fiber concentration inside a regulated area less than or equal to 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement.
At the discretion of the Contracting Officer, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. Should an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA occur inside a regulated work area, stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the CO.

3.8.2 Initial Exposure Assessment

The Contractor's Designated IH shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements, which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess of PELs, or otherwise makes a negative exposure assessment, presume that employees are exposed in excess of the PEL-TWA and PEL-Excursion Limit.

3.8.3 Environmental Air Monitoring During Abatement

Until an exposure assessment is provided to the CO, environmental air monitoring shall be conducted at locations and frequencies that will accurately characterize any evolving airborne asbestos fiber concentrations. The assessment shall demonstrate that the product or material containing asbestos minerals, or the abatement involving such product or material, cannot release airborne asbestos fibers in concentrations exceeding 0.01 f/cc as a TWA under those work conditions having the greatest potential for releasing asbestos. The monitoring shall be at least once per shift at locations including, but not limited to, close to the work inside a regulated area; outside entrances to a regulated area; close to glovebag operations; representative locations outside of the perimeter of a regulated area; inside clean room; and at the exhaust discharge point of local exhaust system ducted to the outside of a containment (if used). If the sampling outside regulated area shows airborne fiber levels have exceeded background or 0.01 f/cc, whichever is greater, work shall be stopped immediately, and the Contracting Officer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the CO.

3.8.4 Air-Monitoring Results and Documentation

Air sample fiber counting shall be completed and results provided within 24 hours (breathing zone samples), and 24 hours (environmental monitoring) after completion of a sampling period. The CO shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall
be signed by testing laboratory analyst, testing laboratory principal and the Contractor's Designated IH. The air sampling results shall be documented on a Contractor's daily air monitoring log. The daily air monitoring log shall contain the following information for each sample:

a. Sampling and analytical method used;

b. Date sample collected;

c. Sample number;

d. Sample type: BZ = Breathing Zone (Personal), E = Environmental,

e. Location/activity/name where sample collected;

f. Sampling pump manufacturer, model and serial number, beginning flow rate, end flow rate, average flow rate (L/min);

g. Calibration date, time, method, location, name of calibrator, signature;

h. Sample period (start time, stop time, elapsed time (minutes));

i. Total air volume sampled (liters);

j. Sample results (f/cc);

k. Laboratory name, location, analytical method, analyst, confidence level. In addition, the printed name and a signature and date block for the Industrial Hygienist who conducted the sampling and for the Industrial Hygienist who reviewed the daily air monitoring log verifying the accuracy of the information.

3.9 CLEANUP CERTIFICATION

When final clean-up is completed, the CO will allow the warning signs and boundary warning tape to be removed. The Contractor and the CO shall visually inspect all surfaces for residual material or accumulated debris. Reclean all areas showing residual materials. The CO will certify in writing that the area is safe before unrestricted entry is permitted.

3.10 CLEANUP AND DISPOSAL

3.10.1 Responsibility for ACM Materials

ACM material resulting from abatement work, except as specified otherwise, shall become the responsibility of the Contractor and shall be disposed of as specified and in accordance with applicable federal, state and local regulations.

3.10.2 Collection and Disposal of Asbestos

All ACM waste shall be collected including contaminated wastewater filters, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing and placed in leak-tight containers. Waste within the containers shall be wetted in case the container is breached. Asbestos-containing waste shall be disposed of at an EPA, state and local approved asbestos landfill. For temporary storage, sealed impermeable containers shall be stored in an asbestos waste load-out unit or in a storage/transportation
conveyance (i.e., dumpster, roll-off waste boxes, etc.) in a manner acceptable to and in an area assigned by the CO. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, state, regional, and local standards. Submit manufacturer's catalog data for all materials and equipment to be used, including brand name, model, capacity, performance characteristics and any other pertinent information. Safety Data Sheets for all chemicals to be used onsite in the same format as implemented in the Contractor's HAZARD COMMUNICATION PROGRAM. Data shall include, but shall not be limited to, the following items:

a. High Efficiency Filtered Air (HEPA) local exhaust equipment
b. Vacuum cleaning equipment
c. Pressure differential monitor for HEPA local exhaust equipment
d. Air monitoring equipment
e. Respirators
f. Personal protective clothing and equipment
g. Glovebags. Written manufacturer's proof that glovebags will not break down under expected temperatures and conditions.
h. Duct Tape
i. Disposal Containers
j. Sheet Plastic
k. Wetting Agent
l. Prefabricated Decontamination Unit
m. Safety Data Sheets (for all chemicals proposed)

3.10.3 Records

3.10.3.1 Asbestos Waste Shipment Records

Complete and provide the CO final completed copies of the Waste Shipment Record for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records, within 3 days of delivery to the landfill. Each Waste Shipment Record shall be signed and dated by the Contractor, the waste transporter and disposal facility operator.
TABLE 2
FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL
(Reference: NIOSH 7400)

Fibers/cc(01.95 percent CL) = X + [(X) * (1.645) * (CV)]
Where: X = ((E)(AC))/((V)(1000))
E = ((F/Nf) - (B/Nb))/Af
CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.
AC = Effective collection area of the filter in square millimeters
V = Air volume sampled in liters
E = Fiber density on the filter in fibers per square millimeter
F/Nf = Total fiber count per graticule field
B/Nb = Mean field blank count per graticule field
Af = Graticule field area in square millimeters
TWA = C1/T1 + C2/T2 = Cn/Tn
Where: C = Concentration of contaminant
T = Time sampled.
<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Minimum No. of Samples</th>
<th>Filter Pore Size (Note 1)</th>
<th>Min. Vol. (Note 2) (Liters)</th>
<th>Sampling Rate (liters/min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Abatement Area 0.5/140 Square Meters (Notes 3 &amp; 4)</td>
<td>0.45 microns</td>
<td>3850</td>
<td>2-16</td>
<td></td>
</tr>
<tr>
<td>Each Room in 1 Abatement Area Less than 140 Square meters</td>
<td>0.45 microns</td>
<td>3850</td>
<td>2-16</td>
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<tr>
<td>Field Blank</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Laboratory Blank</td>
<td>1</td>
<td>0.45 microns</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Notes:
1. Type of filter is Mixed Cellulose Ester.
2. Ensure detection limit for PCM analysis is established at 0.005 fibers/cc.
3. One sample shall be added for each additional 140 square meters. (The corresponding I-P units are 5/1500 square feet).
4. A minimum of 5 samples are to be taken per abatement area, plus 2 field blanks.
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _________________________ CONTRACT NO. ______________________
PROJECT ADDRESS __________________________________________________________
CONTRACTOR FIRM NAME _____________________________________________________
EMPLOYEE'S NAME _________________________,_______________,______,
(Print)               (Last)               (First)      (MI)
Social Security Number:  _______-_______-________,__
(Optional)

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS
BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND
INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER
IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that you be provided
and you complete formal asbestos training specific to the type of work you
will perform and project specific training; that you be supplied with proper
personal protective equipment including a respirator, that you be trained in
its use; and that you receive a medical examination to evaluate your
physical capacity to perform your assigned work tasks, under the
environmental conditions expected, while wearing the required personal
protective equipment. These things are to be done at no cost to you. By
signing this certification, you are acknowledging that your employer has met
these obligations to you. The Contractor will check the block(s) for the type
of formal training you have completed. Review the checked blocks prior to
signing this certification.

FORMAL TRAINING:
_____ a. For Competent Persons and Supervisors: I have completed EPA's
Model Accreditation Program (MAP) training course, "Contractor/Supervisor",
that meets this State's requirements.

b. For Workers:
   _____ (1) For OSHA Class I work: I have completed EPA's MAP training
course, "Worker", that meets this State's requirements.
   _____ (2) For OSHA Class II work (where there will be abatement of more
than one type of Class II materials, i.e., roofing, siding, floor
tile, etc.): I have completed EPA's MAP training course, "Worker",
that meets this State's requirements.
   (3) For OSHA Class II work (there will only be abatement of one
type of Class II material):
       (a) I have completed an 8-hour training class on the elements
of 29 CFR 1926.1101(k)(9)(viii), in addition to the specific work practices
and engineering controls of 29 CFR 1926.1101(g) and hands-on training.
       (b) I have completed EPA's MAP training course, "Worker",
that meets this State's requirements.
   _____ (4) For OSHA Class III work: I have completed at least a 16-hour
course consistent with EPA requirements for training of local education
agency maintenance and custodial staff at 40 CFR 763, Section .92(a)(2) and
the elements of 29 CFR 1926.1101(k)(9)(viii), in addition to the specific
work practices and engineering controls at 29 CFR 1926.1101, and hands-on
training.
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

_____ (5) For OSHA Class IV work: I have completed at least a 2-hr course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, (a)(1), and the elements of 29 CFR 1926.1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926.1101(g) and hands-on training.

_____ c. Workers, Supervisors and the Designated Competent Person: I have completed annual refresher training as required by EPA's MAP that meets this State's requirements.

PROJECT SPECIFIC TRAINING:
_____ I have been provided and have completed the project specific training required by this Contract. My employer's Designated Competent Person conducted the training.

RESPIRATORY PROTECTION:
_____ I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair and contact lens use policy of my employer.

RESPIRATOR FIT-TEST TRAINING:
_____ I have been trained in the proper selection, fit, use, care, cleaning, maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

EPA/STATE CERTIFICATION/LICENSE

I have an EPA/Colorado certification/license as:
Building Inspector/Management Planner; Certification #_____  
Contractor/Supervisor, Certification # _______________________
Project Designer, Certification # ____________________________
Worker, Certification # _________________________________

MEDICAL EXAMINATION:
_____ I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made a determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.
_____ were identified physical limitations to performing the required work tasks.
CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

Date of the medical examination __________________

Employee Signature ______________________________________ date ___________
Contractor Signature _____________________________________ date ___________

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See Hazardous Materials Survey Report to be provided for lead-based paint information for this facility. It is anticipated that dust on surfaces in the facility may be contaminated with lead. Appropriate precautions to prevent worker exposure to airborne lead shall be taken for project work that may cause lead-containing particulate to be entrained in the air.

1.1   REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6 (2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1926.103 Respiratory Protection
29 CFR 1926.21 Safety Training and Education
29 CFR 1926.33 Access to Employee Exposure and Medical Records
29 CFR 1926.55 Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59 Hazard Communication
29 CFR 1926.62 Lead

UNDERWRITERS LABORATORIES (UL)

UL 586 (2009; Reprint Sep 2014) Standard for High-Efficiency Particulate, Air Filter Units

1.2   DEFINITIONS

1.2.1   Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period.

1.2.2   Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but not collected in the breathing zone of personnel
(approximately 5 to 6 feet above the floor).

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations and has the authority to take prompt corrective actions to control the lead hazard. A Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.4 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.5 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.6 High Efficiency Particulate Arrestor (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated particulate. A high efficiency particulate filter demonstrates at least 99.97 percent efficiency against 0.3 micron or larger size particles.

1.2.7 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.

1.2.8 Lead Control Area

A system of control methods to prevent the spread of lead dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.9 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

\[
P E L \text{ (micrograms/cubic meter of air)} = \frac{400}{\text{No. hrs worked per day}}
\]

1.2.10 Material Containing Lead/Paint with Lead (MCL/PWL)

Any material, including paint, which contains lead as determined by the testing laboratory using a valid test method. The requirements of this section do not apply if no detectable levels of lead are found using a quantitative method for analyzing paint or MCL using laboratory instruments.
with specified limits of detection (usually 0.01 percent). An X-Ray
Fluorescence (XRF) instrument is not considered a valid test method.

1.2.11 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an
employee to determine the 8 hour time weighted average concentration in
accordance with 29 CFR 1926.62. Samples shall be representative of the
employees' work tasks. Breathing zone shall be considered an area within a
hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and
centered at the nose or mouth of an employee.

1.2.12 Physical Boundary

Area physically roped or partitioned off around lead control area to limit
unauthorized entry of personnel.

1.3 DESCRIPTION

1.3.1 Description of Work

Construction activities impacting PWL or material containing lead which are
covered by this specification include the demolition and/or disturbance of
paint with lead and or disturbance of surfaces with lead dust in a manner
that may cause lead particulate to become airborne.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent
areas. Coordination procedures shall be explained in the Plan and shall
describe how the Contractor will prevent lead exposure to other contractors
and/or Government personnel performing work unrelated to lead activities.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation;
submittals not having a "G" designation are for information only. When
used, a designation following the "G" designation identifies the office
that will review the submittal for the Government. Submit the following in
accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Occupational and Environmental Assessment Data Report (if
objective data is used to justify excluding the initial
occupational exposure assessment); G, RO

Lead Compliance Plan Including CP Approval
(signature, date, and certification number); G, RO

Competent Person Qualifications; G, RO

Training Certification of Workers and Supervisors; G, RO

Certification of Medical Examinations; G, RO

SD-06 Test Reports
Sampling Results; G, RO
Occupational and Environmental Assessment Data Report; G, RO

SD-07 Certificates
Testing Laboratory Qualifications; G, RO

SD-11 Closeout Submittals

Waste turn-in documents or weight tickets for non-hazardous wastes that are disposed of at sanitary or construction and demolition landfills; G, RO]

1.5 QUALITY ASSURANCE
1.5.1 Qualifications
1.5.1.1 Competent Person (CP)
Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide documented construction project-related experience with implementation of OSHA's Lead in Construction standard (29 CFR 1926.62) which shows ability to assess occupational and environmental exposure to lead, experience with the use of respirators, personal protective equipment and other exposure reduction methods to protect employee health. Submit proper documentation that the CP is trained in accordance with federal, State and local laws.

1.5.1.2 Training Certification
Submit a certificate for each worker and supervisor, signed and dated by the training provider, stating that the employee has received the required lead training specified in 29 CFR 1926.62.

1.5.1.3 Testing Laboratory
Submit the name, address, and telephone number of the testing laboratory selected to perform the air analysis, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.
1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

a. Verify training meets all federal, State, and local requirements.

b. Review and approve Lead Compliance Plan for conformance to the applicable referenced standards.

c. Continuously inspect PWL or MCL work for conformance with the approved plan.

d. Perform (or oversee performance of) air sampling. Recommend upgrades or downgrades (whichever is appropriate based on exposure) on the use of PPE (respirators included) and engineering controls.

e. Ensure work is performed in strict accordance with specifications at all times.

f. Control work to prevent hazardous exposure to human beings and to the environment at all times.

g. Supervise final cleaning of the lead control area, take clearance wipe samples if necessary; review clearance sample results and make recommendations for further cleaning.

h. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Lead Compliance Plan

Submit a detailed job-specific plan of the work procedures to be used in the disturbance of PWL or MCL. The plan shall include a sketch showing the location, size, and details of lead control areas, critical barriers, physical boundaries, location and details of decontamination facilities, and any ventilation system. Include a description of equipment and materials, work practices, controls and job responsibilities for each activity from which lead is emitted. Include in the plan, eating, drinking, smoking, hygiene facilities and sanitary procedures, interface of trades, sequencing of lead related work, any collected waste water and dust containing lead and debris, air sampling, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that lead is not released outside of the lead control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training and strategy, sampling and analysis strategy and methodology, frequency of sampling, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multicontractor worksites to inform affected employees and to clarify responsibilities to control exposures.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of
collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

In order to reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation. Submit a report that supports the determination to reduce full implementation of the requirements of 29 CFR 1926.62 and supporting the Lead Compliance Plan.

a. The initial monitoring shall represent each job classification. The data shall represent the worker’s regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the lead compliance plan per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to lead at any time (1 day) above the action level. Full medical surveillance shall be made available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103. Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62. Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

1.5.2.5 Training

Train each employee performing work that disturbs lead, who performs MCL/PWL disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. If employees are required to wear respirators, establish and implement a respiratory protection program as required by AIHA Z88.6, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.
1.5.2.8 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, State, and local authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the Lead Compliance Plan, including procedures and precautions for the work.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during PWL or MCL handling and disposal, notify the rental agency in writing concerning the intended use of the equipment.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the lead removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, eye, and hand protection. PPE shall remain the property of the Contractor. The Government will provide respiratory protection for the Contracting Officer.
1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better as determined by the Contracting Officer.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer 20 days prior to the start of any lead work.

3.1.1.2 Lead Control Area

a. Physical Boundary - Provide physical boundaries around the lead control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside of the lead control area.

b. Warning Signs - Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Furnishings

The Government will remove furniture and equipment from the building before lead work begins.

3.1.1.4 Decontamination Shower Facility

If required by the work activities, provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.5 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.
3.1.1.6 Mechanical Ventilation System

a. To the extent feasible, use local exhaust ventilation or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

b. Vent local exhaust outside the building and away from building ventilation intakes or ensure system is connected to HEPA filters.

c. Use locally exhausted, power actuated tools or manual hand tools.

3.1.1.7 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.2 LEAD CONTROL AREA

3.2.1 Lead Control Area Requirements

Establish a lead control area by completely establishing barriers and physical boundaries around the area or structure where PWL or MCL removal operations will be performed.

3.3 APPLICATION

3.3.1 Lead Work

Perform lead work in accordance with approved Lead Compliance Plan. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when the work is performed in accordance with 29 CFR 1926.62, and as specified herein. Dispose of all PWL or MCL and associated waste in compliance with federal, State, and local requirements.

3.3.2 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall take precautions to prevent spreading lead-containing dust to uncontaminated areas. Describe exiting procedures in the Lead Compliance Plan.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air Sampling

Conduct sampling for lead in accordance with 29 CFR 1926.62 and as specified herein. Air sampling shall be directed or performed by the CP.

a. The CP shall be on the job site directing the air and wipe sampling and inspecting the PWL or MCL removal work to ensure that the requirements of the contract have been satisfied during the entire PWL or MCL operation.
b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken.

d. Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the lead control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the conditions(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the lead control area free of accumulations of dust and debris. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use pressurized air to clean up the area. At the end of each shift and when the lead operation has been completed, clean the controlled area of visible contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area and wet wiping the area as indicated by the Lead Compliance Plan. Reclean areas showing dust or debris. After visible dust and debris is removed, wet wipe and HEPA vacuum all surfaces in the controlled area. If adjacent areas become contaminated at any time during the work, clean, and visually inspect all contaminated areas. The CP shall then certify in writing that the area has been cleaned of lead contamination.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the lead control area during paint removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62; and that there were no visible accumulations of material and dust containing lead left in the work site. Do not remove the lead control area or roped off boundary and warning signs prior to the Contracting Officer's acknowledgement of receipt of the CP certification.

3.5.2 Disposal

a. All materials shall be disposed in accordance with all laws and provisions and all federal, State or local regulations. Ensure all waste is properly characterized.
3.5.2.1 Disposal Documentation

Provide turn-in documents or weight tickets for non-hazardous waste disposal.

-- End of Section --
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HANDLING OF LIGHTING BALLASTS AND LAMPS CONTAINING PCBs AND MERCURY

04/06

PART 1   GENERAL

1.1  REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

DISTRICT OF COLUMBIA MUNICIPAL REGULATIONS (DCMR)

20 DCMR  (1997) Environment - Chapters 40 to 70, Subtitle E: Hazardous Waste, Chapters 40 - 70

STATE OF MARYLAND CODE OF MARYLAND REGULATIONS (COMAR)

COMAR 26.13  (1988) Chapters .01-.13, Disposal of Controlled Hazardous Substances

STATE OF VIRGINIA ADMINISTRATIVE CODE (VAC)

9 VAC 20-60  Title 9, Agency 20, Chapter 60: Hazardous Waste Management Regulations

9 VAC 20-80  Title 9, Agency 20, Chapter 80: Solid Waste Management Regulations

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.1000  Air Contaminants

40 CFR 260  Hazardous Waste Management System: General

40 CFR 261  Identification and Listing of Hazardous Waste

40 CFR 262  Standards Applicable to Generators of Hazardous Waste

40 CFR 263  Standards Applicable to Transporters of Hazardous Waste

40 CFR 264  Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 265  Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

40 CFR 268  Land Disposal Restrictions
1.2 REQUIREMENTS

Removal and disposal of PCB containing lighting ballasts and associated mercury-containing lamps. Contractor may encounter leaking PCB ballasts.

1.3 DEFINITIONS

1.3.1 Certified Industrial Hygienist (CIH)

A industrial hygienist hired by the contractor shall be certified by the American Board of Industrial Hygiene.

1.3.2 Leak

Leak or leaking means any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

1.3.3 Lamps

Lamp, also referred to as "universal waste lamp", is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

1.3.4 Polychlorinated Biphenyls (PCBs)

PCBs as used in this specification shall mean the same as PCBs, PCB containing lighting ballast, and PCB container, as defined in 40 CFR 761, Section 3, Definitions.

1.3.5 Spill

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges when the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases.

1.3.6 Universal Waste

Universal Waste means any of the following hazardous wastes that are managed under the universal waste requirements 40 CFR 273:

1. Batteries as described in Sec. 273.2 of this chapter;
2. Pesticides as described in Sec. 273.3 of this chapter;
3. Thermostats as described in Sec. 273.4 of this chapter; and
(4) Lamps as described in Sec. 273.5 of this chapter.

1.4 QUALITY ASSURANCE

1.4.1 Regulatory Requirements


1.4.2 Training

Certified industrial hygienist (CIH) shall instruct and certify the training of all persons involved in the removal of PCB containing lighting ballasts and mercury-containing lamps. The instruction shall include: The dangers of PCB and mercury exposure, decontamination, safe work practices, and applicable OSHA and EPA regulations. The CIH shall review and approve the PCB and Mercury-Containing Lamp Removal Work Plans.

1.4.3 Regulation Documents


1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-07 Certificates

Qualifications of CIH; G[, [_____]]

Training Certification; G[, [_____]]

PCB and Lamp Removal Work Plan; G[, [_____]]

PCB and Lamp Disposal Plan; G[, [_____]]

SD-11 Closeout Submittals

Transporter certification of notification to EPA of their PCB waste activities and EPA ID numbers; G[, [_____]]

Certification of Decontamination

Certificate of Disposal and/or recycling. Submit to the Government before application for payment within 30 days of the date that the disposal of the PCB and mercury-containing lamp
waste identified on the manifest was completed.

DD Form 1348-1

[ Testing results

1.6 ENVIRONMENTAL REQUIREMENTS

Use special clothing:

a. Disposable gloves (polyethylene)

b. Eye protection

c. PPE as required by CIH

1.7 SCHEDULING

Notify the Contracting Officer 20 days prior to the start of PCB and mercury-containing lamp removal work.

1.8 QUALITY ASSURANCE

1.8.1 Qualifications of CIH

Submit the name, address, and telephone number of the Industrial Hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit training certification that the Industrial Hygienist is certified, including certification number and date of certification or re-certification.

1.8.2 PCB and Lamp Removal Work Plan

Submit a job-specific plan within [20] [_____] calendar days after award of contract of the work procedures to be used in the removal, packaging, and storage of PCB-containing lighting ballasts and associated mercury-containing lamps. Include in the plan: Requirements for Personal Protective Equipment (PPE), spill cleanup procedures and equipment, eating, smoking and restroom procedures. The plan shall be approved and signed by the Certified Industrial Hygienist. Obtain approval of the plan by the Contracting Officer prior to the start of PCB and/or lamp removal work.

1.8.3 PCB and Lamp Disposal Plan

Submit a PCB and lamp Disposal Plan with [45] [_____] calendar days after award of contract. The PCB and Lamp Disposal Plan shall comply with applicable requirements of federal, state, and local PCB and Universal waste regulations and address:

a. Estimated quantities of wastes to be generated, disposed of, and recycled.

b. Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location. Furnish two copies of EPA and state PCB and mercury-containing lamp waste permit applications and EPA identification numbers, as required.

c. Names and qualifications (experience and training) of personnel who
will be working on-site with PCB and mercury-containing lamp wastes.

d. Spill prevention, containment, and cleanup contingency measures to be implemented.

e. Work plan and schedule for PCB and mercury-containing lamp waste removal, containment, storage, transportation, disposal and or recycling. Wastes shall be cleaned up and containerize daily.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 WORK PROCEDURE

Furnish labor, materials, services, and equipment necessary for the removal of PCB containing lighting ballasts, associated mercury-containing fluorescent lamps, [and high intensity discharge (HID) lamps] in accordance with local, state, or federal regulations. Do not expose PCBs to open flames or other high temperature sources since toxic decomposition by-products may be produced. Do not break mercury containing fluorescent lamps or high intensity discharge lamps.

3.1.1 Work Operations

Ensure that work operations or processes involving PCB or PCB-contaminated materials are conducted in accordance with 40 CFR 761, 40 CFR 262 40 CFR 263, and the applicable requirements of this section, including but not limited to:

a. Obtaining suitable PCB and mercury-containing lamp storage sites.

b. Notifying Contracting Officer prior to commencing the operation.

c. Reporting leaks and spills to the Contracting Officer.

d. Cleaning up spills.

e. Inspecting PCB and PCB-contaminated items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.

f. Maintaining inspection, inventory and spill records.

3.2 PCB SPILL CLEANUP REQUIREMENTS

3.2.1 PCB Spills

Immediately report to the Contracting Officer any PCB spills.

3.2.2 PCB Spill Control Area

Rope off an area around the edges of a PCB leak or spill and post a "PCB Spill Authorized Personnel Only" caution sign. Immediately transfer leaking items to a drip pan or other container.
3.2.3 PCB Spill Cleanup

40 CFR 761, subpart G. Initiate cleanup of spills as soon as possible, but no later than 24 hours of its discovery. Mop up the liquid with rags or other conventional absorbent. The spent absorbent shall be properly contained and disposed of as solid PCB waste.

3.2.4 Records and Certification

Document the cleanup with records of decontamination in accordance with 40 CFR 761, Section 125, Requirements for PCB Spill Cleanup. Provide test results of cleanup and certification of decontamination.

3.3 REMOVAL

3.3.1 Ballasts

As ballast are removed from the lighting fixture, inspect label on ballast. Ballasts without a "No PCB" label shall be assumed to contain PCBs and containerized and disposed of as required under paragraphs STORAGE FOR DISPOSAL and DISPOSAL. If there are less than 1600 "No PCB" labeled lighting ballasts dispose of them as normal demolition debris. [If there are more than 1600 "No PCB" labeled ballasts, establish whether the "No PCB" labeled ballasts contain diethylhexyl phthalate (DEHP) either by test or by checking with the ballast manufacturer indicated on the label. Submit testing results and/or written confirmation from the manufacturer to the Contracting Officer. If the ballasts do not contain DEHP, dispose of them as normal construction debris. If they do contain DEHP, dispose of them as hazardous material in accordance with Federal, State, and local regulations. As a basis of bid assume ballasts with "No PCB" labels do not contain DEHP and may disposed of as normal construction debris. If 1600 or more DEHP ballasts are disposed of in a 24 hour period, notify the National Response Team at 800-424-8802.]

3.3.2 Lighting Lamps

Remove lighting tubes/lamps from the lighting fixture and carefully place (unbroken) into appropriate containers (original transport boxes or equivalent). In the event of a lighting tube/lamp breaking, sweep and place waste in double plastic taped bags and dispose of as universal waste as specified herein.

3.4 STORAGE FOR DISPOSAL

3.4.1 Storage Containers for PCBs

49 CFR 178. Store PCB in containers approved by DOT for PCB.

3.4.2 Storage Containers for lamps

Store mercury containing lamps in appropriate DOT containers. The boxes shall be stored and labeled for transport in accordance with 40 CFR 273.

3.4.3 Labeling of Waste Containers

Label with the following:

a. Date the item was placed in storage and the name of the cognizant activity/building.

c. Label mercury-containing lamp waste in accordance with 40 CFR 273. Affix labels to all lighting waste containers.

3.5 DISPOSAL

Dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.

3.5.1 Identification Number

Federal regulations 40 CFR 761, and 40 CFR 263 require that generators, transporters, commercial storers, and disposers of PCB waste possess U.S. EPA identification numbers. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Uniform Hazardous Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work. For mercury containing lamp removal, Federal regulations 40 CFR 273 require that large quantity handlers of Universal waste (LQHUW) must provide notification of universal waste management to the appropriate EPA Region (or state director in authorized states), obtain an EPA identification number, and retain for three years records of off-site shipments of universal waste. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Universal Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work.

3.5.2 Transporter Certification

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Government. Return a signed copy to the Government before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities (EPA Form 7710-53).

3.5.2.1 Certificate of Disposal and/or Recycling

40 CFR 761. Certificate for the PCBs and PCB items disposed shall include:

a. The identity of the disposal and or recycling facility, by name, address, and EPA identification number.

b. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

c. A statement certifying the fact of disposal and or recycling of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

d. A certification as defined in 40 CFR 761.
3.5.3 Disposal by the Government

Comply with disposal and transportation requirements outlined in 40 CFR 761 and 40 CFR 263. Load and haul PCBs to the storage site at [____], operated by the Defense Reutilization and marketing Officer (DRMO). If the primary [____] site is filled to capacity, contact the Contracting Officer. The transport distance to any storage site will not exceed the distance between the project site and the DRMO storage site at [____].

3.5.3.1 [Delivery] [Government Pick Up]

Contact DRMO at least 5 working days in advance to make arrangements for [delivery of PCB to the storage site.] [pick up of PCB waste by the Government.] Phone [_____] or write to:

Defense Reutilization and Marketing Office
[____]
[____]

3.5.3.2 DD Form 1348-1

Prepare DD Form 1348-1 Turn-in Document (TID), which will accompany the PCB to the storage site. Ensure that a responsible person from the activity that owns the PCB signs the DD Form 1348-1.

-- End of Section --
Above: View south of existing Firing Range

Above: Existing Firing Range showing bullet collection system and overhead baffling
Above: Existing Firing Range showing overhead baffling

Above: Existing Firing Range control booth
Above: Unused west wing of existing Firing Range

Above: Rear of existing Firing Range showing overhead structure, bullet collection system, and concrete retaining wall for berm
FACILITIES CRITERIA (FC)

UNITED STATES AIR FORCE
INDOOR SMALL ARMS FIRING RANGE

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AIR FORCE CIVIL ENGINEER CENTER

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FOREWORD

Facilities Criteria (FC) provide functional requirements (i.e., defined by users and operational needs of a particular facility type) for specific DoD Component(s), and are intended for use with unified technical requirements published in DoD Unified Facilities Criteria (UFC). FC are applicable only to the DoD Component(s) indicated in the title, and do not represent unified DoD requirements. Differences in functional requirements between DoD Components may exist due to differences in policies and operational needs.

All construction outside of the United States is also governed by Status of Forces Agreements (SOFA), Host Nation Funded Construction Agreements (HNFA), and in some instances, Bilateral Infrastructure Agreements (BIA). Therefore, the acquisition team must ensure compliance with the most stringent of the FC, the SOFA, the HNFA, and the BIA, as applicable.

Because FC documents are coordinated with unified DoD technical requirements, they form an element of the DoD UFC system applicable to specific facility types. The UFC system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applicable to the Military Departments, Defense Agencies, and the DoD Field Activities. The UFC System also includes technical requirements and functional requirements for specific facility types, both published as UFC documents and FC documents.

FC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services’ responsibility for providing criteria for military construction. HQ U.S. Army Corps of Engineers (HQ USACE), Naval Facilities Engineering Command (NAVFAC), and the Air Force Civil Engineer Center (AFCEC) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: Criteria Change Request. The form is also accessible from the Internet site listed below.

FC are effective upon issuance and are distributed only in electronic media from the following source: Whole Building Design Guide web site http://dod.wbdg.org/

Refer to UFC 1-200-01, General Building Requirements, for implementation of new issuances on projects.

AUTHORIZED BY:

JOE SCIABICA, SES
Director
Air Force Civil Engineer Center

Superseding: None.

Description: This FC provides guidelines for evaluating, planning, programming, and designing an indoor small arms firing range. The information in this FC applies to the design of all new construction projects, to include additions, alterations, and renovation projects in the continental United States (CONUS) and outside the continental United States (OCONUS). It also applies to the procurement of design-build services for the above-noted projects. Alteration and renovation projects should update existing facilities to meet the guidance and criteria within budgetary constraints.

Reasons for Document: This FC is the initial release to establish requirements for an indoor small arms firing range. It defines the criteria for determining appropriately sized, flexible, cost-optimized, durable, quality-designed facilities on a life cycle basis to support the mission. The plans presented in this FC are concepts only and are primarily intended to communicate functional user and adjacency requirements. A thorough compliance check of all other applicable criteria is required.

Impact: Use of this FC will facilitate and standardize the design of indoor small arms firing ranges throughout the Air Force. It will provide more complete and consistent project requirements and expedite the programming and design of facilities and reduce initial design cost.

Unification Issues: None.
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CHAPTER 1 INTRODUCTION

1-1 GENERAL INFORMATION.

1-1.1 Purpose.

This standard facility prototype design criteria was developed to assist Air Force programmers to prepare and validate DD Form 1391 requirements and to assist A-E design professionals with approved project-specific design requirements. It is a source of basic programming and functional information for a small arms firing range. This standard is consistent with the Air Force Corporate Facilities Standards (AFCFS), Unified Facilities Criteria (UFC), and ETL 11-18. This standard, in conjunction with the AFCFS, defines Air Force expectations for project programming and A-E design decisions.

1-1.2 Objective.

The standard facility prototype design program defines consistent facility requirements across the Air Force enterprise to expedite delivery of a facility. This standard was designed in compliance with AFMAN 32-1084. The objective is to deliver appropriately sized, flexible, cost-optimized, durable, quality-designed facilities on a life cycle basis to support the Air Force mission.

1-2 GENERAL BUILDING REQUIREMENTS.

Comply with UFC 1-200-01, which provides applicability of model building codes and government-unique criteria for typical design disciplines and building systems, as well as for accessibility, antiterrorism (AT), security, high-performance and sustainability requirements (comprehensive requirements are detailed in UFC 1-200-02), and safety. Use this FC in addition to UFC 1-200-01 and the UFCs and government criteria referenced therein.

1-3 REFERENCES.

Appendix A contains a list of related documents and references to use in conjunction with this FC. In general, use the latest available issuance of the reference.

1-4 INSTRUCTIONS.

1-4.1 Method.

The standard facility prototype was developed by determining personnel counts, allowable room sizes, adjacency diagrams between functional spaces, and overall facility space requirements. The standard facility prototype establishes Air Force criteria for the facility type. Use the criteria in conjunction with other Air Force ETLs, departmental publications, and UFCs when programming and designing this facility type. Supplement this FC with a thorough review by individual program managers and operations staff.
1-4.2 Standard Facility Prototype Tools.

This standard facility prototype consists of three parts to be used by programmers and A-Es:

1. Facilities criteria for standard prototype (this FC)
2. Interactive programming spreadsheet
3. Facility Building Information Modeling (BIM) drawings

1-4.3 Facilities/Design Criteria.

The FC document consists of three primary components:

1. Notional site
2. Composite facility adjacency diagram(s)/composite floor plan(s)
3. Modules with associated room data sheets

1-4.3.1 Notional Site.

The notional site presents a notional site plan diagram that indicates key site development criteria; it is not a site-specific solution. The information represents the land requirements to construct this facility and includes associated AT standoff distances and parking. Utilization of existing or shared parking is allowable and may reduce the total acreage required for the facility. Adapt the requirements to the specific site and location and comply with the applicable Installation Development Plan (IDP) and Area Development Plan (ADP) for facility siting.

1-4.3.2 Composite Floor Plans.

The composite floor plans are conceptual solutions that illustrate functional user and adjacency requirements. Plan variations may be rotated, flipped, or reversed to fit the actual site. A thorough compliance check of all other applicable criteria is required even when using the conceptual solutions provided in this FC.

1-4.3.3 Modules.

Spaces and rooms that are integrally related with a specific functional connection or operational flow are grouped into a module. Modules and the associated room data sheets identify specific criteria and additional detail for each functional area of the facility as outlined in the space program sheets in Appendix B. Information is provided in a standard presentation and data sheet format and the required space adjacencies and modules are illustrated in figures.
The resulting shape of the facility assembled from the facility prototype modules must provide construction efficiencies obtained from building proportions and overall configuration. The building footprint shall be organized and well composed. The building design must comply with the installation facility standards (architectural compatibility plan) and the AFCFS. Modules shall not be deconstructed or altered except as indicated in paragraph 1-4.3.4.

1-4.3.4 Module Flexibility/Adjustments.

Utilization of the modules provided is highly recommended to maintain functional relationships, adjacencies, and allowed program areas. Modules contain fixed attributes that are essential to functional requirements. Modules may be rotated, flipped, and reversed to accommodate an overall composition or site issue. When the modules cannot be arranged to produce a constructible floor plan due to site constraints, their proportions may be adjusted to create a constructible plan. Manipulating the module shape must not result in an overall increase in square feet and/or reduce the functionality of any module or the required adjacencies in the composite plan.

Some modules are linked to space requirements that increase or decrease in size based on the personnel count and equipment for a particular mission. In these cases, increase or decrease the size of the module to match the revised scope calculation. This may sometimes require minor adjustments in other adjacent modules so they properly fit together to create a constructible facility floor plan. Spaces must comply with any critical dimensions indicated on module plans. Manipulate as few modules as possible to create a constructible facility. The resulting composite plan must respect the established module’s adjacencies and must not exceed the authorized project scope.

1-4.3.5 Room Data Sheets.

Specific requirements for each room, space, or area are provided on room data sheets that are located following their respective module. Information contained on the data sheets defines the functional and physical requirements for each of the spaces within the facility type.

1-4.4 Programming Spreadsheet(s).

This tool is provided in two formats. A PDF programming sheet is provided in Appendix B primarily as a reference and reflects the baseline standard facility program. The additional interactive programming sheet provides a tool for planners and programmers. It allows the input of authorized personnel positions and special purpose spaces. Updated inputs are automatically calculated and provide new required square footage for each space and the overall facility size. A link is provided in Appendix B for access to the interactive programming spreadsheet.
1-4.5  Facility Drawings – BIM.

This component of the standard facility prototype tools includes both a PDF version and a Revit version of the modules, and rooms and composite floor and site plans. The spaces, rooms and modules shown reflect the baseline standard facility program spreadsheet in Appendix B. The drawings in this FC are exact copies of the larger BIM drawings and comply with the program scope. The BIM drawings provide a starting point for the digitization of building data and a starting point in the design and construction of a facility. BIM drawings are found at the link provided in Appendix B.

1-4.6  Additions and Alterations.

For additions and alterations to existing facilities, use the adjacencies, sizing/scope, and detailed requirements contained in the site diagrams, module drawings, and room data sheets to the maximum extent possible. The functionality and adjacency of the modules are still valid but may require some manipulation to accommodate the existing structure. Move non-structural walls to the greatest extent possible to open up space in existing facilities to make them more receptive to the placement of the modules. The planner and designer shall determine the most efficient means to balance the placement of modules within existing spaces or as a facility addition.

1-4.7  A-E Design Professionals.

The requirements set forth by this standard are the approved space programming and functional layouts in accordance with AFCFS. The Air Force Security Forces Center (AFSFC) must approve variations to functional and operational issues and deviations from core requirements.
CHAPTER 2 SITE AND OVERALL ADJACENCY

2-1 GENERAL FACILITY OVERVIEW.

The indoor small arms range that houses space to fire and train on weapons use is typically a one-story structure that works best as a standalone facility. All Air Force recruits and active personnel must have weapons training, both initial and ongoing certification. This facility provides a safe space to fire live rounds, train on weapon assembly, and clean and maintain weapons. It consists of a large, enclosed space for firing live rounds, student classrooms, weapons cleaning, weapons storage, administration area, and support spaces. Consult the AFCFS to determine overall quality standards for the facility type. This standard facility prototype is considered as a Group II or III hierarchy based on its actual location on the installation.

2-2 FACILITY USERS/OCCUPANTS.

The facility users are as follows:

- Able-bodied active duty, National Guard, and Reserve military personnel
- Able-bodied DOD civilians, contractors, and others as authorized
- Non-range, common areas shall be ABA compliant

2-3 SIZE DETERMINANTS.

The indoor small arms firing range size is generally driven by the installation’s authorized population and mission. The 21-lane facility has been designated as standard.

2-3.1 Indoor Small Arms Firing Range Size.

Indoor small arms firing range sizes vary from 14-lane up to 56-lane facilities. For the purpose of this planning document, the minimum to maximum sizes were analyzed:

- Small, 14 lanes
- Standard, 21 lanes
- Large, 28 to 56 lanes (in increments of 7)

2-4 OPERATIONAL ASPECTS.

The hours of operation are driven by user and mission requirements.
2-5 NOTIONAL SITE.

The site diagram represents a notional layout to reflect site development requirements/criteria only. It is not an actual site design. Siting must comply with the IDP and ADP.

2-6 LOCATION DETERMINANTS (SITE SELECTION) OR SITE LOCATION AND ORIENTATION.

Several factors determine the most appropriate and cost-effective location for an indoor small arms firing range. The availability and capacity of required utilities and the mass/scale of the facility relative to adjacent structures and noise issues shall be analyzed.

2-6.1 Access.

The indoor small arms firing range’s ideal location is in the vicinity of the main Security Forces Squadron facility. Locate the facility with main road access and away from any active pedestrian or populated areas. Provide parking and access drives as close to the facility as possible while complying with AT requirements in UFC 4-010-01. Separate service drives from privately owned vehicle (POV) parking.
Figure 2-1 Notional Site Diagram (21 Lane Facility)

SITE PLAN KEYNOTE LEGEND

1. PRIMARY BUILDING ENTRANCE
2. SCREENED MECHANICAL YARD – RANGE EXHAUST
3. SCREENED MECHANICAL YARD – BUILDING SUPPLY
4. DUMPSTER ENCLOSURE
5. HANDICAPPED PARKING SPACE
6. STAFF/VISITOR PARKING SPACE – 31 TOTAL SPACES
7. SPENT AMMUNITION CONTAINMENT
8. STANDOFF DISTANCE – CONCEPTUAL
9. ACCESS CONTROL GATE
10. SERVICE DRIVE – MECHANICAL EQUIPMENT AND BULLET CONTAINMENT ACCESS
11. SERVICE DRIVE – HVAC AND DELIVERY ACCESS
12. SECONDARY/SERVICE ENTRANCE
13. SECONDARY MEANS OF EGRESS
COMPOSITE FACILITY ADJACENCY.

The space program for the indoor small arms firing range facilities is developed based upon the annual small arms qualification training requirements and authorized manning of the base, as well as historical data from the Air Force Security Forces Center (AFSFC).

The space program developed through the base planning team generally represents the maximum space allowed. The final space program for a new indoor small arms firing range will need to be carefully determined by installation representatives and the criteria in this FC. Additional information is found in Appendix B.

The required space adjacencies are illustrated in Figure 2-2. All program spaces are assigned a module designator. Spaces that must be located next to each other or share an important operational flow are grouped into one module with the intent that the module will remain intact during final design (although it may slightly change shape).

Composite plans represent conceptual solutions for indoor small arms range project requirements. These composite facility plans convey an AFSFC-approved solution. The building shape may be adjusted in response to site requirements or unusual or specific installation issues if approved in accordance with the procedures in Chapter I. See Appendix B for conceptual facility floor plans. Three concept plans and the related BIM drawings are included in Appendix B.
Figure 2-2 Functional Adjacency Diagram

**LEGEND ENTRY/EXIT**

- **B** BUILDING ENTRY
- **E** EQUIPMENT ENTRY
- **SP** SECONDARY/PERSO\N Entry

**MODULES**

- A ADMINISTRATION
- B ARMS RANGE
- C TRAINING
- D MAINTENANCE
- E CLEANING
- F STORAGE
- G UTILITY
- H BUILDING SUPPORT
CHAPTER 3 FACILITY REQUIREMENTS AND CRITERIA MODULES

3-1 ADJACENCY DIAGRAM.

The majority of administration/instructors and trainees will enter the facility through the main building entrance. From that point, access to all other spaces within the facility is from a major circular corridor, etc.
**Figure 3-1 Overall Module Adjacency Diagram**

**ADJACENCY RELATIONSHIP**
- **DIRECT ACCESS**
- **PROXIMITY**
- **PRIMARY ADJACENCY**
- **MODULE BOUNDARY**
- **ENCLOSED AREA**
- **DAYLIGHTING**

<table>
<thead>
<tr>
<th>MODULES ROOM SCHEDULE</th>
<th>LEGEND ENTRY/EXIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 QUEUING</td>
<td>C2 WEAPONS SIMULATOR</td>
</tr>
<tr>
<td>A2 BREAK ROOM</td>
<td>C3 OBSERVATION ROOM</td>
</tr>
<tr>
<td>A3 NCOIC OFFICE</td>
<td>C4 STORAGE</td>
</tr>
<tr>
<td>A4 OPEN OFFICE</td>
<td>D WEAPONS MAINTENANCE SHOP</td>
</tr>
<tr>
<td>A5 ADMIN/INSTRUCTOR STORAGE</td>
<td>E CLEANING</td>
</tr>
<tr>
<td>B1 ARMS RANGE</td>
<td>F1 ARMS VAULT</td>
</tr>
<tr>
<td>B2 RANGE SUPPLIES</td>
<td>F2 ISSUE ROOM</td>
</tr>
<tr>
<td>C1 CLASSROOM</td>
<td>G1 RESTROOMS/LOCKER ROOM</td>
</tr>
<tr>
<td></td>
<td>H BUILDING SUPPORT</td>
</tr>
</tbody>
</table>

**LEGEND ENTRY/EXIT**
- B BUILDING ENTRY
- E EQUIPMENT ENTRY
- P PERSONNEL ENTRY
- SP SECONDARY/PERSONNEL

*FC 4-179-03F*
*1 April 2015*
### Figure 3-3 Administrative Instructor Storage Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Storage space for office supplies, file storage, and instructor’s personal effects.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9'-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/Kick-Plates</td>
<td>Kick-plate</td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Gypsum board</td>
</tr>
<tr>
<td>Floor</td>
<td>Concrete</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Exposed to structure</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
</tr>
<tr>
<td>HVAC</td>
<td>Air conditioned and heated</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>One 120V convenience outlet</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED (5 fc) lighting</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>N/A</td>
</tr>
<tr>
<td>Data</td>
<td>N/A</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td>Acoustical</td>
<td>N/A</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Storage shelving for office supplies; filing cabinets; 2'-0” x 2'-0” single-tier equipment storage lockers (one per instructor and NCOIC)</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Expandable, with open office based upon number of instructors</td>
</tr>
</tbody>
</table>
**Figure 3-4 Break Room Data Sheet**

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Room for students and instructors to get coffee or eat meals.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>Daylighting requirements per UFC 1-200-02</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>N/A</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>N/A</td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Impact-resistant gypsum board, paint</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed/stained concrete or tile</td>
</tr>
<tr>
<td>Base</td>
<td>Rubber/vinyl or tile</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Acoustical ceiling tile</td>
</tr>
<tr>
<td><strong>Plumbing</strong></td>
<td>Connections for coffee maker, sink with disposer, refrigerator, and floor drain</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td>Air conditioned and heated</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>120V dedicated circuits for coffee maker, microwave and refrigerator; 120V convenience outlets for vending machine(s)</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Fluorescent or LED lighting (20 fc) with ceiling-mounted occupancy sensors</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>One public-use wall phone</td>
</tr>
<tr>
<td>Data</td>
<td>Base-specific Wi-Fi</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Acoustical</strong></td>
<td>Minimum STC rating of 42 between occupied spaces and break room</td>
</tr>
<tr>
<td><strong>Furnishings, Equipment, and Casework</strong></td>
<td>Coffee maker; microwave; refrigerator; upper and lower cabinets with sink; seating-tables or bar style w/seating</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></td>
<td>Break area in close proximity to queuing room; break area based upon 16% of total building occupants multiplied by 18 square feet per occupant.</td>
</tr>
</tbody>
</table>
## Figure 3-5 NCOIC Office Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Private office for non-commissioned officer in charge.</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>Daylighting requirements per UFC 1-200-02</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Doors</th>
<th>Type</th>
<th>Hollow metal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
<td></td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Finishes</th>
<th>Walls</th>
<th>Gypsum board, paint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Floor</td>
<td>Sealed/stained concrete or carpet tile</td>
</tr>
<tr>
<td></td>
<td>Base</td>
<td>Vinyl/rubber or tile</td>
</tr>
<tr>
<td></td>
<td>Ceiling</td>
<td>Acoustical ceiling tile</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>HVAC</td>
<td>Air conditioned and heated</td>
<td></td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>120V convenience outlets. One per wall, quad outlet at desk</td>
<td></td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED (50 fc) lighting with ceiling-mounted occupancy sensor</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>Tele. Outlet at desk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data One data outlet at desk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CCTV N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CATV N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security N/A</td>
<td></td>
</tr>
<tr>
<td>Acoustical</td>
<td>Minimum STC rating of 42</td>
<td></td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Desk with chair; 2 guest chairs; computer</td>
<td></td>
</tr>
<tr>
<td>Special Requirements</td>
<td>140 square foot private office</td>
<td></td>
</tr>
</tbody>
</table>
### Figure 3-6 Open Office Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Open office for range instructors to perform daily administrative duties.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>Daylighting requirements per UFC 1-200-02</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>Kick-plates</td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Gypsum board with chair rails, paint</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed/stained concrete or carpet tile</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl/rubber or tile</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Acoustical ceiling tile</td>
</tr>
<tr>
<td><strong>Plumbing</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td>Air conditioned and heated</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>120V convenience quad outlets at each work station; copier and other office equipment; charging station</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Fluorescent or LED (50 fc) lighting; ceiling-mounted occupancy sensor and daylighting sensor</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>One outlet at each work station</td>
</tr>
<tr>
<td>Data</td>
<td>One outlet at each work station</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Acoustical</strong></td>
<td>Minimum STC rating of 42</td>
</tr>
<tr>
<td><strong>Furnishings, Equipment, and Casework</strong></td>
<td>Desks with chairs (one per instructor); 2 guest chairs; computer (one per instructor); copier with table; radio charging station with table</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></td>
<td>Open office to expand with range size; one instructor for each seven students; Open office area based upon 80 square feet per instructor with additional 20 square feet for admin support</td>
</tr>
<tr>
<td>Description/Usage</td>
<td>Queuing area for range students awaiting instruction; includes seating (size based upon range capacity) and display area.</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ceiling Height</td>
<td>9'-0&quot; minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>Daylighting requirements per UFC 1-200-02</td>
</tr>
<tr>
<td>Doors</td>
<td>Type: Pair 3'-0&quot; x 7'-0&quot; anodized aluminum door and frames with sidelights; optional 3'-0&quot; x 7'-0&quot; aluminum door with removable sidelights. Security/ Hardware: Keyed lock set (minimum); possible access control. View Panels/ Kick-Plates: Sidelights.</td>
</tr>
<tr>
<td>Finishes</td>
<td>Walls: Impact-resistant gypsum board, paint. Floor: Sealed/stained concrete or tile. Base: Rubber/vinyl or tile. Ceiling: Open to structure or acoustical ceiling tile.</td>
</tr>
<tr>
<td>Plumbing</td>
<td>Electric water cooler</td>
</tr>
<tr>
<td>HVAC</td>
<td>Air conditioned and heated</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>120V convenience outlets/wall-mounted TV; display case</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED lighting (15 fc) with ceiling-mounted occupancy sensor</td>
</tr>
<tr>
<td>Communication</td>
<td>Tele.: One public-use wall phone. Data: Base-specific Wi-Fi. CCTV: N/A. CATV: Base-specific. Security: N/A.</td>
</tr>
<tr>
<td>Acoustical</td>
<td>Minimum STC rating of 42</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Display case; chairs (number based upon range capacity, minimum one chair per lane); wall-mounted TV; end tables.</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Queuing area changes with range size, based upon total number of firing lanes at 20 square feet per student including area for circulation. Additional square feet for entry vestibule; provide walk-off mat.</td>
</tr>
</tbody>
</table>
3-3 MODULE B: ARMS RANGE – 21 LANES.

Figure 3-8 Floor Plan and Axonometric

MODULE B

ARMS RANGE

PROGRAMMING WORKSHEETS

ROOM SCHEDULE

ROOM NAME

AREA

ARMS RANGE

See Appendix - B

CONTROL BOOTH

RANGE SUPPLIES

MECHANICAL YARD
**Figure 3-9 Arms Range Data Sheet**

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Indoor arms range for weapons training with control room. Allows firing from standing, kneeling, prone, and barricade positions. Fourteen (14) lane minimum, expandable to 56 lane maximum; automatic target retrieving system adjustable; bullet trap with deceleration chamber and dust and solids collection.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9’-0” minimum (10’-0” minimum clearance to steel baffles over firing lanes)</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td>Doors</td>
<td>Acoustical hollow metal doors, two pair 3’-0” x 7’-0”</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lockset or cipher system</td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>Kick-plates on all doors</td>
</tr>
<tr>
<td>Finishes</td>
<td>CMU or cast-in-place concrete (unpainted) with acoustical panels</td>
</tr>
<tr>
<td>Walls</td>
<td>Sealed concrete</td>
</tr>
<tr>
<td>Floor</td>
<td>N/A</td>
</tr>
<tr>
<td>Base</td>
<td>Steel baffles with acoustical panels</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
</tr>
<tr>
<td>HVAC</td>
<td>Laminar airflow 75 fpm; see para. 4-5.2</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Visual strobes and mass notification. No sprinkler system.</td>
</tr>
<tr>
<td>Power</td>
<td>Specific for target retrieval and bullet collection systems</td>
</tr>
<tr>
<td>Lighting</td>
<td>Special lighting (controlled by control room); target controls</td>
</tr>
<tr>
<td>Communication</td>
<td>One outlet in control room</td>
</tr>
<tr>
<td>Tele.</td>
<td>One outlet in control room; one outlet near bullet collection</td>
</tr>
<tr>
<td>Data</td>
<td>N/A</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>None</td>
</tr>
<tr>
<td>Security</td>
<td>None</td>
</tr>
<tr>
<td>Acoustical</td>
<td>Provide acoustical panels at perimeter walls and baffles in sufficient quantity to meet noise reduction criteria of ETL 11-18</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Preparation area with wall-mounted benches and tables; control room with range control system; barricades; bullet trap system; acoustical panels; automatic target retrieval system. See BIM drawings for additional information.</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Refer to ETL 11-18 for small arms range requirements</td>
</tr>
</tbody>
</table>
## Figure 3-10 Control Booth Room Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Area for control of range operations.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>Full range visibility</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Type</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Security/ Hardware</strong></td>
</tr>
<tr>
<td></td>
<td><strong>View Panels/ Kick-Plates</strong></td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Walls</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Floor</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Base</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Ceiling</strong></td>
</tr>
<tr>
<td><strong>Plumbing</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td>Air conditioned and heated w/separate unit; see para. 4-5.2 (maintain positive air pressure)</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>120V power strip(s) for controls</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Fluorescent or LED (15 fc) light fixtures with wall-mounted dimming control</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Tele.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Data</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Control</strong></td>
</tr>
<tr>
<td></td>
<td><strong>PA</strong></td>
</tr>
<tr>
<td><strong>Acoustical</strong></td>
<td>NRC (noise reduction coefficient) 0.85 or higher</td>
</tr>
<tr>
<td><strong>Furnishings, Equipment, and Casework</strong></td>
<td>Countertop and two workstations</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></td>
<td>Locate adjacent to arms range with direct access to corridor</td>
</tr>
<tr>
<td>Description/Usage</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Area for storage of targets and other range-required supplies; secure tool storage.</td>
<td></td>
</tr>
<tr>
<td>Ceiling Height</td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td>Doors</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal, pair 3’-0” x 7’-0”</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>Kick-plates on door</td>
</tr>
<tr>
<td>Finishes</td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Concrete; CMU</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed concrete</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Open to structure</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
</tr>
<tr>
<td>HVAC</td>
<td>Exhaust only (provide ducted make-up air or outside air grill)</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>120V convenience outlet; two per room</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED (15 fc) light fixtures with wall-mounted occupancy sensor</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>N/A</td>
</tr>
<tr>
<td>Data</td>
<td>N/A</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td>Acoustical</td>
<td>N/A</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Shelving racks for supply storage; wire mesh partition for secure tools and materials storage</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Locate adjacent to arms range with direct access</td>
</tr>
</tbody>
</table>
Figure 3-12 Floor Plan and Axonometric
Figure 3-13 Classroom Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Instructor-based arms training in classroom setting, including vehicle weapons mount training.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>Daylighting requirements per UFC 1-200-02</td>
</tr>
<tr>
<td>Doors</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Pair 4’-0” x 7’-0” hollow metal doors</td>
</tr>
<tr>
<td>Security/Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/Kick-Plates</td>
<td>Kick-plates</td>
</tr>
<tr>
<td>Finishes</td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Concrete/CMU, painted</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed/stained concrete or tile</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl/rubber or tile</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Open to structure or acoustical ceiling tile</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
</tr>
<tr>
<td>HVAC</td>
<td>Air conditioned and heated</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>120V convenience outlets; ten 1f on center around perimeter; projector outlet(s); dedicated circuit for podium</td>
</tr>
<tr>
<td>Lighting</td>
<td>Dimmable fluorescent or LED lighting fixtures (50 fc) with ceiling-mounted occupancy sensors and override switches; daylight sensors</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>One wall outlet near podium</td>
</tr>
<tr>
<td>Data</td>
<td>One wall outlet near podium</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>One wall outlet near podium; base-specific</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td>Acoustical</td>
<td>Minimum STC rating of 50</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>7’-0” x 7’-0” vehicle mount mockup; projector set up or wall-mounted TV; 36” x 48” tables with 2 stackable chairs per table; 36” x 48” instructor table; instructor podium; stackable chairs for additional instructors (1 instructor per 7 students); motorized blackout screens for fenestration</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>22-person classroom is standard for 21-lane range with one seat per firing lane and additional seating for instructors; expandable with range; verify egress requirements for larger facilities</td>
</tr>
</tbody>
</table>
### Figure 3-14 Observation Room Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Provides observation of classroom and simulator instruction.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>One-way glass window units to classroom and simulator</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal, 3’-0” x 7’-0”</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>Kick-plates</td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Concrete/CMU, painted</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed/stained concrete or tile</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl/rubber or tile</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Acoustical ceiling tile</td>
</tr>
<tr>
<td><strong>Plumbing</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td>Air conditioned and heated</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>120V convenience outlet for each workstation</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Fluorescent or LED lighting fixtures (20 fc) with ceiling-mounted occupancy sensors and override switches; dimmable</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>One outlet per workstation</td>
</tr>
<tr>
<td>Data</td>
<td>One outlet per workstation</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td>Acoustical</td>
<td>Minimum STC rating of 46</td>
</tr>
<tr>
<td><strong>Furnishings, Equipment, and Casework</strong></td>
<td>Desk with chair for each viewing area; computer</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></td>
<td>Used in conjunction with classroom and simulator; Observation area based upon 64 square feet per occupant</td>
</tr>
</tbody>
</table>
Figure 3-15 Classroom/Simulator Room Storage Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Storage for classroom and simulator items.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal, 3’-0” x 7’-0”</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/Kick-Plates</td>
<td>Kick-plates</td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Concrete/CMU, painted</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed/stained concrete or tile</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl/rubber or tile</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Acoustical ceiling tile</td>
</tr>
<tr>
<td><strong>Plumbing</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td>Provide conditioned supply air</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Fluorescent or LED lighting fixtures (5 fc) with wall-mounted occupancy sensor</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>N/A</td>
</tr>
<tr>
<td>Data</td>
<td>N/A</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Acoustical</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Furnishings, Equipment, and Casework</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></td>
<td>Provide storage room for each classroom and/or simulator module; expandable with range size.</td>
</tr>
</tbody>
</table>
### Figure 3-16 Weapons Simulator Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Description/Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Computer-based marksmanship training. Can be used as alternate classroom. Simulator size and controls configuration determined by manufacturer’s requirements.</td>
</tr>
<tr>
<td>Ceiling Height</td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Hollow metal, pair 3’-0” x 7’-0”</td>
</tr>
<tr>
<td>Doors</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td></td>
<td>Kick-plates</td>
</tr>
<tr>
<td>Finishes</td>
<td>Concrete/CMU, paint</td>
</tr>
<tr>
<td></td>
<td>Sealed/stained concrete or tile</td>
</tr>
<tr>
<td></td>
<td>Vinyl/rubber or tile</td>
</tr>
<tr>
<td></td>
<td>Acoustical ceiling tile</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
</tr>
<tr>
<td>HVAC</td>
<td>Air conditioned and heated</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>120V convenience outlets; dedicated circuit for simulator system</td>
</tr>
<tr>
<td>Lighting</td>
<td>Dimmable fluorescent or LED lighting fixtures (50 fc) with ceiling-mounted occupancy sensors</td>
</tr>
<tr>
<td>Communication</td>
<td>One outlet at front</td>
</tr>
<tr>
<td></td>
<td>One outlet at front</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>One outlet at front; base-specific</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Commercially purchased projection-based simulator system; desk with chair; computer; simulator instructor booth</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Simulator module is preferred module; module can be deleted based upon specific base installation requirements and budgeted facilities</td>
</tr>
</tbody>
</table>
Figure 3-17 Floor Plan and Axonometric
**Figure 3-18 Weapons Maintenance Shop Data Sheet**

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Space to restore/maintain weapons to serviceable condition. Primarily for instructor use.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal, pair 3’-0” x 7’-0”</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/Kick-Plates</td>
<td>Kick-plates</td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>CMU, paint</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed concrete</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Open to structure</td>
</tr>
<tr>
<td><strong>Plumbing</strong></td>
<td>Connections for shop sink and emergency eyewash</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td>Air conditioned and heated w/exhaust ventilation for chemicals</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>120V convenience outlets around room and at work spaces; provide power to workbenches and grinding wheel stand</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Fluorescent or LED lighting fixtures (50 fc) with wall-mounted occupancy sensor; task lighting at repair stations</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>One outlet</td>
</tr>
<tr>
<td>Data</td>
<td>One outlet</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Acoustical</strong></td>
<td>Minimum STC rating of 50</td>
</tr>
<tr>
<td><strong>Furnishings, Equipment, and Casework</strong></td>
<td>Lockable parts storage cabinets; stainless steel workbenches; grinding wheel with stand; shop sink; table with vise; flammable storage cabinets; emergency eyewash</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></td>
<td>Expandable with range; provide one workbench per instructor;</td>
</tr>
</tbody>
</table>
MODULE E: CLEANING.

Figure 3-19 Floor Plan and Axonometric
### Figure 3-20 Student Weapons Cleaning Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Space for instructor-supervised weapons cleaning procedures performed by students.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>N/A</td>
</tr>
</tbody>
</table>
| **Doors**               | **Type**  
Hollow metal, pair 3’-0” x 7’-0”  
**Security/ Hardware**  
Keyed lock set  
**View Panels/ Kick-Plates**  
Kick-plates |
| **Finishes**            | **Walls**  
CMU/impact-resistant gypsum board, paint  
**Floor**  
Sealed concrete  
**Base**  
Vinyl  
**Ceiling**  
Acoustical ceiling tile |
| **Plumbing**            | Connections for shop sink and emergency eyewash                                    |
| **HVAC**                | Air conditioned and heated w/exhaust ventilation                                    |
| **Fire Protection**     | Automatic sprinkler system (see UFC 3-600-01)                                       |
| **Power**               | 120V convenience outlets at all tables                                              |
| **Lighting**            | Fluorescent or LED lighting fixtures (50 fc) with ceiling-mounted occupancy sensors; task lighting at cleaning stations |
| **Communication**       | **Tele.**  
One outlet  
**Data**  
One outlet  
**CCTV**  
N/A  
**CATV**  
N/A  
**Security**  
N/A |
| **Acoustical**          | Minimum STC rating of 50                                                           |
| **Furnishings, Equipment, and Casework** | Continuous stainless steel U-shaped perimeter table (standing height); lockable storage cabinets; shop sink; emergency eyewash; flammable storage cabinets; hazardous waste receptacles |
| **Special Requirements** | Expandable with range; verify egress requirements for larger facilities |
### Figure 3-22 Arms Vault Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Weapons and ammunition storage and distribution. Vault constructed area to provide secure storage of arms and ammunition; secure storage of ammunition separate from arms; issue window.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9'-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td>Doors</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>GSA-approved Class V vault door</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>N/A</td>
</tr>
<tr>
<td>View Panels/Kick-Plates</td>
<td>N/A</td>
</tr>
<tr>
<td>Finishes</td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Concrete/CMU, paint</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed concrete</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Concrete</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
</tr>
<tr>
<td>HVAC</td>
<td>Air conditioned and heated (maintain RH &lt; 65%)</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>120V outlets at all workstations</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED (30 fc)</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>One outlet at workstation</td>
</tr>
<tr>
<td>Data</td>
<td>One outlet at workstation</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>Access control and door switch monitoring</td>
</tr>
<tr>
<td>Acoustical</td>
<td>N/A</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Clearing barrel; issue window; GSA-approved Class V vault door; wire mesh partition for ammunition storage; desk and chair; computer; arms rack (number determined by location requirements)</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Day gate optional based upon specific base installation; expandable with range</td>
</tr>
</tbody>
</table>
### Figure 3-23 Issue Room Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area for students to obtain and safely clear arms.</td>
<td></td>
</tr>
<tr>
<td>Ceiling Height</td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td>Doors</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>Kick-plates</td>
</tr>
<tr>
<td>Walls</td>
<td>CMU/impact-resistant gypsum board, paint</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed concrete</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Acoustical ceiling tile</td>
</tr>
<tr>
<td>Plumbing</td>
<td>N/A</td>
</tr>
<tr>
<td>HVAC</td>
<td>Year-round temperature control</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>One outlet near window</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED lighting fixtures (20 fc) with ceiling-mounted occupancy sensor</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>N/A</td>
</tr>
<tr>
<td>Data</td>
<td>N/A</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>Intrusion detection system (IDS)</td>
</tr>
<tr>
<td>Acoustical</td>
<td>N/A</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>GSA-approved two-drawer safe; clearing barrel (design per AFMAN 31-229)</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>Maintain 12’-0” clear depth of room; expandable with arms vault</td>
</tr>
</tbody>
</table>
MODULE G: UTILITY.

Figure 3-24 Floor Plan and Axonometric

<table>
<thead>
<tr>
<th>ROOM NAME</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>JANITOR'S</td>
<td></td>
</tr>
<tr>
<td>LAUNDRY</td>
<td></td>
</tr>
<tr>
<td>MEN'S RESTROOM</td>
<td></td>
</tr>
<tr>
<td>WOMEN'S RESTROOM</td>
<td></td>
</tr>
</tbody>
</table>

See Appendix-B Programming Worksheets

LAUNDRY ROOM (worksheets)
### Figure 3-25 Janitor's Closet Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Storage for cleaning supplies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9'-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td>Doors Type</td>
<td>Hollow metal, 3’-0” x 7’-0”</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>Keyed lock set</td>
</tr>
<tr>
<td>View Panels/ Kick-Plates</td>
<td>Kick-plate</td>
</tr>
<tr>
<td>Walls</td>
<td>Moisture-resistant gypsum board; cement board at wet walls, paint</td>
</tr>
<tr>
<td>Floor</td>
<td>Sealed concrete</td>
</tr>
<tr>
<td>Base</td>
<td>Vinyl</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Moisture-resistant gypsum board</td>
</tr>
<tr>
<td>Plumbing</td>
<td>Connection for utility sink, floor drain</td>
</tr>
<tr>
<td>HVAC</td>
<td>Exhausted (provide fresh make-up air)</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>None</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED lighting fixtures (5 fc) with ceiling-mounted occupancy sensors</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>N/A</td>
</tr>
<tr>
<td>Data</td>
<td>N/A</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td>Acoustical</td>
<td>N/A</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Stainless-steel shelving with integrated mop holders; floor-mounted utility sink</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>None</td>
</tr>
</tbody>
</table>
Figure 3-26 Restroom/Locker Room Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Restroom facilities for students and instructors; locker/shower room facilities for instructors to remove potential lead contamination.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9'-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td>Doors</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Hollow metal, if utilized</td>
</tr>
<tr>
<td>Security/ Hardware</td>
<td>N/A</td>
</tr>
<tr>
<td>View Panels/Kick-Plates</td>
<td>N/A</td>
</tr>
<tr>
<td>Finishes</td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td>Moisture-resistant gypsum board; cement board at wet walls; tile at wet areas near fixtures or tile wainscot</td>
</tr>
<tr>
<td>Floor</td>
<td>Tile</td>
</tr>
<tr>
<td>Base</td>
<td>Tile</td>
</tr>
<tr>
<td>Ceiling</td>
<td>Moisture-resistant gypsum board</td>
</tr>
<tr>
<td>Plumbing</td>
<td>Connections for lavatories, water closets, urinals, showers; floor drain</td>
</tr>
<tr>
<td>HVAC</td>
<td>Year-round temperature control, humidity control, exhaust at showers</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>Outlet for hand dryer and hair dryer in locker area</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED lighting fixtures (10 fc) with ceiling-mounted occupancy sensors; moisture-resistant</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>N/A</td>
</tr>
<tr>
<td>Data</td>
<td>N/A</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td>Acoustical</td>
<td>N/A</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Vanities with lavatories; urinals; toilet partitions with water closets; urinal partitions; toilet and shower accessories; accessible and standard benches; accessible showers; lockers; mirrors at lavatories and shower areas</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>70/30 male to female ratio typical (verify with location requirements) plumbing fixture count per UFC 3-420-01; Provide lockers per location requirements</td>
</tr>
</tbody>
</table>
Figure 3-27 Laundry Room Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Laundry facilities for instructors to remove lead contamination.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Height</td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td>Windows</td>
<td>N/A</td>
</tr>
<tr>
<td>Doors</td>
<td>Type: Hollow metal, 3’-0” x 7’-0”</td>
</tr>
<tr>
<td></td>
<td>Security/Hardware: Standard</td>
</tr>
<tr>
<td></td>
<td>View Panels/Kick-Plates: Kick-plate</td>
</tr>
<tr>
<td>Finishes</td>
<td>Walls: Moisture-resistant gypsum board, paint</td>
</tr>
<tr>
<td></td>
<td>Floor: Sealed concrete</td>
</tr>
<tr>
<td></td>
<td>Base: Vinyl</td>
</tr>
<tr>
<td></td>
<td>Ceiling: Moisture-resistant gypsum board</td>
</tr>
<tr>
<td>Plumbing</td>
<td>Connection for washer</td>
</tr>
<tr>
<td>HVAC</td>
<td>Vent dryer and exhaust room air (provide fresh make-up air)</td>
</tr>
<tr>
<td>Fire Protection</td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td>Power</td>
<td>Connection for washer and dryer</td>
</tr>
<tr>
<td>Lighting</td>
<td>Fluorescent or LED lighting fixtures (10 ft) with ceiling-mounted occupancy sensors</td>
</tr>
<tr>
<td>Communication</td>
<td>Tele: N/A</td>
</tr>
<tr>
<td></td>
<td>Data: N/A</td>
</tr>
<tr>
<td></td>
<td>CCTV: N/A</td>
</tr>
<tr>
<td></td>
<td>CATV: N/A</td>
</tr>
<tr>
<td></td>
<td>Security: N/A</td>
</tr>
<tr>
<td>Acoustical</td>
<td>Minimum STC rating of 50</td>
</tr>
<tr>
<td>Furnishings, Equipment, and Casework</td>
<td>Washer; dryer; 2’-0” x 4’-0” stainless-steel layout table</td>
</tr>
<tr>
<td>Special Requirements</td>
<td>None</td>
</tr>
</tbody>
</table>
MODULE H: BUILDING SUPPORT.
### Figure 3-29 Building Support Data Sheet

<table>
<thead>
<tr>
<th>Description/Usage</th>
<th>Space for mechanical, electrical, and telecommunications systems.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ceiling Height</strong></td>
<td>9’-0” minimum</td>
</tr>
<tr>
<td><strong>Windows</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Hollow metal</td>
</tr>
<tr>
<td><strong>Security/Hardware</strong></td>
<td>Keyed lock set</td>
</tr>
<tr>
<td><strong>View Panels/Kick-Plates</strong></td>
<td>Kick-plate</td>
</tr>
<tr>
<td><strong>Finishes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Walls</strong></td>
<td>Gypsum board/CMU</td>
</tr>
<tr>
<td><strong>Floor</strong></td>
<td>Sealed concrete</td>
</tr>
<tr>
<td><strong>Base</strong></td>
<td>Vinyl</td>
</tr>
<tr>
<td><strong>Ceiling</strong></td>
<td>Open to structure</td>
</tr>
<tr>
<td><strong>Plumbing</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Floor drains, water connections; compressed air</td>
</tr>
<tr>
<td><strong>HVAC</strong></td>
<td>Ventilated w/fresh air (provide conditioned air for telecom rm)</td>
</tr>
<tr>
<td><strong>Fire Protection</strong></td>
<td>Automatic sprinkler system (see UFC 3-600-01)</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>120V outlet on each wall; circuit connections to specific equipment</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td>Fluorescent or LED fixtures (10 fc)</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Tele.</td>
<td>One outlet; service entrance to main room rack</td>
</tr>
<tr>
<td>Data</td>
<td>One outlet</td>
</tr>
<tr>
<td>CCTV</td>
<td>N/A</td>
</tr>
<tr>
<td>CATV</td>
<td>N/A</td>
</tr>
<tr>
<td>Security</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Acoustical</strong></td>
<td>Minimum STC rating of 50 at mechanical room walls</td>
</tr>
<tr>
<td><strong>Furnishings, Equipment, and Casework</strong></td>
<td>Mechanical, electrical and telecommunication equipment</td>
</tr>
<tr>
<td><strong>Special Requirements</strong></td>
<td>Design each system per appropriate UFC document</td>
</tr>
</tbody>
</table>
CHAPTER 4 TECHNICAL CRITERIA

4-1 GENERAL.

Comply with UFC 1-200-01, which provides the applicability of model building codes and government-unique criteria for typical design disciplines and building systems, as well as for accessibility, AT, security, high-performance and sustainability requirements (comprehensive requirements are detailed in UFC 1-200-02), and safety. Use this FC in addition to UFC 1-200-01 and the UFCs and government criteria referenced therein. Use ETL 11-18 for specific indoor small arms firing range requirements.

4-2 STRUCTURE.

4-2.1 Foundation.

The foundation design and type is site specific and must be designed based on geotechnical recommendations provided by a licensed geotechnical engineer knowledgeable of the local conditions.

4-2.2 Superstructure.

Provide clear spans for the firing range and target systems. Use pre-engineered components for superstructure framing, where feasible. The superstructure must support the bullet deflector plates/baffle system and other equipment (e.g., bullet trap). Camber the roof framing for the firing range to remain flat under super-imposed dead loads.

Provide hardened ceilings for the arms/ammunition storage rooms.

A perimeter steel structure to support the roof framing and CMU or concrete walls may be used for ease of construction and local parameters.

The framing for the roof structure of the firing range may be one of the following two options:

- Roof joists spanning the full distance from the front to the back of the range with no intermediate supports. Do not span side to side because it limits expansion.

- Along the firing line (barricade) there may be steel columns (dividing the lanes) supporting steel girders spanning the width of the firing range. This line of girders could support open web bar joists spanning from the girder to the front wall (about 25 feet [7.6 meters]) on one side and to the back wall (about 115 feet [35 meters]) on the other side.
4-3 EXTERIOR DESIGN.

In general, the building’s image, theme, and fixtures must be consistent with the programs offered and the architecture established on base. Reflect the local geographical and cultural environment in the design and comply with AFCFS and installation architectural standards. Provide a visually attractive, safe, and welcoming appearance. Consider grouping high bay spaces together. Do not allow the building massing to dominate or overwhelm surrounding structures.

4-3.1 Entrances/Exits.

Entries into the firing range must be limited and secured for safety. Entries to the range are not to be provided downrange of the firing line. Provide warning lights to signal that live rounds are being fired within the range.

4-3.2 Doors and Windows.

Limit windows to the queuing room, classroom, administrative areas, break room, and corridor. Use aluminum or hollow metal frames and doors. Mitigate glare and direct sunlight in activity spaces.

4-4 INTERIOR DESIGN.

4-4.1 Interior Construction.

Personnel will be handling weapons that bump against walls and trim. Provide durable, low-maintenance construction materials and do not use hollow-core wood doors. All interior glass must be tempered safety glass and mirrors must be made of break-resistant materials.

Provide counters, casework, and cabinets of high-quality and durable construction. Provide countertops of solid surface/solid composite plastics only or stainless steel.

4-4.2 Finishes.

Provide finishes that are compatible with the intended uses and are highly durable and low maintenance. They must meet the requirements listed in NFPA 101. Also coordinate the interior design with the Air Force Interior Design Standards, major command and installation design standards, and ETL 07-4. Personnel with weapons and ammunition often bump and scrape walls, so provide heavy-duty, durable finishes.

Provide acoustical treatment to minimize sound reverberations and intensity within the indoor small arms firing range.

4-4.3 Window Treatments.

Include window treatments (shading systems) as an integral part of the construction contract in administrative areas. Dual fabric solar roller shade systems with manual roll
chain operation are recommended. Analyze solar conditions when selecting a window treatment. Window treatments must provide full coverage to reduce light leakage. Any window treatment must be flame-resistant and commercial quality.

4-5 SERVICES.

4-5.1 Plumbing.

Design domestic hot and cold water, sanitary and storm drainage, compressed air, propane, fuel oil, or natural gas systems to meet the requirements of UFC 3-420-01 and local installation standards.

The weapons maintenance and student weapons cleaning rooms shall each require emergency eyewash. Compressed air shall be provided in the student weapons cleaning room.

4-5.2 Heating, Ventilating, and Air Conditioning (HVAC).

Design the HVAC system to meet the requirements of UFC 3-410-01, ETL 04-3, and ETL 11-18.

The air supply system for the firing range must ensure a safe environment for participants by delivering air at the firing line and exhausting air at the target end. Air must travel in a laminar fashion at 75 fpm (±15 fpm) across the firing line to prevent powder residue from settling. Provide uniform, unidirectional laminar airflow across the firing line by installing a perforated air distribution plenum, radial plenum, or other distribution device along the rear wall. For energy conservation, do not heat or cool supply air to the range. However, for extremely cold environments, radiant heat may be provided above the firing platform. In extremely hot environments, active (refrigerated) or passive (evaporative) cooling systems capable of maintaining the spaces at or below an ASHRAE effective maximum temperature of 93 °F may be used. Exhaust air must be provided at the end of the indoor small arms firing range, behind the bullet trap, and shall maintain 3 to 7 percent negative pressure on the range. Exhaust fan controls must be interlocked with the supply fan to ensure simultaneous operation. Re-circulation of range air is not permitted and exhaust air discharge from the range and bullet trap shall meet local, state, and federal requirements. The range control booth shall maintain positive pressure relative to the indoor small arms firing range.

The HVAC system for the weapons cleaning area, ammunition storage area, and weapons maintenance area must be designed for safe operations with chemicals and munitions. Provide exhaust ventilation for the weapons maintenance shop, range supplies, student weapons cleaning room, laundry, janitor closet, and restrooms. Exhaust makeup air may be transferred from adjacent spaces (not from firing range), provided adequate ventilation is supplied to prevent negative air pressure in relation to the outside. Provide occupancy sensors to control all exhaust fans. Weapons and ammunition storage areas must maintain relative humidity below 65 percent.
4-5.3 Fire Protection and Life Safety.

Refer to UFC 1-200-01 to determine the applicable design codes and standards for all building and life safety features for the facility. UFC 1-200-01 references UFC 3-600-01 and will be utilized to determine the passive fire protection features of the facility, such as building height and area, construction type, egress limitations, etc., as well as the active fire protection features of the facility, including fire detection, fire alarm, fire suppression, etc.

ETL 11-18 provides specific Air Force design and construction criteria for small arms ranges and shall take precedence over all other design standards where conflicts exist for fire protection requirements.

4-5.4 Electrical.

Provide electric service and distribution equipment, wiring receptacles and grounding, interior and exterior lighting and control, emergency lighting, telephone, communication systems, fire alarm, other health and safety alarms, and intrusion systems in accordance with NFPA 70, UFC 3-520-01, ETL 11-18, and installation design requirements. Include a connection capability for a portable standby generator.

See the latest edition of *Electric Current Abroad* to determine voltages and cycles in overseas locations. Service grounding system and all wiring methods must meet current NFPA 70 requirements. All service equipment must be Underwriters Laboratories (UL) listed. Alternately, published proof from an approved independent testing laboratory may be provided.

4-5.4.1 Lighting.

Provide lighting and control systems throughout the facility in accordance with UFC 3-530-01 and ETL 11-18. Pay particular attention to issues such as glare, heat generation, and impact protection for the fixtures in the indoor small arms firing range. Provide a control system to highlight target lines at the 3, 7, 10, 15, and 25 meter lines and to simulate night or daylight.

Provide a flashing light system to simulate a police car light bar. Provide “range in use” warning lights.

4-5.4.2 Communications and Data.

Telephone and data outlets may be independent of each other or combined into a single junction box. Also consider wireless audio, video, and data installations to add flexibility. If the hard-wired connections can be combined into a single junction box then the cover plate to that junction box must allow for multiple connections. In some unique situations, the CATV/internal video connection can also be combined into a single junction box with the appropriate cover plate.
Identify the technical design requirements for the CCTV system with the base user and AFSFC.

4-5.4.3 Alarm Systems.

Provisions for alarm systems must be identified during the planning/programming process. Provide an alarm system to warn personnel that live fire is in progress and/or if any downrange doors are open. Provide an intrusion detection alarm system to protect vault arms and ammunition.

4-6 SITE DESIGN AND ORGANIZATION.

4-6.1 Parking and Access Drives.

Provide parking for both staff and patrons with the appropriate access drives. Consider bicycle racks near the facility entrance in a secure location. Refer to AFH 32-1084, paragraph 20.2.2.2, and note 1 of Table 20.2. For landscaping and site pavements refer to UFC 4-010-01, paragraph 4-8, for AT standoff distances and access road requirements.

4-6.2 Service Drive.

The size of required service vehicles should be verified by the designer prior to planning the service access areas. Provide a back-up spur for dead-end and service drives that exceed 100 feet (30 meters) in length for receiving area, garbage dumpster/storage (indoor or outdoor), mechanical room, and service entry, if one is designated. Provide a service vehicle apron and consolidate service access when possible.

4-6.3 General Site Lighting.

Provide exterior “range in use” flashing red indicator lighting as recommended by ETL 11-18 for facilities where night operations are possible.

4-7 BARRIER-FREE DESIGN REQUIREMENTS.

Refer to UFC 1-200-01 for barrier-free design requirements.

Indoor small arms firing range activities will be for able-bodied personnel only. Visitors with physical disabilities will be allowed as observers but not participants.

4-8 ANTITERRORISM.

Refer to UFC 4-020-01 for AT requirements. The firing range portion of the building may be classified as low occupancy due to the personnel density of more than 430 SF/PN, which would exempt the firing range from all UFC 4-010-01 provisions.
4-9 SUSTAINABLE DESIGN.

Comply with the requirements of UFC 1-200-02, *High Performance and Sustainable Building Requirements* and achieve green building certification in accordance with the current AF Sustainable Design and Development memo.
APPENDIX A REFERENCES

Use the latest available issuance of the reference

AIR FORCE


Air Force Corporate Facility Standards (AFCFS), http://afcfs.wbdg.org/index.html


http://www.wbdg.org/ccb/browse_cat.php?o=33&c=125

ETL 04-3, *Design Criteria for Prevention of Mold in Air Force Facilities*,
http://www.wbdg.org/ccb/browse_cat.php?o=33&c=125

ETL 07-4, *Air Force Carpet Standard*,
http://www.wbdg.org/ccb/browse_cat.php?o=33&c=125

ETL 11-18, *Small Arms Range Design and Construction*,
http://www.wbdg.org/ccb/browse_cat.php?o=33&c=125

AMERICAN CONCRETE INSTITUTE

ACI 301-10, *Specifications for Structural Concrete*,

ACI 318-14, *Building Code Requirements for Reinforced Concrete and Commentary*,

ACI 530.1-13, *Specifications for Masonry Structures*,

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

https://www.aisc.org/WorkArea/showcontent.aspx?id=39246
AMERICAN IRON AND STEEL INSTITUTE


AMERICAN SOCIETY OF CIVIL ENGINEERS


AMERICAN SOCIETY OF HEATING, REFRIGERATING, AND AIR-CONDITIONING ENGINEERS


AMERICAN WELDING SOCIETY

AWS D1.1/D1.1M, Structural Welding Code –Steel,

ARCHITECTURAL BARRIERS ACT


DEPARTMENT OF COMMERCE

DEPARTMENT OF DEFENSE

MIL-HDBK 1013/1A, Design Guidelines for Physical Security of Facilities,  

UFC 1-200-01, General Building Requirements,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 1-200-02, High Performance and Sustainability Building Requirements,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 1-300-07A, Design Build Technical Requirements,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-101-01, Architecture,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-110-03, Roofing,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-120-01, Design: Sign Standards,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-120-10, Interior Design,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-190-06, Protective Coatings and Paints,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-201-01, Civil Engineering,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-201-02, Landscape Architecture,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-210-10, Low Impact Development,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-220-01, Geotechnical Engineering,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-220-04FA, Backfill for Subsurface Structures,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-220-08FA, Engineering Use of Geotextiles,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-230-01, Water Storage, Distribution, and Transmission,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4

UFC 3-240-01, Wastewater Collection,  
http://www.wbdg.org/ccb/browse_cat.php?o=29&c=4


**ENERGY INDEPENDENCE AND SECURITY ACT**


**ENERGY POLICY ACT**

ENVIRONMENTAL PROTECTION AGENCY

National Pollutant Discharge Elimination System (NPDES) for Construction Activities (varies by state), http://water.epa.gov/polwaste/npdes/

FEDERAL HIGHWAY ADMINISTRATION


ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA


INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS


INTERNATIONAL CODE COUNCIL


International Mechanical Code (IMC), http://publicecodes.cyberregs.com/icod/imc/index.htm

International Plumbing Code (IPC), http://publicecodes.cyberregs.com/icod/ipc/index.htm

NATIONAL FIRE PROTECTION ASSOCIATION


**OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION**

Occupational Safety and Health Administration (OSHA) regulations, [https://www.osha.gov/law-regs.html](https://www.osha.gov/law-regs.html)

**US GREEN BUILDING COUNCIL**

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APPENDIX B BEST PRACTICES

B-1 U.S. AIR FORCE SECURITY FORCES INTERACTIVE PROGRAMMING SPREADSHEET.

The Interactive Programming Spreadsheet can be found on the Whole Building Design Guide website: http://www.wbdg.org/references/pa_dod_sps.php
### Figure B-1 Indoor Small Arms Range Facility (14 Lane – Standard)

#### Indoor Small Arms Range Facility (14 Lane - Standard)

<table>
<thead>
<tr>
<th>Module No.</th>
<th>Area</th>
<th>No. Occup.</th>
<th>SF Per User</th>
<th>No. of Rooms Req'd</th>
<th>Individual Room Requirements</th>
<th>Net User Requirements</th>
<th>Comments</th>
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</table>

### Comments:

1. Questioning area based upon 20 sq ft per occupant with additional 60 sq ft for Vestibule; Refer AFI 32-1084 Table 6.6 - Waiting and Vestibule
2. Break area based upon 20 sq ft per occupant; Arms Range to conduct simultaneous training
3. NCIOC Office area based upon Private office with up to two visitors; Refer AFI 32-1084 Table 6.2
4. Open Office area based upon 80 sq ft per occupant with additional 20 sq ft for administrative support; Refer AFI 32-1084 6.1.2.1, 6.1.2.3, and Table 6
5. Classroom / Weapons Simulator areas based upon specific requirements per AFSF
6. Observation Room area based upon 64 sq ft per occupant; Refer AFI 32-1084 Table 6.2.1
7. Weapons Maintenance Shop area based upon specific requirements per AFSF
8. Student Weapons Cleaning area based upon specific requirements per AFSF
9. Arms Range area based upon requirements set forth in UFC-215-01
10. Issue Room area based upon 12”-9” minimum depth for proper distribution and clearing of arms
11. Building Support areas may differ per climatic and systematic requirements
12. This facility has a low net to gross factor due to the square footage of the indoor small arms range
13. Net to Gross Area includes circulation, walls, and corridors
14. Arms Range Mechanical Yard and Exterior Canopy are covered exterior spaces and are calculated at 1/2 square foot
Table: Indoor Small Arms Range Facility (21 Lane – Standard)

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<th>MODULE NO.</th>
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<th>NO. OF ROOMS REQD</th>
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Comments:
1. Queuing area based upon 20 sq ft per occupant with additional 60 sq ft for Vestibule; Refer AFI 32-1084 Table 6.3 - Waiting and Vestibule
2. Break area based upon 20 sq ft per occupant; Arms Range to conduct simultaneous training
3. NCOIC Office area based upon Private office with up to two visitors; Refer AFI 32-1084 Table 6.2
4. Open Office area based upon 60 sq ft per occupant with additional 20 sq ft for administrative support; Refer AFI 32-1084 6.1.2.1, 6.1.2.3, and Table 6
5. Classroom / Weapons Simulator areas based upon specific requirements per AFSF
6. Observation Room area based upon 64 sq ft per occupant, Refer AFI 32-1084 Table 6.2.1
7. Weapons Maintenance Shop area based upon specific requirements per AFSF
8. Student Weapons Cleaning area based upon specific requirements per AFSF
9. Arms Range area based upon requirements set forth in UFC 4-215-01
10. Issue Room area based upon 12'-0" minimum depth for proper distribution and clearing of arms
11. Building Support areas may differ per climatic and system requirements
12. This facility has a low net to gross factor due to the square footage of the indoor small arms range
13. Net to Gross Area includes circulation, walls, and corridors
14. Arms Range Mechanical Yard and Exterior Canopy are covered exterior spaces and are calculated at 1/2 square footage
# Indoor Small Arms Range Facility (56 Lane)

<table>
<thead>
<tr>
<th>MODULE NO.</th>
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<th>NO. OCCUP</th>
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<tr>
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<td>56</td>
<td>20</td>
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<tr>
<td>A2</td>
<td>Break</td>
<td>56</td>
<td>20</td>
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<tr>
<td>A3</td>
<td>NCOIC Office</td>
<td>1</td>
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<td>1</td>
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<td>A4</td>
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<td>A5</td>
<td>Admin / Instructor Storage</td>
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**SUBTOTAL ADMINISTRATION AREA** 4140 384.61

|            | **B** Arms Range      |           |             |                   |                      | **SF** **SM**         | COMMENTS               |
|            | B1 Arms Range         | 14        | 1           | 1                 | 39700               | 39700                 | 3668.13                |
|            | B2 Range Supplies     | 0         | 1           | 1                 | 1600                | 1600                  | 146.64                 |

**SUBTOTAL ARMS RANGE AREA** 41300 3836.77

|            | **C** Training        |           |             |                   |                      | **SF** **SM**         | COMMENTS               |
|            | C1 Classroom           | 63        | 1           | 1                 | 2700                | 2700                  | 2508.93                |
|            | C2 Weapons Simulator  | 43        | 1           | 1                 | 2700                | 2700                  | 2508.93                |
|            | C3 Observation Room    | 2         | 1           | 1                 | 200                 | 200                   | 8                      |
|            | C4 Storage             | 0         | 1           | 1                 | 200                 | 200                   | 0                      |

**SUBTOTAL TRAINING AREA** 6600 613.18

|            | **D** Maintenance      |           |             |                   |                      | **SF** **SM**         | COMMENTS               |
|            | D1 Weapons Maintenance Shop | 3    | 1           | 1                 | 1200                | 1200                  | 1114.68                |

**SUBTOTAL MAINTENANCE AREA** 1200 1114.68

|            | **E** Cleaning         |           |             |                   |                      | **SF** **SM**         | COMMENTS               |
|            | E1 Student Weapons Cleaning | 63  | 1           | 1                 | 2500                | 2500                  | 2322.29                |

**SUBTOTAL CLEANING AREA** 2500 2322.29

|            | **F** Storage          |           |             |                   |                      | **SF** **SM**         | COMMENTS               |
|            | F1 Arms Vault          | 1         | 1           | 1                 | 900                 | 900                   | 83.61                  |
|            | F2 Issue Room          | 122       | 1           | 1                 | 700                 | 700                   | 65.09                  |

**SUBTOTAL STORAGE AREA** 1600 148.64

|            | **G** Utility          |           |             |                   |                      | **SF** **SM**         | COMMENTS               |
|            | G1 Restrooms / Locker Rooms | 0  | 1           | 1                 | 689                 | 689                   | 63.17                  |
|            | G2 Janitor's Closet    | 0         | 1           | 1                 | 45                  | 45                    | 4.18                   |
|            | G3 Laundry Room        | 0         | 1           | 1                 | 55                  | 55                    | 6.04                   |

**SUBTOTAL UTILITY AREA** 789 73.33

|            | **H** Building Support |           |             |                   |                      | **SF** **SM**         | COMMENTS               |
|            | H1 Mechanical          | 0         | 1           | 1                 | 4600                | 4600                  | 4273.91                |
|            | H2 Electrical          | 0         | 1           | 1                 | 300                 | 300                   | 27.82                  |
|            | H3 Telecommunications  | 0         | 1           | 1                 | 300                 | 300                   | 27.82                  |

**SUBTOTAL BUILDING SUPPORT AREA** 5200 483.91

|            | **FACILITY NET FLOOR AREA** | 65747.59  | 6111.64     |                     |                      | 10% 12,13            | COMMENTS               |
|            | **FACILITY GROSS AREA**    | 74348     | 6396        |                     |                      | 10% 12,13            |                       |

**COMMENTS:**
1. Queuing area based upon 20 sq ft per occupant with additional 60 sq ft for Vestibule. Refer AFI 32-1084 Table 6.3 - Waiting and Vestibule
2. Break area based upon 20 sq ft per occupant; Arms Range to conduct simultaneous training
3. NCOIC Office area based upon Private office with up to two visitors; Refer AFI 32-1084 Table 6.2
4. Open Office area based upon 80 sq ft per occupant with additional 20 sq ft for administrative support; Refer AFI 32-1084 6.1.2.1, 6.1.2.2, and Table 6.2
5. Classroom / Weapons Simulator areas based upon specific requirements per AFSF HQ
6. Observation Room area based upon 64 sq ft per occupant, Refer AFI 32-1084 Table 6.2.1
7. Weapons Maintenance Shop area based upon specific requirements per AFSF HQ
8. Student Weapons Cleaning area based upon specific requirements per AFSF HQ
9. Arms Range area based upon requirements set forth in UFC 4-215-01
10. Issue Room area based upon 12'-0" minimum depth for proper distribution and clearing of arms
11. Building Support areas may differ per climatic and systemic requirements
12. This facility has a low net to gross factor due to the square footage of the indoor small arms range
13. Net to Gross Area includes circulation, walls, and corridors
14. Arms Range Mechanical Yard and Exterior Canopy are covered exterior spaces and are calculated at 1/2 square footage
B-2 PDF FLOOR PLANS AND BIM DRAWING LINK.

The .pdf and BIM drawings can be found on the Whole Building Design Guide: http://www.wbdg.org/references/afbim_tools.php
APPENDIX C GLOSSARY

°F degrees Fahrenheit

ABA Architectural Barriers Act

ACI American Concrete Institute

ADP Area Development Plan

A-E architect-engineer

AFCFS Air Force Corporate Facilities Standards

AFH Air Force Handbook

AFI Air Force Instruction

AFMAN Air Force Manual

AFMAN Air Force Manual

AFSFC Air Force Security Force Center

AISC American Institute of Steel Construction

AISI American Iron and Steel Institute

ASCE American Society of Civil Engineers

ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning Engineers

ASTM American Society of Testing and Materials

AT antiterrorism

AWS American Welding Society

BIM Building Information Modeling

CATV cable television

CCTV closed-circuit television

CMU concrete masonry unit

DOD Department of Defense

EISA Energy Independence and Security Act
<table>
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>EM</td>
<td>Engineer Manual</td>
</tr>
<tr>
<td>ER</td>
<td>Engineer Regulation</td>
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<tr>
<td>ETL</td>
<td>Engineering Technical Letter</td>
</tr>
<tr>
<td>fc</td>
<td>foot-candle</td>
</tr>
<tr>
<td>fpm</td>
<td>feet per minute</td>
</tr>
<tr>
<td>GSA</td>
<td>General Services Administration</td>
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<tr>
<td>HVAC</td>
<td>heating, ventilating, air conditioning</td>
</tr>
<tr>
<td>IBC</td>
<td>International Building Code</td>
</tr>
<tr>
<td>IDP</td>
<td>Installation Development Plan</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>IENSA</td>
<td>Illuminating Engineering Society</td>
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<tr>
<td>IFC</td>
<td>International Fuel Gas Code</td>
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<tr>
<td>IMC</td>
<td>International Mechanical Code</td>
</tr>
<tr>
<td>IPC</td>
<td>International Plumbing Code</td>
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<tr>
<td>LAN</td>
<td>local area network</td>
</tr>
<tr>
<td>LED</td>
<td>light-emitting diode</td>
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<tr>
<td>LEED-NC</td>
<td>Leadership in Energy &amp; Environmental Design – New Construction</td>
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<tr>
<td>MIL-HDBK</td>
<td>Military Handbook</td>
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<tr>
<td>MUTCD</td>
<td>Manual on Uniform Traffic Control Devices</td>
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<tr>
<td>NCOIC</td>
<td>non-commissioned officer in charge</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Association</td>
</tr>
<tr>
<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration Regulations</td>
</tr>
<tr>
<td>PDF</td>
<td>Portable Document Format</td>
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<tr>
<td>RFP</td>
<td>request for proposal</td>
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<tr>
<td>Abb</td>
<td>Description</td>
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<td>-----</td>
<td>------------------------------</td>
</tr>
<tr>
<td>SF</td>
<td>square feet</td>
</tr>
<tr>
<td>STC</td>
<td>Sound Transmission Class</td>
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<tr>
<td>TI</td>
<td>Technical Instruction</td>
</tr>
<tr>
<td>UFC</td>
<td>Unified Facilities Criteria</td>
</tr>
<tr>
<td>USGBC</td>
<td>U.S. Green Building Council</td>
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<tr>
<td>V</td>
<td>volt</td>
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</table>
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FROM: HQ AFCESA/CEO
139 Barnes Drive, Suite 1
Tyndall AFB, FL 32403-5319


1. Purpose.

1.1. This ETL provides criteria for the design and construction of Air Force small arms ranges and applies to both new construction and major renovations. Additionally, this ETL should be used as a guide for any ranges purchased as equipment items. The intent of this ETL is to provide the minimum design criteria necessary for achieving a safe range design. This ETL assumes users have a formal engineering education and background or access to local engineering expertise. This ETL does not establish the number of firing points, target distance, targetry, or type of range. A planning team composed of major command (MAJCOM) and installation-level combat arms (CA), civil engineering (CE), bioenvironmental engineer (BEE) and safety (SE) personnel will jointly establish the number of firing points, the target distance, and the type of range based on mission, training requirements, and available real estate.

1.2. This ETL is directive in accordance with Air Force instruction (AFI) 32-1023, Designing and Constructing Military Construction Projects, and AFI 36-2226, Combat Arms Program, and must be used by the range designer when designing a new range or renovating an existing range. The range designer has the responsibility to ensure the minimum criteria presented in this ETL are used to provide a safe range design. This ETL may not cover all site-specific concerns and it is the designer's responsibility to adapt the intent of the ETL criteria to ensure the range is operationally safe. This ETL is not a specification or a prescriptive checklist and is not intended to replace professional judgment by a competent licensed professional engineer, after coordination with the end-user or installation CA section. Additionally, nothing in this ETL should preclude consideration and use of emerging technologies and commercially available products if these can be proven to result in a safe and satisfactory range design.

1.3. This ETL supersedes ETL 08-11, Small Arms Range Design and Construction.

Note: The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this ETL does not imply endorsement by the Air Force.
2. **Summary of Revisions.** This ETL is revised as a result of a 2010 air ventilation survey. The primary change to this ETL eliminates the design of new, fully contained outdoor ranges. The reason for eliminating this option is because controlling air flow within the range is virtually impossible with an open roof over the baffles. With this new ETL only two options remain: fully contained indoor range or non-contained range, for design and major renovation of small arms ranges. Range ventilation performance will also need to be validated prior to final inspection to ensure that proper ventilation is provided within the range. This ETL also allows for expanded use of noise-reduction material to improve occupational exposure to high noise levels.

3. **Application:** All Air Force installations.
   - The criteria in this ETL shall apply to all small arms ranges where the design phase is 35 percent complete or less on the effective date of this ETL.
   - New partially contained ranges or fully contained outdoor ranges will not be designed or constructed. If planned major range or component repairs of an existing range will cost more than 50 percent of the estimated range replacement cost (plant replacement value), the entire facility must be upgraded to comply with this ETL.
   - The salient safety, health, and environmental features of permanent ranges shall apply to expeditionary or portable ranges; therefore, these ETL standards shall apply to portable ranges purchased as equipment.
   - The requirements in this ETL are applicable in OCONUS locations. When conflicts exist between this ETL and host nation requirements, the strictest requirement shall apply.
   - After MAJCOM approval, HQ AFSFC/SFXW may approve deviations from the criteria in this ETL. MAJCOMs will submit requests for deviation to HQ AFSFC/SFXW, who will coordinate with HQ AFCESA and AFMSA for review.

3.1. **Authority:** Air Force policy directive (AFPD) 32-10, *Installations and Facilities*.

3.2. **Effective date:** Immediately.

3.3. **Intended Users:** MAJCOM functional managers; CE; BEE; CA, and range designers for the Air Force.

3.4. **Coordination:** MAJCOM functional managers and HQ AFSFC/SFXW.

4. **Referenced Publications.** In some instances, the references listed in paragraphs 4.1 through 4.7 may advocate procedures that seem to contradict those in this ETL. In these cases, the information in this ETL supersedes any other design and construction source. Likewise, policy guidance on range operation and maintenance contained in AFI 36-2226 takes precedence over other sources.
4.1. Public Law:

4.2. Department of Defense (DOD):

- AFPD 32-10, *Installations and Facilities*
- AFI 32-1023, *Designing and Constructing Military Construction Projects*
- AFI 36-2226, *Combat Arms Program*
- AFI 90-901, *Operational Risk Management*
- Air Force pamphlet (AFPAM) 90-902, *Operational Risk Management (ORM) Guidelines and Tools*
- Air Force Occupational Safety and Health (AFOSH) Standard 48-20, *Occupational Noise and Hearing Conservation Program*
- Air Force manual (AFMAN) 48-155, *Occupational and Environmental Health Exposure Controls*

4.4. Navy:

4.5. Army:
• Training Circular (TC) 25-8, *Training Ranges*,
  http://armypubs.army.mil/doctrine/tc _1.html
• National Guard Bureau Regulation (NGR) 385-15, *Policy and Responsibilities for Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges*,

4.6. Environmental Protection Agency (EPA):
• *Best Management Practices for Lead at Outdoor Shooting Ranges*,
  http://www.epa.gov/region02/waste/leadshot/

4.7. Industry:
• American Welding Society (AWS) D1.1, *Structural Welding Code – Steel*,
  https://www.awspubs.com
• ASTM A514/A514M, *Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding*,
  http://www.astm.org

5. Acronyms and Symbols.

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<tr>
<th>Acronym</th>
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<tr>
<td>AFCESA</td>
<td>Air Force Civil Engineer Support Agency</td>
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<td>AFMAN</td>
<td>Air Force manual</td>
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<tr>
<td>AFH</td>
<td>Air Force handbook</td>
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<tr>
<td>AFI</td>
<td>Air Force instruction</td>
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<td>AFMSA/SG3PB</td>
<td>Air Force Medical Support Agency, Bioenvironmental Engineering Division</td>
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<td>AFOSH</td>
<td>Air Force Occupational Safety &amp; Health</td>
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<td>AFPAM</td>
<td>Air Force pamphlet</td>
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<td>Air Force policy directive</td>
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<td>AR</td>
<td>Abrasion resistant (e.g., AR500 plate)</td>
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<td>American Welding Society</td>
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<td>BCE</td>
<td>Base civil engineer</td>
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<td>Bioenvironmental engineering (office)</td>
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<td>Bioenvironmental engineer</td>
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<td>BHN</td>
<td>Brinnell Hardness Number</td>
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<td>BMP</td>
<td>Best management practices</td>
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<td>Combat arms</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>cal.</td>
<td>caliber</td>
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<tr>
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<td>civil engineering</td>
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<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CMU</td>
<td>concrete masonry unit</td>
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<tr>
<td>dBA</td>
<td>decibels (“A” scale)</td>
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<td>DOD</td>
<td>Department of Defense</td>
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<td>DODD</td>
<td>Department of Defense Directive</td>
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<td>DODI</td>
<td>Department of Defense Instruction</td>
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<td>explosive ordnance disposal</td>
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<td>foot</td>
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<tr>
<td>HEPA</td>
<td>high-efficiency particulate air (filter)</td>
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<td>HMMWV</td>
<td>high-mobility multi-purpose wheeled vehicle</td>
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<td>HQ AFCESA/CEOA</td>
<td>Headquarters Air Force Civil Engineer Support Agency, Engineer and Programs Support Division, Engineer Support Branch</td>
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<tr>
<td>HQ AFSFC/SFXW</td>
<td>Headquarters, Air Force Security Forces Center, Combat Arms</td>
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<td>heating, ventilation, and air conditioning</td>
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<td>IESNA</td>
<td>Illuminating Engineering Society of North America</td>
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<td>in.</td>
<td>inch</td>
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<tr>
<td>LAW</td>
<td>light anti-tank weapon</td>
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<tr>
<td>LR</td>
<td>long rifle</td>
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<tr>
<td>m</td>
<td>meter</td>
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<td>mpm</td>
<td>meters per minute</td>
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<td>NCOIC</td>
<td>noncommissioned officer in charge</td>
</tr>
<tr>
<td>NEHC</td>
<td>Navy Environmental Health Center</td>
</tr>
<tr>
<td>NMCPHC</td>
<td>Navy and Marine Corps Public Health Center</td>
</tr>
<tr>
<td>OCONUS</td>
<td>outside continental United States</td>
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<tr>
<td>ORM</td>
<td>operational risk management</td>
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<tr>
<td>PEL</td>
<td>permissible exposure limit</td>
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<tr>
<td>pH</td>
<td>symbol for logarithm of reciprocal of hydrogen ion concentration in gram atoms per liter</td>
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<tr>
<td>PPBE</td>
<td>planning, programming, budgeting, and execution</td>
</tr>
<tr>
<td>psi</td>
<td>pound per square inch</td>
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<td>RH</td>
<td>relative humidity</td>
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<tr>
<td>RKT HEAT</td>
<td>rocket high-explosive anti-tank</td>
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<td>SDZ</td>
<td>surface danger zone</td>
</tr>
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<td>safety</td>
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6. Definitions.

6.1. Small arms range: A live-fire training facility for training and certifying personnel in the use of handguns, shotguns, rifles up to 7.62mm, rifles or machine guns up to .50 caliber, and the MK-19 40mm machine gun. A small arms range may include special ranges for 40mm grenade launchers, light anti-tank weapons (LAW), and 81mm mortars. Equipment items such as fully (self-) contained portable or expeditionary ranges fall into this category.

6.2. Surface danger zone (SDZ): The portions of the range in the horizontal plane that are endangered by firing a particular weapon. The SDZ includes the area between the firing line and the target line, an impact area, a ricochet trajectory area, and a secondary danger area. The SDZ may also include a weapon back-blast area. The SDZ must be located completely within the boundaries of U.S. government-owned or -leased properties. A fully contained range which is incapable of allowing a fired projectile to escape its limits does not have an exterior SDZ.

6.3. Vertical danger zone (VDZ): For non-contained and partially contained ranges, the VDZ is the volume of airspace above the SDZ between the ground surface and the maximum ordinate of a direct-fired or ricochet round. The height of the VDZ varies with the weapon and ammunition fired (see Attachment 1). For fully contained ranges, the VDZ is the area between the SDZ and the upper limits of containment.

6.4. Non-contained range (impact range): A non-contained range is an outdoor/open range. The firing line may be covered or uncovered. Direct-fire rounds and ricochets are unimpeded and may fall anywhere within the SDZ. The non-contained range requires an SDZ equal to 100 percent of the maximum range of the most powerful round to be used on the range. This type of range requires the largest amount of real estate to satisfy the SDZ requirements.

6.5. Partially contained range: This range has a covered firing line, side containment, overhead baffles, and a bullet backstop. Direct fire is totally contained by the firing line canopy, side containment, baffles, and bullet trap (no “blue sky” observed from firing positions). Ricochets are not totally contained, but reduced by the baffles and side containment. A partially contained range requires an SDZ length equal to 50 percent of the maximum range of the most powerful round to be used on the range. A partially contained range will not permit lateral movement along the firing line or movement toward the target line unless the range has the additional baffles required to stop direct fire at the downrange firing lines.
6.6. **Fully contained range**: Range in which direct fire and ricochets are totally contained within the limits of the range. There is no SDZ requirement outside the limits of the containment.

7. **Design Criteria.** Range design is based on providing facilities that meet the needs of the training courses of fire specified by HQ AFSFC/SFXW and MAJCOMs based on mission needs. Future range designs must consider courses of fire that may differ from traditional “line-up-and-shoot” courses of fire: certain courses of fire may require the shooter to advance downrange toward the target; other scenarios may include driving a vehicle (HMMWV [“Humvee”] without pedestal-mounted weapon) into the range to practice vehicle dismount, cover techniques, and target engagement. It is imperative that a range designer fully understand what types of training and courses of fire will take place on the range and design the range accordingly. The designer should also consider design flexibility that allows for changing courses of fire in the future. Facility design and construction must comply with UFC 1-200-01, *General Building Requirements*.

Air Force ranges will not be designed or constructed to only accommodate frangible ammunition. To ensure operational range safety is not compromised, existing ranges that do not have the required SDZ may restrict the range to frangible ammunition only. However, this must be a temporary work-around and the owning organization must program corrective action to permit firing of ball ammunition.

The goal of the new Air Force small arms training philosophy is to increase the current 25-meter standard target distance and expand the diversity of training that can be accomplished on the range. Ranges should be designed to allow the greatest target distance possible within the available land at the site (e.g., 50 meters, 100 meters, 300 meters, 1000 meters). The desired target distance is at or as close as possible to the sight zero distance for the weapon.

Base and MAJCOM CA, CE, BE, and SE offices will jointly develop site-specific designs using the minimum criteria outlined in this ETL. MAJCOMs may submit designs that deviate from the requirements of this ETL to HQ AFSFC/SFXW for review. HQ AFSFC/SFXW will coordinate with HQ AFCESA/CEO, Engineer Support Branch, and AFMSA/SG3PB, Bioenvironmental Engineering Division, for review. Submit designs to HQ AFSFC only after MAJCOM approval. Individual MAJCOMs may establish design criteria exceeding the minimums specified in this ETL.

7.1. **Range Types, Combination Ranges, Range Configuration, Site Selection, and Range Geometric Design.**

7.1.1. **Range Types.**

7.1.1.1. Non-contained Range (Impact Range). The non-contained range accommodates the controlled and supervised discharge of weapons and has
sufficient land area to ensure the discharged projectile does not exit the SDZ. The trajectory of the projectile is along the line of fire (orientation of the range) and the impact of the projectile is designed to be within the limits of the impact area. The firing line may be covered or uncovered. Typically, there are no overhead baffles, but surface barriers or sidewalls may be provided to partially limit projectile trajectory. A non-contained range must have the land area to accommodate both the full SDZ and the full VDZ. Ammunition used on the range will establish the required length of the SDZ and the required height of the VDZ. SDZ length must be equal to the longest distance equal to 100 percent of the extreme range for the types of ammunition used on the range. The required SDZ must equal or exceed the minimum SDZ lengths listed in Table 1. For minimum VDZ height requirements, see Attachment 1.

Table 1. Minimum SDZ Distance Requirements for Small Arms Ammunition — Non-contained Range

<table>
<thead>
<tr>
<th>Weapon/Caliber</th>
<th>Ammunition</th>
<th>Minimum SDZ Length Meters (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handgun, 9mm pistol Submachine gun, 9mm</td>
<td>M882</td>
<td>1840 (6036)</td>
</tr>
<tr>
<td>Handgun, 9mm pistol</td>
<td>Frangible, lead-free, Winchester AA16</td>
<td>1584 (5196)</td>
</tr>
<tr>
<td>Handgun, .44 magnum</td>
<td>Commercial local purchase</td>
<td>2290 (7513)</td>
</tr>
<tr>
<td>Shotgun, 12 gauge</td>
<td>00 buckshot</td>
<td>600 (1968)</td>
</tr>
<tr>
<td>Rifle, 5.56mm</td>
<td>Ball M193; tracer M196</td>
<td>3100 (10,170)</td>
</tr>
<tr>
<td>Rifle, 5.56mm</td>
<td>Ball M855; tracer M856</td>
<td>3600 (11,811)</td>
</tr>
<tr>
<td>Rifle, 5.56mm</td>
<td>M862 (plastic)</td>
<td>250 (820)</td>
</tr>
<tr>
<td>Rifle, 5.56mm</td>
<td>Frangible, lead-free, Federal Cartridge BC556NT1, PSPCL and Winchester AA40</td>
<td>2750 (9022)</td>
</tr>
<tr>
<td>Rifle/machine gun, 7.62mm</td>
<td>Ball M80; tracer M81</td>
<td>4300 (14,107)</td>
</tr>
<tr>
<td>Rifle/machine gun, 7.62mm</td>
<td>Match M118</td>
<td>4800 (15,748)</td>
</tr>
<tr>
<td>Machine gun, .50 caliber</td>
<td>Ball M2 and M33/tracer M17/M8 API/M20 APIT</td>
<td>6700 (21,981)</td>
</tr>
<tr>
<td>M79, M203, 40mm low-velocity</td>
<td>M781/M407A1/M406/ M433/M381/M386/M441</td>
<td>500 (1640)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100* (328*)</td>
</tr>
<tr>
<td>MK-19, 40mm high-velocity</td>
<td>M918/M383/M430</td>
<td>2650 (8694)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>350* (1148*)</td>
</tr>
<tr>
<td>M72 LAW, 35mm sub-caliber</td>
<td>M73</td>
<td>1300 (4265)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100* (328*)</td>
</tr>
<tr>
<td>Weapon/Caliber</td>
<td>Ammunition</td>
<td>Minimum SDZ Length Meters (Feet)</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>M72 LAW, 66mm RKT HEAT</td>
<td>M72</td>
<td>1250 (4101) 250* (820*)</td>
</tr>
<tr>
<td>AT-4, 84mm RKT HEAT</td>
<td>M136</td>
<td>2600 (8530) 200* (656*)</td>
</tr>
</tbody>
</table>

*Additional standoff distance that must be added to minimum SDZ length to allow for explosive ordnance disposal (EOD) make-safe procedure.

7.1.1.2. Fully Contained Range. A fully contained range is designed to prevent 100 percent of the direct-fired rounds and 100 percent of the ricochets from leaving the limits of the range. This type of range is used when the required minimum SDZ or VDZ requirements are not available because of lack of land area or compatible land use. These ranges have an overhead containment structure (ballistic safety baffles) and sidewalls. The building envelope is typically not designed to prevent projectile penetration unless it is part of the containment. The structure elements and materials used for the building roof may vary depending upon the type and configuration of interior overhead containment, type of backstop, and method used to trap bullets. The fully contained range design must preclude the escape of both direct-fired projectiles and ricochets. Construct the overhead baffles with a minimum of 150 millimeters (6 inches) of horizontal overlap between the trailing edge of any baffle and the leading edge of the next baffle downrange (see Figure 8). The range design must include engineering controls to mitigate hazardous noise and other occupational and environmental hazards resulting from the use of both lead and non-lead frangible ammunition. For example, ammunition residue may contain unburned propellant. Excess build-up of this residue has caused flammable hazards within ranges. This flammability hazard may be controlled using a combination of facility and operational procedures to eliminate the risk of fire. Range personnel must work with local agencies to determine the required frequencies and procedures for removing unburned propellant from the range.

7.1.1.2.1. Fully Contained Indoor Range. A fully contained indoor range has a firing platform, bullet trap, and baffle system (or other ballistic containment system) enclosed within a complete building envelope. The complete building envelope is required to prevent influences from the exterior environment and to allow a slight negative pressure to be maintained within the range.

7.1.1.2.2. Fully Contained Outdoor Range. A fully contained outdoor range has baffle systems exposed to the environment and does not have a complete building envelope enclosing the entire range. Fully contained outdoor ranges are not permitted for new construction unless specifically approved by HQ AFSFC, HQ AFCESA, and AFMSA. All existing fully contained outdoor ranges designed in accordance with previously
published criteria may continue to operate if range safety can be verified. If an existing fully contained outdoor range does not meet the mechanical air flow requirement of paragraph 7.2.8.1, at the firing platform only, the installation shall program a project to provide the required airflow.

7.1.1.3. Partially Contained Range.

7.1.1.3.1. Partially contained ranges are not permitted for new construction unless specifically approved by HQ AFSFC, HQ AFCESA, and AFMSA. There are many existing partially contained ranges in the Air Force inventory.

7.1.1.3.2. All existing partially contained ranges that do not have the required SDZ must be programmed for upgrade or replacement to meet either full-distance, non-contained range criteria, fully contained range criteria, or the footprint of the existing deficient SDZ must be increased to meet the 50 percent SDZ requirement for a partially contained range. Existing partially contained ranges and other facilities designed in accordance with previously published criteria may continue to operate if range safety can be verified. Existing partially contained ranges that have an enclosed firing platform with sidewalls and back wall shall remove the sidewalls and back wall to improve natural ventilation.

- Verify range safety using the operational risk management (ORM) analysis in accordance with AFI 90-901, Operational Risk Management. See Attachment 2 for an ORM example.
- Range computer modeling and simulation is a proven technique for analyzing range safety and identifying necessary improvements.

Range safety violations and unsafe operating conditions must be addressed and corrected as soon as they are identified.

7.1.2. Combination Ranges. Range designs may be configured to accommodate a variety of weapons and courses of fire. The appropriate configuration must be determined by the types and sequence of weapons used.

7.1.2.1. Multi-purpose Ranges. The multi-purpose range provides for simultaneously firing more than one type of weapon. The complex consists of adjacent baffled and/or impact bays. A sidewall separates the two range types to prevent bullets from one range from entering the adjacent range.

7.1.2.2. Superimposed Ranges. A superimposed range accommodates different types of weapons and may be either a non-contained (impact) range or a fully contained (baffled) range; however, only one type of weapon may be fired at one time. The superimposed range allows for the maximum use of
land area and is usually the least expensive since there are no sidewalls between firing positions.

7.1.2.3. Special Ranges. Typically, special ranges are non-contained ranges designed to accommodate multiple target lines or arrays and set up for special types of weapons or unique courses of fire. Certain special ranges may exceed the scope of this ETL. Contact HQ AFSFC and HQ AFCESA for additional guidance.

7.1.3. Range Configuration. The range type, size, and configuration are based upon the installation mission, land availability, Air Force and MAJCOM policy, installation population, annual training requirements, and weapon-specific training requirements. Base CA personnel will submit their requirements for ranges through their chain of command to the MAJCOM functional manager. After the MAJCOM has validated the need, the BCE will begin a feasibility study for the proposed range. Programming and budgeting for range construction must occur within the framework of the normal planning, programming, budgeting and execution (PPBE) process.

7.1.4. Site Selection.

7.1.4.1. BCE. The BCE will identify the available real estate for the site of a small arms range facility that is consistent with the installation’s master plan. The installation master plan will indicate the range location, orientation, SDZ, and VDZ.

7.1.4.2. Planning. A project team composed of the CA non-commissioned officer in charge (NCOIC), a land use planner, CE, SE, and BE representatives should collectively review the proposed range usage and location for land use compatibility. Safety is the primary concern when determining the site for a small arms range. Orient the SDZ and VDZ to minimize the effect of range operations on populated areas, aircraft ground and air operations, and land uses within the travel distance of the ammunition. Where full-containment enclosures have not been provided, the project team should assume that ricochets would land in all portions of the SDZ. The BCE is responsible for plotting the SDZ and the VDZ on the base master plan. Mitigate any conflicts of land use or airspace operations with the SDZ or the VDZ as part of the PPBE process.

7.1.4.3. Real Estate Acquisition. When government-owned property suitable for a small arms range is not available, and where land acquisition is feasible, the BCE will prepare the documents required for purchase or lease.

7.1.4.4. Geographical, Environmental, and Climatic Effects.
7.1.4.4.1. If possible, the outdoor non-contained range should be oriented north-to-south to minimize glare. To minimize residue being blown back towards the shooter, site the non-contained range with the prevailing wind blowing from the shooter’s back toward the target line. For existing outdoor non-contained and outdoor partially contained ranges, supplemental ventilation may be required if natural air flow is not adequate to remove contaminated air from the firing line area. Seek assistance from the local BEE when assessing the air quality at existing firing platform areas. Avoid locating the range upwind of residential or populated areas. Site non-contained ranges and their impact areas to minimize projectiles and projectile residue falling in wetlands or waterways.

7.1.4.4.2. Regions subject to snow accumulation and extended periods of continuous sub-freezing temperatures should have fully contained indoor ranges. When this is not possible, the non-contained range should be sited to minimize drifting snow, ice buildup, and excess water, and to facilitate snow removal inside the range periphery.

7.1.4.4.3. Range sites must consider environmental concerns such as storm water management, protection of wetlands, ground and surface waters, historical or archaeological features, previously contaminated sites, and other concerns as may be determined by federal, state, and local environmental laws.

7.1.5. Range Geometric Design. The layout and dimensions of the facility must satisfy safety requirements and user needs. The following criteria are minimums:

7.1.5.1. SDZ Geometry. The range danger zone includes the projectile impact area, the SDZ, and the VDZ. Refer to Figures 1 through 6 for the typical geometry of the SDZ. The VDZ reflects the geometry of the SDZ extended to the VDZ height.

7.1.5.2. Limits of Fire. The limits of fire are imaginary lines drawn from the outermost edges of the endmost firing positions, extended downrange through the target line and terminating at the SDZ limit. The limits of fire may be perpendicular to the firing line or they may depart the firing line at a designated angle. The range’s configuration and use determines the departure angle of the limits of fire.

7.1.5.3. Projectile Impact Area or Direct Fire Zone. The projectile impact area is bounded by the left and right limits of fire, the firing line, and extends to the minimum SDZ arc length for the ammunition and range type (Table 1). When the target line and the firing line are the same width, the impact area forms a rectangle (Figure 1). When the target line is wider than the firing line, the impact area becomes a pie-shaped area formed by the limits of fire and the arc of the minimum SDZ length (Figure 2).
7.1.5.4. Ricochet Danger Area. The ricochet danger area is the area between the impact area and the secondary danger area. The ricochet area is typically determined by extending a line drawn at a 10 degree angle off the left and right limits of fire, beginning at the firing line and extending to the minimum SDZ arc (Figures 1, 2, and 3). For a LAW range (Figure 4), the ricochet area is drawn at a 13 degree angle.

7.1.5.5. Secondary Danger Areas. Secondary danger areas are provided to catch fragments from exploding ammunition or ricochets from rounds that impact at the outer edge of the ricochet danger area. A line beginning at the intersection of the firing line and the firing limits is drawn departing from the line of fire at an angle of 40 degrees, extending outward for 1,000 meters (3,280 feet). From the 1,000-meter point, a second line extends to a point on the minimum SDZ arc 100 meters (328 feet) outside the ricochet area limits.
Figure 1. SDZ Configuration — Firing Line Width Equal to Target Line Width
Figure 2. SDZ Configuration — Target Line Wider Than Firing Line
NOTES

1. Additional firing positions may be added provided minimum of 6 m (19 ft) is maintained.
2. Provide a 100-m (328-ft) clear zone (Areas A and B) around the perimeter of the range for EOD disposal of dud rounds with explosive type projectiles.
3. Ranges only certified for use of M781 or other inert projectile rounds are not required to include the 100-m (328-ft) space (Area A) to the left and right of the firing positions.

Figure 3. SDZ Configuration — M79 and M203 Grenade Launcher Range
Figure 4. SDZ Configuration — Light Anti-Tank Weapon (LAW) Range

7.1.5.6. SDZ for Frangible Ammunition. On existing ranges that do not have the required SDZ, the use of frangible ammunition may mitigate the lack of SDZ and allow the ranges to continue to operate safely. This may only be used as a temporary measure and the owning unit must program for corrective action to allow firing of full-power ball ammunition. The SDZs depicted in Figures 5 and 6 are based on firing from the firing line only; down-range firing training operations shall not be used unless a projectile trajectory analysis is performed.
7.1.5.6.1. For an existing 25-meter (82-foot) partially contained range with earth side berms and an earth backstop, the required SDZ when using frangible ammunition is 300 yards (274 meters). See Figure 5.

Figure 5. SDZ Requirement for Frangible Ammunition on a 25-Meter (82-Foot) Partially Contained Range with Earth Side Berms and Earth Backstop

7.1.5.6.2. For an existing 25-meter (82-foot) partially contained range with sidewalls of concrete or concrete block, overhead ballistic baffles (angled or vertical), and a bullet trap, the required SDZ when using frangible ammunition is 100 meters (328 feet). See Figure 6.
7.1.5.7. Firing Line Positions/Platforms. The number of firing positions establishes the width of the firing line. All small arms (rifle, pistol, and shotgun) ranges must have a minimum of fourteen positions on the firing line. Add additional positions in increments of seven firing positions. The width of the firing positions must be at least 1.52 meters (5 feet) center-to-center. The firing line must be located on a stable horizontal surface that is at least 4.3 meters (14 feet) wide, clear distance, for the length of the firing line. For most ranges, the firing platform is a concrete slab on grade. For non-contained ranges that have fighting positions dug in the ground, sandbags, or other definite structures to identify the firing line, the firing platform can be an earth surface. For special weapons, CA personnel will specify the number of firing positions and the widths of each position based upon training requirements.

7.1.5.7.1. Position Numbering. Each firing position will be numbered beginning from the left when facing the target line. The numbers must be at least 200 millimeters (8 inches) tall and displayed on rectangular backgrounds attached to the position barricade or other location that is clearly visible to all shooters and range officials. Odd-numbered positions will be marked with white numbers on a black background; even-numbered positions will be marked with black numbers on a white background.
7.1.5.7.2. Position Barricades. A wooden barricade in the form of a cross (+) must be installed at the left edge of each firing position. The minimum nominal dimensions of the wood must be 50 millimeters (2 inches) by 150 millimeters (6 inches). The top surface of the horizontal member must be 1220 millimeters (48 inches) above the platform.

7.1.5.7.3. Firing Line. Paint a red line a minimum of 100 millimeters (4 inches) wide on the leading edge of the firing platform on the target side. For non-contained ranges without concrete firing line platforms, a firing line will be marked definitively in red on the downrange side of the firing positions; examples include treated timber embedded along the firing line and painted red, or a line of safety cones. This is the stationary firing line and must be continuous for the full length of all the firing positions. For move-and-shoot courses of fire, the firing line is relocated down range as appropriate for the training scenario.

7.1.5.8. Ready Line. Paint a yellow line 100 millimeters (4 inches) wide on the firing line platform at least 2.4 meters (8 feet) behind the firing line (towards the rear of the firing platform). The line must be continuous for the length of the firing platform.

7.1.5.9. Target Line. Targets are placed along the target line, which runs parallel to the firing line. Targets are placed opposite and aligned with each firing position.

7.1.5.10. Target Line Configuration.

7.1.5.10.1. The distance from the firing line to the target line must be the same for all firing positions. Targets may be placed on turning, pop-up, or stationary mechanisms, or target-retrieval systems along the target line. Ensure that the line of sight from the firing line to the target line is clear and structural members, baffles, walls, or improper lighting do not obstruct the shooter’s sight picture from any firing position the shooters will use (e.g., prone, kneeling, left barricade, right barricade). Number each target location the same as its corresponding firing position. On non-contained ranges, the target line may be fixed and several firing lines constructed to permit firing at reduced distances. When this option is used, only the rear-most firing line will incorporate a firing platform. If the range has an earthen backstop, ensure there is sufficient distance between the closest firing line and the earthen backstop to eliminate the possibility of backspatter and ricochets affecting the shooter. For manufactured bullet traps, ensure there is 15 meters (49 feet) between the closest firing line and the bullet trap.

7.1.5.10.2. The center of the target must be located between the upper limit of fire (standing position), which is 1500 millimeters (60 inches) above
the firing line, and the lower limit of fire (prone position), which is 150 millimeters (6 inches) above the firing platform. The entire target face must be fully displayed to the firing position when exposed to the shooter for engagement.

7.2. Criteria Applicable to All Ranges. Design all range components (including ballistic safety structures and deflector plates) to satisfy the requirements for the weapon and ball ammunition used on the range. Except for non-contained ranges, ballistic safety structures are required for firing ranges. Ballistic safety structures include baffles, side containment, and backstops. Baffles are safety structures classified as canopy baffles or overhead baffles. Side containment is provided by sidewalls, berms, or discontinuous side baffles. A backstop is an impact berm or bullet trap designed to stop direct-fired rounds. See paragraph 7.5 for more detailed descriptions of ballistic safety structures.

7.2.1. Construction Materials. The materials selected for range construction must achieve the longest life-cycle possible, considering frequency of use, budget constraints, or other concerns. The desired life expectancy of permanent small arms range construction is 20 years. Permanent construction does not include protective construction, baffles, or sacrificial materials intended to capture projectiles. Evaluate alternative range design options using a life-cycle cost composed of the initial costs plus all operation and maintenance (O&M) costs for the first five years of range operation. Using the proper materials for sidewalls, baffles, overhead containment, bullet traps, and other areas where a projectile could impact will ensure that the bullet is deflected downrange and not towards the firing line. Ricochet control must be considered when positioning brackets used for baffles, locating bolt heads, and selecting protective construction.

7.2.2. Horizontal and Vertical Control. Establish vertical control by assuming the firing platform surface is equal to elevation 0.0 meter. The firing line is the baseline for horizontal control.

7.2.3. Drains. On outdoor ranges, use positive grading to direct water away from the firing line and toward the target line. When the length of the slope or the natural terrain requires using drains between the target and the firing line, a trench drain should be located at the forward edge of the bullet trap. If a trench drain is installed, the bullet trap should extend into the trench drain to eliminate any exposed edges that may cause unpredictable ricochets. Use grade breaks to prevent exposing vertical surfaces to the firing line. Do not route storm water runoff from any range floor to a stream, pond, or other body of surface water. In some circumstances, if the range is located near a surface water body, it may be necessary to incorporate detention basins or flow-through sand or peat filters to prevent particulate heavy metals that may be present in storm water runoff from reaching surface water bodies. Indoor ranges will not have floor drains downrange of the firing line. See the EPA’s Best Management Practices for Lead at Outdoor Shooting Ranges for additional guidance.
7.2.4. Range Occupational Health Standards. Design the range to control contaminants produced at the muzzle and ejection port of the weapon, bullet trap, and from the ventilation exhaust to ensure compliance with local, state, and federal regulations. Review NMCPHC-TM IH 6290.10, *Indoor Firing Ranges Industrial Hygiene Technical Guide*, and the EPA’s *Best Management Practices for Lead at Outdoor Shooting Ranges*. Additionally, the designer must coordinate with SE and BEE for additional requirements to ensure compliance with current policy.

7.2.5. Floor Surfaces. Fully contained indoor ranges must have a smooth, steel-trowel-finished concrete floor extending from the firing line to the bullet trap. Concrete used in floor construction shall have a minimum compressive strength of 3500 pounds per square inch (psi). The concrete floor should not be painted and must be protected with a waterproof sealant. In special circumstances, hardened steel plate of a thickness sufficient to prevent penetration of the projectile may be used for the range floor if the designer provides design criteria, supporting data, and supporting calculations for approval. No protrusions from the floor that could be struck by bullets are permissible. Fully contained range floors should be cleaned using approved methods, such as HEPA-filtered vacuuming or damp mopping. Water wash-down or dry sweeping is not permitted. Design the range floor as a pavement to support anticipated vehicular loads (training or service vehicles). Design and locate floor slab joints to minimize the potential for unpredictable ricochets. Sawed control joints no more than 6 millimeters (0.25 inch) wide are permitted. Locate longitudinal floor joints between firing lanes. Traditional chamfered construction joints are not permitted.

7.2.6. Wall Surfaces. Construct wall surfaces for fully contained ranges of reinforced concrete, fully grouted reinforced masonry, or hardened steel plate of a thickness sufficient to prevent penetration by any projectiles fired on the range. If hardened steel plate walls are used, submit data and supporting calculations to the MAJCOM for approval. Steel plate wall designs must address noise abatement and must not have exposed bolts or anchors. If concrete or masonry walls are used, they must remain unpainted to preserve their inherent sound-absorbing properties. Walls should have a continuous smooth surface, with no projections above the wall surface from bolt or rivet heads or the leading edge of deflector plates. Wall expansion/contraction joints should be designed with care to ensure a smooth wall surface is maintained. The typical 19-millimeter (0.75-inch) chamfered wall joint detail is not permitted unless baffle/deflector plates are incorporated in the joint design to span the chamfer. To eliminate erratic ricochets, install baffle/deflector plates to protect any range features attached to the wall. The deflector plates should be recessed into the wall surface to eliminate exposed edges.

7.2.7. Openings. If an existing building is converted for use as a range, all openings downrange of the firing line must be filled in with ballistic safety
structures. All heating, ventilation, and air conditioning (HVAC) equipment downrange of the firing line must be located behind baffles or the backstop. In new buildings, conceal pipes and conduits in the walls, above the ceiling baffles, or behind protective baffles. In converted buildings, relocate exposed pipes or provide protective construction. When doors are required downrange, they must be constructed of ballistic-resistant materials and equipped with hardware to allow opening only from the range side. Protect downrange doors with baffles and provide them with a visual and audible alarm.

7.2.8. Ventilation. The ventilation system must control exposure to lead in accordance with 29 CFR 1910.1025, Lead. The supply and exhaust air system is critical to the safe operation of fully contained ranges and for the health of range users.

7.2.8.1. Airflow. The ventilation system should provide laminar airflow across the range toward the bullet trap. At the firing line, the air velocity must be 23 meters per minute (mpm) (75 feet per minute [fpm]), ±4.6 mpm (15 fpm). Airflow should be evenly distributed across the firing line ±4.6 mpm (15 fpm). Noise from the ventilation system will not exceed 85 decibels (dBA) behind the firing line.

7.2.8.2. Air Distribution. To ensure contaminants are removed from the firing line, install a perforated air distribution plenum, radial plenum, or other distribution fixture along the rear wall to provide unidirectional airflow across the firing line and continuing downrange. The air-distribution fixture should be installed to ensure prescribed air velocities at every shooter location. The distance from the firing line to the perforated rear wall, radial plenum, or other distribution fixture will be a minimum of 5 meters (16.4 feet). The air distribution plenum openings must be sized to provide no more than 610 mpm (2000 fpm) velocity through the openings, with a recommended velocity between 122 mpm to 183 mpm (400 fpm to 600 fpm).

7.2.8.3. For a fully contained indoor range, the ventilation design must include a positive exhaust system for effectively capturing and removing airborne contaminants. Maintain slightly negative air pressure on the range, achieved by exhausting 3 to 7 percent more air than is supplied. Supply and exhaust fan systems must have control interlocks to ensure simultaneous operation. All doors into the negative-pressure area must have air locks. Re-circulation of range air is not permitted.

7.2.8.4. Exhaust Intakes. To ensure proper airflow, locate exhaust intakes at or behind the bullet trap.

7.2.8.5. Exhaust Air Discharge. Exhaust air discharged from the range and bullet traps must meet local, state, and federal requirements and be separated from the supply air intake to prevent cross-contamination of heavy-
metal-laden air. If the range is part of a larger building, do not discharge exhaust air at locations which could cause cross-contamination of overall building air.

7.2.8.6. Supply Air. Because re-circulated air within a range is prohibited, range supply air should not be heated or cooled. Therefore, the range shall be designed as an unconditioned environment. Fully contained ranges in colder climates may require radiant heat on the firing line.

7.2.8.7. Personnel should not be exposed to airborne contaminants above permissible limits at firing ranges. The Occupational Safety and Health Administration (OSHA) has established the permissible exposure limit (PEL) for airborne lead as 50 micrograms per cubic meter (8-hour time-weighted average). The PEL for other heavy metals can be found at 29 CFR 1910.1000, Air contaminants, Table Z-1, “Limits for Air Contaminants,” and Table Z-2, “Toxic and Hazardous Substances.” Fully contained ranges (indoor and outdoor) must have ventilation systems designed to control exposure to airborne contaminants. BE will evaluate potential exposure to airborne contaminants to determine if the ventilation system is adequately controlling the hazard. Lead-free ammunition (LFA) may be used to eliminate the lead contamination concern with older existing ventilation systems.

7.2.9. Noise Reduction. Engineering controls to reduce noise levels and dampen reverberation shall be implemented. Noise reduction in the range and noise transmission out of the range are different design considerations. Mass and limpness are two desirable attributes for sound absorption. Unpainted heavy masonry walls provide mass. Absorptive acoustical surfacing will reduce the noise level in the range but have little effect on transmission outside the range. Ambient noise levels at the firing line shall not exceed 85 dBA. Short-duration noise such as gunfire will exceed the 85 dBA level and may be as high as 160 dBA. Reflective surfaces in a range will reverberate noise during firing, extending the decay rate of the noise. Long decay rates (>1 second) will require the engineer to treat the noise not only as impulse (peak pressure considerations) but also as continuous noise. Therefore, sound-absorbing materials should be used to reduce the reverberation rate to below 1.5 seconds.

7.2.9.1. Use acoustical treatment on surfaces behind the firing line and on the wall and baffle surfaces of the up-range half of the range. Acoustical material shall be nonflammable and will not impede heavy metal dust removal using a vacuum process. Floor areas behind the firing line may be covered with acoustic material (rubber mats) if it will not impede heavy metal dust removal.

7.2.9.2. Do not paint downrange walls or acoustic tile, since paint significantly degrades the sound-absorbing qualities of the materials. Existing ranges may continue using painted surfaces. Special sound-absorbing concrete blocks are available that reduce noise in the range.
7.2.9.3. Acoustic panels no larger than 1200 millimeters (47 inches) wide may be installed on walls, ceilings, and baffles. Blown-on acoustic material and carpeting are not permitted due to the difficulty of cleaning accumulated heavy metal dust.

7.2.9.4. Operational controls. Appropriately identified and properly fitted hearing protection will help reduce noise exposure for personnel below 85 dBA. BE will evaluate noise exposures and make recommendations for proper hearing protection to reduce noise levels for shooters and range personnel.

7.2.10. Fire Protection. Burnt propellant, muzzle flash, freezing temperatures, and bullet damage all conflict with the operation of standard fire protection design. To resolve these conflicts, the Air Force only requires sprinklers when the range is constructed integral with range support facilities like training rooms and cleaning rooms. Sprinklers are required in the range support facilities and on the firing platform area, but are not needed in the downrange area or at the target area. Smoke and infrared detectors are also problematic and impractical in the downrange area or at the target area because of the amount of smoke and periodic muzzle flashes from the weapons. No detection is required in the downrange area and none in the range support facilities or firing platform area since these areas are protected by sprinklers. Assume metal bullet traps—rubber, foam, and other materials used for bullet traps may require dedicated additional fire protection features per the manufacturer’s recommendation. Egress paths shall not require travel downrange from the primary firing line. Downrange space shall not be included in calculating minimum egress capacity requirements. Egress marking, emergency lighting, and egress door hardware shall not be required downrange of the primary firing line.

7.2.11. Infrastructure.

7.2.11.1. Range Control Booth. The control booth is a control center from where the chief range officer can observe and control the entire range. All range types should have a control booth. The following criteria apply to the design and construction of control booths.

7.2.11.1.1. Locate the control booth behind the ready line. Place the booth to permit an unrestricted view of all firing positions. The booth location and design must not impede ventilation airflow.

7.2.11.1.2. The minimum size for the control booth platform is 1.5 meters by 3 meters (5 feet by 10 feet). Align the long side parallel to the firing line.

7.2.11.1.3. The booth must be high enough (0.6 meter [2 feet] minimum above the floor) to permit the range official an unrestricted view of the
entire firing line and the projectile impact area, including all range entry points. Also, windows and doors within the booth must not restrict or distort the range official’s view. Closed-circuit television monitors may be used to enhance, but will not replace, this requirement.

**7.2.11.1.4.** Provide a work table or counter at least 0.8 meter by 1.2 meters (2.5 feet by 4 feet) to accommodate reference materials, and provide at least one duplex electrical outlet in the worktable/counter area. Provide lighting for night/limited-visibility operations.

**7.2.11.1.5.** The range control booth should have positive pressure relative to the rest of the range or be sealed/isolated so that fumes and dust from firing do not enter and contaminate the booth.

**7.2.11.2.** Communication System. The range communication system must support communications between the control booth, the firing line, range control, range support buildings, and emergency response personnel. A permanent, hard-wired public address system is required. On a multiple-range complex, the system must also support communications between individual ranges. If it is not practical to install landlines, or if a break in landline service occurs, radio or cellular communications may be used. The control booth should be wired with connections to the base local area computer network.

**7.2.11.3.** Lighting. Design downrange lighting in accordance with the IESNA *Lighting Handbook* to provide for safety and housekeeping operations as well as general range illumination. Light intensity at the target face should be 914 to 1076 lux (85 to 100 foot-candles) measured 1200 millimeters (47 inches) above the range surface at the target face. Provide approximately 322 lux (30 foot-candles) for white light general range illumination. An optional 107 lux (10 foot-candles) for red general lighting may be installed if night training scenarios are required. Provide controls to vary lighting intensity throughout the range to accommodate subdued-light training requirements. Controls for all lighting will be operated from the control booth. Optional flashing red and blue lights may be installed at the firing line and downrange to simulate emergency situations.

**7.2.12.** Barriers, Fences, and Signs. Secure the range and SDZ areas to prevent unauthorized entry. Use barriers to block roads, walkways, or paths.

**7.2.12.1.** Fully contained ranges require barriers in the form of key-operated, locked doors or electrically locked doors to prevent entry while firing is in progress.

**7.2.12.2.** Non-contained (impact) ranges require a number of barriers and signs to make the range safe. The number of barriers required depends on
the number of roads, walkways, and paths that lead into the SDZ. Attach reflective warning signs to barriers.

7.2.12.3. Use fencing to prevent people, animals, and vehicles from entering range SDZs. A chain-link fence around the complete range complex, including the SDZ, is preferred. Use barriers or gates to block access paths. On existing partially contained baffled ranges with earth side berms and an earth/metal backstop, as a minimum, install a 1.82-meter (6-foot) chain-link fence along the sides of the SDZ and on the downrange side of the impact area, incorporating the berms. Install the fence no closer than 5 meters (16 feet) from the toe of the berms and backstop. For fully contained ranges with concrete containment walls and an earth/metal backstop, as a minimum, install the fence from one wall, around the backstop, to the opposite wall when range components are exposed. For example, if the back side of the bullet trap and spent round-retrieval system is exposed, erect a fence to restrict access by unauthorized personnel. Provide a locked access gate for maintenance equipment.

7.2.12.4. Typical range signs are shown in Figure 7. Warning signs, and flashing red warning lights for night operations, should be positioned on the approaches to the range and along the perimeter of the SDZ if access is not otherwise restricted. Place red flags and/or rotating/flashing red lights at appropriate locations to signal when the range is in use. Place signs along the normal boundaries of the range. Post the signs no more than 100 meters (328 feet) apart along the range perimeter, parallel to roads or paths. Based on local topography, place signs close enough to give reasonable warning along other areas of the SDZ. Refer to Table 2 for proper location of warning signs. Signs must be bilingual where English is not the national language or multilingual where needed. Post bilingual signs on continental United States (CONUS) ranges located near foreign borders. Consult the installation legal office for local policy on bilingual signs. Construct warning signs in compliance with UFC 3-120-01, Air Force Sign Standard. The warning signs should have standard red letters on a white background.
Figure 7. Typical Range Signs

DANGER
FIRING RANGE
DO NOT ENTER

DANGER
WEAPONS FIRING IN PROGRESS
KEEP OUT

DANGER
FIRING IN PROGRESS
WHEN RED FLAG IS FLYING

NOISE HAZARD
DOUBLE HEARING PROTECTION REQUIRED
Table 2. Locations of Warning Signs

<table>
<thead>
<tr>
<th>Warning Sign</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger</td>
<td></td>
</tr>
<tr>
<td>Firing in Progress</td>
<td>Approach roads</td>
</tr>
<tr>
<td>When Red Flag is Flying</td>
<td></td>
</tr>
<tr>
<td>Danger</td>
<td></td>
</tr>
<tr>
<td>Firing Range</td>
<td>Fencing and barriers every 100m (328 ft)</td>
</tr>
<tr>
<td>Do Not Enter</td>
<td></td>
</tr>
<tr>
<td>Danger</td>
<td></td>
</tr>
<tr>
<td>Weapons Firing in Progress</td>
<td>Entry road</td>
</tr>
<tr>
<td>Keep Out</td>
<td></td>
</tr>
<tr>
<td>Noise Hazard</td>
<td></td>
</tr>
<tr>
<td>Double Hearing Protection Required</td>
<td>Firing line</td>
</tr>
</tbody>
</table>

7.2.13. Utilities. Install utilities to prevent damage from normal firing range operations. Do not place any aboveground utilities in the impact zone or the ricochet zone. When utilities are directly behind backstops or berms, provide access for a maintenance vehicle. Underground utilities with proper cover may be placed anywhere on the range complex if maintenance and repair easements are provided.

7.2.13.1. Water and Sanitation. Water must be available for drinking, sanitation, hand-washing stations, and safety equipment. Drinking water and a latrine may be provided by adjacent range support facilities. The required latrine size will be determined using conventional planning criteria and based on the number of people (instructors and trainees) supported.

7.2.13.2. Electrical Power. Provide electrical power for lighting, maintenance equipment, public address systems, ventilation, bullet trap dust collection system, and target-turning mechanisms.

7.2.14. Roads and Parking. Design roads and parking for access by passenger vehicles and light or medium trucks. Provide surfaced all-weather roads for connector roads from public roads to the range complex. Parking and roadway standoff must comply with UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*. 
7.2.14.1. Range access roads must approach the range complex from behind the firing line and outside the SDZ footprint.

7.2.14.2. Locate parking areas to the rear of the firing platform. On fully contained ranges, the parking area may be beside the range-side containment walls. Typically, one parking space per firing position, plus an allowance for range personnel, is sufficient. Ranges with heavy training loads occasionally require two spaces per firing position. When feasible, surface parking lots for all-weather operation.

7.2.15. Storm Water Runoff and Drainage. Design storm water control structures to prevent storm water erosion of impact berms. Divert surface water runoff within the range (including the SDZ) using best management practices (BMP) for heavy metal management that may include filtration, vegetated detention or retention basin, or other engineered structure to prevent direct discharge to a surface water body. Discharge of effluent to water bodies must meet all requirements of federal, state, and local laws.

7.2.16. Environmental Contaminant Monitoring. An environmental contaminant monitoring program may provide early indications of contaminant movement within and/or between environmental matrices, e.g., soil, groundwater. A comprehensive monitoring program includes sampling soil, surface water, and groundwater. The frequency of sampling is dependent on many factors including, but not limited to, how often the range is used and unique site conditions. Consult with the installation CE and BE personnel to determine if a contaminant-monitoring program is required.

7.3. Additional Criteria for Non-contained Ranges.

7.3.1. Siting Considerations. Take advantage of natural geologic formations for use as backstops. Trees are allowed downrange of the impact berm, but not between the firing line and the target line. Take advantage of natural drainage. Where terrain permits, slope the range floor toward the backstop. Flowing watercourses (streams, ditches) in the impact area or near a berm should be avoided. Avoid establishing range impact areas in wetlands or in locations subject to frequent flooding. The non-contained range line of fire should not be in the direction of residential areas or upwind of residential areas.

7.3.2. Provide maintenance vehicle access to all range areas, including the backstop, side earth berm areas, and impact areas.

7.3.3. Soils. Do not use pea gravel to surface or edge the impact area of the range or the area between the firing line and the target line. Naturally occurring soils that are not excessively rocky may be used between the firing line and the target line. Typically these will be clays, clayey sands, sands, silts, and silty
sands that are mostly free of rocks and debris, with no more than 15 percent of the material gradation retained on a 24-millimeter (1-inch) sieve.

7.3.3.1. Soil Amendments. BCE environmental management must test soils within the impact areas for pH levels every two years. The desired pH ranges from 7 to 8. Test soil additives to ensure that they will not cause cementing or hardening of the soil surface. Do not use lime as an additive or soil conditioner when the natural soil gradation includes more than 30 percent passing the #200 sieve, ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates, and/or the natural soil Plasticity Index is higher than 12.

7.3.3.2. Vegetation. Maintain vegetation on berms and drainage-ways when possible. Plant grass on impact areas. Turf grasses do an especially good job of retaining water and sediment onsite. Choose a grass variety that is native to the area and will require minimal water and fertilizer.

7.3.3.3. Reclamation and Recycling. Remove lead from the impact face of earth berm backstops when there is evidence of lead mass buildup. This will typically require that soil be excavated to a depth of 0.6 to 0.9 meter (2 to 3 feet) and screened using a 4-millimeter (#5) wire screen. Personnel certified in lead reclamation and wearing proper personal protection may sift the lead from the soil by screening onsite after consulting with BE personnel and satisfying all environmental requirements. Reclaimed lead must be disposed of or recycled in accordance with federal, state, and local laws and regulations. Consult CE environmental management, BE, and the Defense Reutilization Management Office (DRMO) about reclaiming, recycling, or disposing of lead. Lead removed from bullet traps and earth berms is not considered a hazardous waste if recycled for metal recovery.

7.4. Additional Criteria for Fully Contained Ranges. Construct fully contained ranges to preclude any bullets from leaving the containment limits. This requires additional attention to detail so no gaps, openings, or other paths for bullet escape are present. Use ballistic safety structures to provide the containment. For fully contained ranges, construct overhead baffles with a minimum of 150 millimeters (6 inches) of horizontal overlap between the trailing edge of any baffle and the leading edge of the next baffle downrange. Figure 8 shows a baffle arrangement for full containment.
NOTES

1. This profile is based on a level range and a fixed firing line.
2. The target distance is established by CA to satisfy the intended training or courses of fire.
3. A tactical, fully contained range will allow shooters to move laterally along the firing line and downrange.
4. Overhead baffles must be angled from 12° to 32° from the horizontal.
5. Fully contained ranges require a 150-mm (6-in.) minimum baffle overlap.
6. For existing partially contained ranges, baffles are spaced as required to bring the bullet into the baffle at a point not less than 300 mm (12 in.) below the top of the following baffle as measured along its slope.
7. The bullet impact point on the bullet trap is not less than 300 mm (12 in.) below the top edge of the trap as measured along the slope.
8. If vehicle access is not required, locate the bottom of the baffles at least 2.45 m (8 ft) above the firing platform.
9. If vehicle access (without machine gun pedestal) is required, locate the bottom of the baffles at least 3.68 m (12 ft) above the platform.
10. The canopy baffle may be sloped up to 30 degrees from the horizontal. If sloped, the high point of the canopy is closest to the target line.

Figure 8. Typical Overhead Baffle Configuration

7.5.1. Canopy Baffles. A canopy baffle is an angled or horizontal baffle attached to and directly above the firing platform, extending downrange from the firing line. It prevents direct-fired rounds from escaping the range between the firing line and the first overhead baffle. The bottom of the canopy baffle must be at least 2.45 meters (8 feet) above the level of the firing platform if vehicle access is not required. The canopy will begin at least 1 meter (3.2 feet) behind the firing line and extend at least 4 meters (14 feet) forward of the firing line toward the target line. A canopy baffle may be used to provide a covered firing line position on a non-contained range without either overhead baffles or side containment. Face the portion of the canopy baffle directly over the firing positions with plywood, lumber or other approved material (par. 8.2) of sufficient thickness to capture the ricochet from a round fired directly over the shooters.

7.5.2. Overhead Baffles. An overhead baffle is an angled baffle (vertical baffles are not authorized for new range projects) installed downrange to deflect and contain direct-fired rounds. Install overhead baffles downrange between the overhead canopy and the backstop. A shallow angle deflects bullets more easily and there is less metal fatigue and denting in the surface of the plate. A fully contained range requires a 150-millimeter (6-inch) minimum overlap of baffles. The overlapping baffles will allow shooter movement throughout the range and will prevent projectiles from leaving the range even if the weapon is accidentally fired straight up. Line-of-sight analysis shall consider rounds fired from any angle and any training position forward of the firing line. Angled overhead baffles redirect projectiles downrange. Install angled overhead baffles with the bottom edge further downrange than the top edge. Install overhead baffles parallel to the firing line. Refer to Figure 8 for a typical configuration. Install angled overhead baffles for new ranges and baffle replacement projects.

7.5.3. Additional Criteria for Vehicle Access. New training scenarios will use vehicles for practicing vehicle dismount, cover, and engaging targets from the vehicle. The design vehicle for range design purposes is a HMMWV (“Humvee”) without a pedestal-mounted weapon. Vehicle access requires consideration of higher clearance from range floor to baffles and vehicle paths into the range. See Figure 8, note 9.

7.5.4. Ground Baffles. Ground baffles are not permitted on Air Force ranges.

7.5.5. Baffle Construction.

7.5.5.1. Construct ballistic safety structures for fully contained ranges with attention to the quality of the fabricated parts. Baffle plates with butt joints must fit together closely to prevent any gaps more than 1.6 millimeters (0.0625 inch) wide. Modern plate-cutting techniques can provide precise dimensions, but particular care must be taken in erecting the baffles to ensure
a precision fit of parts. The development of construction/erection details that use overlapping joints and joint-closure plates may provide a better, more economical solution than precise fabrication and also may simplify the erection procedures.

7.5.5.2. As a minimum, use materials specified in Table 3. These materials may also be used for protective construction. For angled-steel plate baffles, install plywood facing to prevent “splash-back” ricochets on baffles located within 5 meters (16.4 feet) of the expected position of the shooter. If shooters move downrange and fire, splash-back protection will be required for baffles at the downrange locations as well. Plywood shall be fire resistant treated (FRT) plywood in accordance with International Building Code (IBC) section 803 class A flames spread 0-25 and smoke development 0-450. Note: The Brinnell Hardness Number (BHN) measures steel hardness. The higher the BHN, the harder the steel.

Table 3. Construction Materials for Canopy and Overhead Baffles

<table>
<thead>
<tr>
<th>Weapons, Ammunition</th>
<th>Construction*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handguns, .22 LR, .38 cal., .45 cal., .357 cal., 9mm, .44 cal.</td>
<td>6 mm (0.25 in) steel plate with a nominal 440 BHN or higher, covered with one sheet of 19 mm (0.75 in) and one sheet of 11 mm (0.4375 in) plywood</td>
</tr>
<tr>
<td>Rifle, carbine, machine gun, 5.56mm, 7.62mm, .30 cal.</td>
<td>10 mm (0.375 in) steel plate with a nominal 500 BHN, covered with one sheet of 19 mm (0.75 in) and one sheet of 11 mm (0.4375 in) plywood</td>
</tr>
</tbody>
</table>

*Notes:

1. On steel plate baffles, install FRT plywood facing on overhead baffles located within 5 meters (16.4 feet) of the shooter to mitigate the risk of “splash-back” ricochets. Attach the 19-millimeter (0.75-inch) sheathing to the steel using flathead countersunk screws. Attach the 11-millimeter (0.4375-inch) FRT plywood to the 19-millimeter (0.75-inch) sheathing using #8 flathead screws at 300-millimeter (11.8-inch) spacing.

2. Nominal AR500 ballistic plate manufactured to BHN 500 may have BHN values ranging from 480 to 530.

7.5.6. Side Containment or Sidewalls. Sidewalls are required to prevent direct fire from exiting the range. Finished elevation of a sidewall must be above the top edge of the highest overhead baffles. Each sidewall must be at least 1.52 meters (5 feet) from the outside edge of the firing position limits of fire and extend at least 1 meter (3.2 feet) to the rear of the firing line. Sidewalls may be made of earth, fully grouted reinforced masonry block (CMU), reinforced concrete, or hardened steel.
7.5.6.1. Continuous Walls. Vertical smooth-faced walls constructed of reinforced concrete, CMU with fully filled cores, or hardened steel may be used for sidewalls. Table 4 lists minimum wall thicknesses. Design these walls for all dead and live loads, including lateral forces. See paragraph 7.2.9 for noise-reduction requirements. Walls will extend 1 meter (3.2 feet) behind the firing line to prevent a bullet fired parallel to the firing line from leaving the range.

Table 4. Sidewall Minimum Thickness

<table>
<thead>
<tr>
<th>Material</th>
<th>Caliber</th>
<th>.45/9mm</th>
<th>5.56mm</th>
<th>7.62mm</th>
<th>.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>3500 psi concrete</td>
<td>.45/9mm</td>
<td>150 mm (6 in.)</td>
<td>150 mm (6 in.)</td>
<td>200 mm (8 in.)</td>
<td>300 mm (12 in.)</td>
</tr>
<tr>
<td>Grout-filled CMU</td>
<td>5.56mm</td>
<td>150 mm (6 in.)</td>
<td>150 mm (6 in.)</td>
<td>200 mm (8 in.)</td>
<td>300 mm (12 in.)</td>
</tr>
<tr>
<td></td>
<td>7.62mm</td>
<td>150 mm (6 in.)</td>
<td>150 mm (6 in.)</td>
<td>200 mm (8 in.)</td>
<td>300 mm (12 in.)</td>
</tr>
<tr>
<td></td>
<td>.50</td>
<td>150 mm (6 in.)</td>
<td>150 mm (6 in.)</td>
<td>200 mm (8 in.)</td>
<td>300 mm (12 in.)</td>
</tr>
</tbody>
</table>

7.5.6.2. Discontinuous Sidewall Baffles. Side baffles are similar to overhead baffles, except they provide discontinuous protection to each side of the range outside the entire length of the line of fire. They are set between 15 and 45 degrees relative to the line of fire and provide an advantage over continuous walls whenever cross-range ventilation is needed.

7.5.6.3. Earth Berms. The slope of earth berms must not exceed a 2:3 vertical-to-horizontal ratio unless materials are stabilized. If native soil characteristics will not produce a stable slope at this angle, use fabric reinforcement in the fill. The soil may require conditioning to achieve satisfactory soil pH levels to prevent lead decomposition. Typical angles of repose for natural soils in loose or least-dense state are shown in Table 5. Use Table 5 only as a guide, since mechanical stabilization may increase the angle of repose. The width of the top of the berm must be at least 3 meters (9.8 feet). Construct the outer layer (2 meters [6.5 feet] thick) of the impact face with sands, silty sands, or clayey sands, free of rocks, and with 100 percent passing the #4 sieve, ASTM C136. Soil with more than 40 percent clay-size particles passing the #200 sieve is not acceptable for the outer 2-meter (6.5-foot) layer of the impact face. Clay may be used for the core. For erosion control, plant a vegetative cover on the faces and tops of berms. Irrigation devices may be used on the faces and tops of berms not subject to direct fire. Ensure access for maintenance vehicles.
Table 5. Natural Angles of Repose (Internal Friction) for Naturally Occurring Soils

<table>
<thead>
<tr>
<th>Soil Types</th>
<th>Angle of Repose/ (Internal Friction)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silty sand/fine sand/clayey sand</td>
<td>30</td>
</tr>
<tr>
<td>Coarse sand</td>
<td>35</td>
</tr>
<tr>
<td>Silts</td>
<td>25</td>
</tr>
<tr>
<td>Gravel/sandy gravel/gravelly sand</td>
<td>34</td>
</tr>
</tbody>
</table>

7.5.7. Backstops. A backstop is used behind the target line. It must stop a direct-fire bullet by media capture or deflect the bullet into a trap.

7.5.7.1. Earth Backstops. Earth backstops are the most common backstop for non-contained ranges. As an example, for a 25-meter (82-foot) non-contained range, locate the backstop so the longitudinal centerline of the berm (backstop) is at least 50 meters (164 feet) from the firing line. The toe of the slope must be located at least 9 meters (29.5 feet) from the target line nearest the backstop. The top of the backstop must be high enough so that a line drawn from the firing line and under the last overhead baffle will intersect the backstop at least 2 meters (6.5 feet) below its top. The impact face of the earth backstop must be soil with 100 percent passing the #4 sieve, ASTM C136, for a depth of 2 meters (6.5 feet). The slopes should be stabilized with grass vegetation and access provided for maintenance and repair equipment. Incorporate a steel deflector plate (eyebrow) into the backstop if a higher degree of confidence is required to prevent direct-fired rounds from leaving the impact area of the backstop. Soil with more than 40 percent clay-size particles passing the #200 sieve is not acceptable for use in the impact area face of the backstop. If required, soil should be conditioned to achieve suitable pH levels as indicated in paragraph 7.3.3.1.

7.5.7.2. Metal Backstops. Metal backstops are large plates installed behind the target line to stop direct fire and ricochets. Metal backstops are not approved for new construction. They are typically found on older existing partially contained or fully contained ranges but may be found on non-contained ranges. A metal backstop is not a bullet trap. See paragraph 7.5.7.4 for bullet trap requirements. The metal backstop should be located a minimum of 15 meters (49 feet) beyond the target line to allow target and backstop maintenance and to minimize the possibility of splashback ricochets or lead exposure to the shooters executing a downrange course of fire. Additionally, provide sufficient vehicle access to maintain the backstop. The required direct fire and ricochet containment must not be compromised when providing vehicle access. On outdoor ranges, provide corrosion protection for
a metal backstop. Painting does not provide adequate protection. Consider adding an overhead cover to provide protection.

**CAUTION**

Do not use armor-piercing or incendiary rounds with metal backstops or bullet traps unless the backstops or traps have been designed to accommodate these rounds. If commercially designed range components are used, ensure that the products satisfy the design requirements for the ammunition used on the range.

7.5.7.3. Backstop Deflector Plates (Eyebrows). A deflector plate is not a bullet trap. See paragraph 7.5.7.4 for bullet trap requirements. A backstop deflector is typically installed on top of an earth backstop to provide added containment safety. Install the backstop deflector plate at an angle between 30 and 42 degrees from horizontal (see Figure 11). Angles other than these are permissible if test data and calculations support the design. Set the highest edge of the deflector plate nearest the firing line. The shallow angle deflects bullets more easily and there is less metal fatigue and denting in the surface of the plate. Anchor steel plates supported by concrete or masonry with flush countersunk heads. Eliminate exposed edges which may produce erratic ricochets. Ensure edges of steel plates are milled at all joints and joints are butted flush and smooth. Plates must be free from buckle or wave. Exposed edges must be chamfered to a 45-degree angle to a fillet approximately 4 millimeters (0.16 inch) wide. Exposed structural members supporting deflector plates are not permitted. Welding must conform to AWS D1.1, *Structural Welding Code – Steel*, latest edition. Position steel plates so welds are no closer than 450 millimeters (17.7 inches) from the center of a target position. Steel plate jointed at and supported on structural steel supports must be spot-welded.

7.5.7.4. Bullet Traps. Only commercially designed and constructed bullet traps are permitted. Sand, media, or water traps (recycled lubricating water excepted) are not permitted in new construction. Bullet traps are typically used on contained ranges and placed in front of the backstop or rear wall of the range. They are total systems that deflect, stop, trap, and contain directed-fired rounds, and may incorporate vacuum or other dust-management systems to capture projectile particles. Bullet traps installed at indoor ranges must have a dust-management system installed to provide heavy metal particle removal from the range environment. The bullet trap must be designed to accommodate the ammunition/weapon to be fired as well as the expected quantity of ammunition fired (annual rate of fire). The bullet trap should extend the entire width of the firing line. The trap shall not present any blunt surface exposure that would create a ricochet hazard internal to the equipment or at the connection to the sidewalls and floor. All future purchases
of bullet traps must incorporate trap designs with a continuous, non-partitioned, and unbroken slot or bullet path into the deceleration chamber. In the past, typical design fabrication details have had vertical bulkhead plates in the deceleration chambers. These plates create vertical blunt edges that cause back-splash-type ricochets of the steel penetrator tips of the M855 5.56mm round. There have been documented cases of the steel penetrator tips ricocheting back to the firing line and endangering the shooters. The trap must have the capability to be cleaned of accumulated deposits of bullets and fragments while minimizing lead exposure to the maintainer.

**Note:** Only trained personnel wearing proper personal protection will remove lead, and only after consulting with BE personnel and following the trap manufacturer’s recommended procedures.

The space directly behind the bullet trap must be easily accessible for maintenance and repair of the bullet trap and backstop. The bullet trap's metal thickness and hardness must meet the minimums listed in Table 6 for each type of ammunition to be fired on the range. If lesser thicknesses are proposed, the range component designer must provide test data and calculations supporting a lesser thickness. Angles of the metal plates must conform to those directed by the manufacturer to handle the munitions fired from varying shooter positions, target distances, and target positions. Design all traps for tracer rounds if a tracer round can be used in the weapon operated on the range.

**7.5.7.4.1. Qualifications for Commercial Trap Manufacturers.** Commercial bullet trap and range component manufacturers must demonstrate at least five years of continuous component manufacturing and submit a minimum of five examples, with customer references, of similar range components installed by the manufacturer.
### Table 6. Minimum Steel Plate Thickness for Metal Backstops, Deflector Plates, and Bullet Traps

<table>
<thead>
<tr>
<th>Max Angle</th>
<th>Ammunition</th>
<th>Armor Plate/300 BHN</th>
<th>440 BHN</th>
<th>500 BHN</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>.22 LR rim fire</td>
<td>6 mm</td>
<td>6 mm</td>
<td>6 mm</td>
</tr>
<tr>
<td>42</td>
<td>.38 cal. ball</td>
<td>10 mm</td>
<td>6 mm</td>
<td>6 mm</td>
</tr>
<tr>
<td>42</td>
<td>.45 cal./.357 cal.</td>
<td>10 mm</td>
<td>6 mm</td>
<td>6 mm</td>
</tr>
<tr>
<td>42</td>
<td>9mm pistol</td>
<td>10 mm</td>
<td>6 mm</td>
<td>6 mm</td>
</tr>
<tr>
<td>42</td>
<td>.44 cal. magnum</td>
<td>12 mm</td>
<td>10 mm</td>
<td>10 mm</td>
</tr>
<tr>
<td>30</td>
<td>5.56mm, 7.62mm</td>
<td>12 mm</td>
<td>Not recommended</td>
<td>10 mm</td>
</tr>
<tr>
<td>30</td>
<td>.30 cal. carbine</td>
<td>12 mm</td>
<td>Not recommended</td>
<td>10 mm</td>
</tr>
</tbody>
</table>

**Note:** 0.25-inch and 0.375-inch plate may be substituted for 6-mm and 10-mm plate, respectively.

7.5.8. Metal Backstop, Deflector Plates, and Bullet Trap Material.

#### 7.5.8.1. Construct metal backstops, deflector plates, and bullet traps with the minimum metal thickness and hardness listed in Table 6. Small variations of BHN (less than 5 percent lower than the nominal number) are acceptable.

The design/specification must reference the applicable ASTM standard (ASTM A514/A514M) or military specification, the grade of steel required, and the hardness. To ensure that the correct grade of steel is installed (all steel plate looks the same), require a certificate of compliance. Plate thickness tests were conducted for the plate angles listed; however, a flatter plate angle is desired (the flatter the angle of the plate, the better). A shallow angle deflects bullets more easily, and there is less metal fatigue and denting on the surface of the plate.


7.6. Range Support Facilities. Range support facilities include the CA building and munitions storage room/building (Category Code 171-476), a building for storing range supplies and equipment (Category Code 171-472), and a building for target storage and repair (Category Code 171-473).

#### 7.6.1. CA Building. The CA building provides a temperature-controlled environment for the CA section. The building houses classrooms, administrative
offices, weapons maintenance areas, space for cleaning and degreasing weapons, an alarmed weapons and munitions storage room, sanitary facilities, a student weapons cleaning room, and miscellaneous storage. Figure 9 presents an example of a typical floor plan. A small arms range with more than 21 firing points or an installation with more than one range or type of range requires proportionately larger facilities. Give consideration for space to accommodate weapons simulator training as mission needs dictate.

Figure 9. A Typical CA Building Configuration

7.6.1.1. Classrooms. Classrooms must be large enough to provide each student receiving handgun, rifle, shotgun, or submachine gun training a chair and a table work surface of at least 610 by 915 millimeters (24 by 36 inches). Provide space for each student receiving machine gun or LAW training to accommodate a work surface of at least 865 by 1145 millimeters (34 by 45 inches). The classroom will include a raised instructor’s platform, aisle space for instructor access to individual tables, and sufficient space and connections for audio-visual equipment and computers.

7.6.1.2. Administrative Space. This area (typically about 13 square meters [140 square feet]) contains offices for program administrators and CA personnel such as the NCOIC and several instructors.
7.6.1.3. Weapons Simulator Room. This room is specifically designed for commercially purchased projection-based weapons simulators. A five-lane system requires a room approximately 10.7 meters by 5.3 meters (35 feet by 17.5 feet). A ten-lane system requires approximately 10.7 meters by 10.7 meters (35 feet by 35 feet). The room should have at least a 2.7-meter (9-foot) ceiling height and no windows. The room must have dimmable lighting, HVAC, and a minimum of four 110-volt and/or 220-volt dedicated power outlets to operate air compressors, projectors, and computers. Two dedicated telephone lines are required for operating the system and for remote diagnostic support.

7.6.1.4. Weapons Maintenance Shop. The weapons maintenance shop must have space for workbenches, hand tools, power tools, equipment, and spare parts storage. A range that supports less than 5,000 weapons requires a 28-square-meter (300-square-foot) shop. An installation that supports over 5,000 weapons will require 37 square meters (400 square feet). Provide a lavatory with potable water in the immediate area. An emergency eyewash station is also required. Provide additional ventilation as required. Maintain relative humidity (RH) below 65 percent.

7.6.1.5. Weapons Cleaning/Degreasing Room. This room accommodates workbenches, degreasing tanks, and spray hoods. Special design requirements include exhaust ventilation, vapor-proof electrical fixtures, compressed air service, and solvent-resistant wall and ceiling finishes. The minimum space requirement is typically about 12 square meters (130 square feet). A lavatory with potable water should be in the immediate area. An emergency eyewash station is also required. The installation SE office and BE may have additional design requirements. Exhaust make-up air can be transferred from the administrative and classroom areas as long as sufficient ventilation air is provided in those areas to prevent negative air pressure in relation to the outside.

7.6.1.6. Weapons and Ammunition Storage. The arms vault provides secure storage for all weapons for which the CA section is responsible, and a less-than-30-day supply of each type of ammunition used on the range. A gross floor area of 14 square meters (151 square feet) is usually adequate. Room construction must satisfy the requirements of AFI 31-101, Integrated Defense, and UFC 4-020-01, DoD Security Engineering Facilities Planning Manual, for construction materials and specifications. Additionally, requirements of DOD 5100.76-M, Physical Security of Sensitive Conventional Arms, Ammunition, and Explosives, must be satisfied. In general, vault construction must provide a minimum ten minutes of forced entry delay. Typical vault construction features walls, floors, and roof of 200-millimeter (7.9-inch) concrete reinforced with two layers of number 4 rebar on 225-millimeter (9-inch) centers, fitted with a class V door. Maintain RH below 65 percent.
7.6.1.7. Latrines (Sanitary Facilities). Provide facilities for both men and women. Provide additional cold-water hand-washing stations at the entrance to the CA building and at the firing range. The size of sanitary facilities depends upon the class size at that particular installation. Typically, the women's latrine need only accommodate about one-fourth the number of people as the men's latrine. Because instructors have daily contact with lead/heavy metals and may transfer these contaminants by casual contact, hand-washing stations, warm-water showers, changing areas, laundry facilities, and lockers should be provided for instructors to remove lead contamination. Use of these facilities at the end of each shift will prevent recurring casual contamination and potential health concerns, and prevent accidental inhalation or ingestion from residual lead.

7.6.1.8. Student Weapons-Cleaning Area/Room. Students must clean their weapons after completing firing. The cleaning area may be outside as long as it is covered; in cold climates, provide a room large enough to accommodate cleaning tables/benches and cleaning materials. Ensure the room is well ventilated and contains an emergency eye wash station.

7.6.1.9. Miscellaneous Storage. A storage area is required for administrative supplies, training aids, tools, and miscellaneous items. The size of this area is directly related to the type and quantity of training provided by the CA section.

7.6.2. Range Supplies and Equipment Storage. This building provides secure storage for miscellaneous range supplies, tools, and equipment. Use prefabricated metal, reinforced concrete, reinforced masonry, or wooden construction. Depending on location, type, and value of items stored, this facility may be combined with the target storage and repair building.

7.6.3. Range Target Storage and Repair Building. This facility provides space for repairing and storing targets and related equipment items, including target mechanisms and construction and repair material. Use prefabricated metal, reinforced concrete, masonry, or wooden construction. The repair space contains tables and workbenches. An electrical power source for operating power tools is required.

7.7. Specialty Weapons Ranges.

7.7.1. 40mm Grenade Launcher Range (Figure 3). The range supports firing of 40mm low-velocity grenades from M79 and M203 grenade launchers. The entire surface of the impact area must be cleared of vegetation or clipped extremely close during mowing so grenades will readily detonate on impact and EOD personnel can easily locate dud high-explosive rounds for disposal. Construct targets using lumber, steel, or concrete. Terrain features, course of fire, and weather conditions determine if a spotting tower may be needed for observing the impact area (to note point of impact for adjustment of fire and for safety).
Range personnel must be able to spot and mark dud rounds as they occur. A central tower high enough to permit observation of the entire range may be required. The range must have electrical power and lighting for the night-fire course.

7.7.2. LAW Range (Figure 4). The LAW range is set up for firing the M72 66mm rocket, the M73 35mm sub-caliber training device, and the 84mm AT-4. The danger zone to the rear of the launcher (Area F) must be clear of personnel, material, and vegetation. Arrange firing points so individual back-blast areas do not overlap.

7.7.3. Ten-Meter Machine Gun Range. If a non-contained machine gun range is not available, the machine gun must be fired on either a 10-meter tube range or on a fully contained range designed to accommodate the firing of the automatic weapon. Ten-meter tube machine gun ranges must incorporate range tubes as described in paragraphs 7.7.3.1 through 7.7.3.3. Range tubes function as baffles, thereby reducing the SDZ requirements. When the machine gun tube range is constructed in accordance with Figures 10 and 11, the SDZ length requirement is 700 meters measured downrange from the firing line. Range tubes are not required on a fully contained range designed for firing automatic weapons which has ballistic safety structures (baffles, traps, berms) designed to prevent penetration of the containment based on the ammunition being fired. Range tubes are also not required for a non-contained range with sufficient real estate to accommodate the full SDZ. The machine gun tube range is acceptable for M60/M240B/M249 machine guns.

7.7.3.1. Machine Gun Tubes.

7.7.3.1.1. If a non-contained machine gun range is not available, the 10-meter machine gun range tubes must measure at least 1.52 meters (5 feet) inside diameter by 7.3 meters (24 feet) in length. The tubes may be constructed of sectional pieces if the spigot end of the bell-spigot joint is pointed downrange. Tubes may be made of reinforced concrete pipe and must meet ASTM C76, Standard Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe, Class V reinforced concrete pipe (RCP) requirements, or may be steel pipe of suitable thickness fabricated from rolled plates. The interior of the tubes must have a smooth continuous surface. Repair any lifting lugs or holes so the tube interior is smooth and does not produce erratic ricochets.

7.7.3.1.2. For drainage, slope the tubes approximately 150 millimeters (6 inches) toward the target line. Firing positions must be at least 3.7 meters (12 feet) apart, measured center-to-center. The end of the tube toward the shooter should touch the firing line. When firing, the muzzle of the machine gun will be at least 150 millimeters (6 inches) inside the tube (see Figures 10 and 11).
Figure 10. Machine Gun, 10-Meter Tube Range Typical Range Configuration
7.7.3.2. Firing Platform. Ensure that the firing tube placement and the firing platform height will place the muzzle of the machine gun at the approximate center of the tube diameter and at least 150 millimeters (6 inches) inside the tube. A recess in the platform may be needed, about 76 millimeters (3 inches) deep and large enough to accept a tripod.

7.7.3.3. Backstop/Deflector Plate/Bullet Trap. For berm backstops, locate the berm no more than 45.7 meters (150 feet) from the firing line to the centerline of the berm. The minimum height of the backstop is established by determining where a line drawn from the firing line to the backstop, and intersecting the highest point that a bullet could exit the target end of the tube, intersects the berm. This line must intersect the berm not less than 2 meters (6.5 feet) from the top. When a deflector plate is used, locate the deflector plate at least 0.6 meter (2 feet) above the bullet impact point on the berm. For metal trap backstops, locate the trap at least 25 meters (82 feet) away from the firing point. The line drawn from the firing point to trap shall intersect the top plate of the trap not less than 300 millimeters (12 inches) from the top, measured along the slope of the trap.

7.7.3.4. Engineering solutions to reduce noise levels from tube ranges are limited and may consist only of sand bags along the bottom of the tube.
Appropriately operational mitigation must be established to reduce noise exposure in accordance with paragraph 7.2.9. The impact of hazardous noise levels for tube ranges must be evaluated by local SE and BE. BE will evaluate noise exposures and make recommendations for proper hearing protection to reduce noise levels for shooters and range personnel.


8.1. Design Approval.

8.1.1. The design agent will submit a set of prefinal drawings and project specifications to the respective MAJCOM representatives of CA, CE, SE, and BE for review to ensure compliance with this ETL.

8.1.2. After MAJCOM approval is complete, HQ AFSFC/SFXW must approve all new range designs, major renovations, and changes to the type or function of the range. This approval also applies to portable or trailer type ranges. HQ AFSFC/SFXW is the approval authority for deviations or waivers from design criteria and will coordinate requests with HQ AFCESA/CEO and AFMSA/SG3PB.

8.2. Baffle Test Before Construction. For baffles which differ from the weapons and construction mandated in Table 3, construct baffle test blocks/cells using the baffle materials and construction details specified in the design documents. Completion of this test is required before construction and installation of the overhead baffles. From a protected position, a shooter will engage the test block/cell with direct fire from the most powerful round authorized for the range. The baffle test should have secondary containment to stop the round if it penetrates the test baffle. Do not test the baffle blocks/cells using tracers. Do not test baffles after they are installed in their overhead position. Conducting direct-fire tests following construction could be very unsafe and costly if the baffles fail to stop the round. Machine gun range tubes do not have to be tested if they meet the material requirements listed in paragraph 7.7.3.1.1.

8.3. Construction Inspection. The BCE will validate that the proper materials have been used and construction complies with the specifications and drawings. The range and its support facilities, when completed, must satisfy or exceed the requirements of this ETL. The materials, distances, and angles are critical to safety. Distances from the firing lines to target lines are critical and must be measured during construction and on completion of the range. On fully contained ranges, visually check baffles to make sure they overlap the required 150 millimeters (6 inches), validate lighting levels, range supply, and exhaust system testing and commissioning.

8.3.1. The contractor shall provide, prior to final inspection, a full testing and balancing report for all supply and exhaust equipment. From the results of those
tests, determination will be made on airflow compliance set forth in the contract specification and this ETL. The balancing and testing shall be performed by a qualified testing agent in accordance with design criteria. Design criteria may include ACGIH *Industrial Ventilation: A Manual of Recommended Practice*, and NEHC-TM) 6290.99-10 Rev. 1, *Indoor Firing Ranges Industrial Hygiene Technical Guide*.

8.3.2. When the project includes additions and/or modifications to the sound-absorbing materials within the range, the contractor shall accomplish a hazardous noise survey. The initial hazardous-noise survey shall be conducted within five days of final acceptance of the range. The contractor shall coordinate with the government in advance to ensure personnel are scheduled and present to perform necessary weapons firing while the hazardous noise survey is being accomplished. Alternatively, the initial hazardous noise survey may be conducted in conjunction with the trial operations test. The initial hazardous noise survey shall be performed in accordance with requirements of DODI 6055.12, *Hearing Conservation Program (HCP)*, Air Force manual (AFMAN) 48-155, *Occupational and Environmental Health Exposure Controls* and AFOSH Standard 48-20, *Occupational Noise and Hearing Conservation Program*.

8.4. Test Fire Requirements. After construction or rehabilitation, and before conducting training and qualification operations, CA personnel must accomplish controlled test-firing using tracer ammunition. If tracer ammunition cannot be safely fired on the range, CA personnel will fire ball ammunition with witness screens to conduct the test fire. Representatives of SE and CE will act as observers. The CA instructor will use the most powerful ammunition authorized for use on the range for the test. Remove all fire hazards from the range and areas surrounding the range. Make sure firefighting equipment is immediately available when conducting range tests using tracer ammunition. Provide sandbags or other protection for the shooter during test firing. Hang witness screens of paper when firing non-tracer rounds to see if splash-back ricochets are occurring at the bullet trap when using the M855 round.

8.4.1. Non-contained Ranges. A test-fire is not required for a non-contained range. After the construction inspection confirms that the full SDZ land area is available and all barriers, fences, and signs are erected, proceed to trial operations.

8.4.2. Fully Contained Ranges. Do not test baffles with direct fire. Test baffles for direct-fired round containment before construction, as described in paragraph 8.2. To test for ricochet containment, the shooter must first fire service ammunition (non-tracer) from the prone position into the backstop and then at the floor. A test screen (witness) may be used to test the ricochet potential of the range floor. A test screen may be constructed from Celotex (National Stock Number [NSN] 5640-00-073-2803) or cardboard material, fashioned into a 1.2-meter by 1.2-meter (3.9-foot by 3.9-foot) four-sided cube. Place the test
screen at different locations on the range floor. Fire into the range floor in front of the test screen at various angles from the firing line. To determine if ricochets would have left the range, sight along a small-diameter dowel placed through ricochet holes in the screen material. Take corrective measures if the angle of departure and the sighting verifies that the bullet left the range. To determine ricochet patterns, conduct tracer tests using the same caliber of ammunition to be used on the range. Using tracer ammunition is the fastest and most efficient method of determining ricochet patterns and hazard potential.

8.5. Trial Operations. Trial operation of a new or rehabilitated range is mandatory. The CA NCOIC and installation SE representative will be present during trial operations. Document the results of the trial operations in a range trial operation report. One copy of the trial operations report must be included in the construction acceptance documentation. The CA section will retain an additional copy on file for the life of the range. Include the following items in the report:

- Date of construction completion
- Date of trial operation
- Course of fire
- Type of weapon, caliber, and ammunition used for the trial (This must be the most powerful ammunition intended for use on the range.)
- Target system functioning (may be mechanical or fixed)
- Number of shooters who fired
- Firing points used
- Damage incurred or improperly functioning items
- Initial hazardous noise survey report

9. Point of Contact. Recommendations for improvements to this ETL are encouraged and should be furnished to the Small Arms Range Program Manager, HQ AFCESA/CEOA, DSN 523-6119, commercial (850) 283-6119, e-mail AFCESARreachbackCenter@tyndall.af.mil

CLIFFORD C. FETTER, GS-15, P.E., DAF
Acting Chief, Operations & Programs Supt Div

3 Atchs
1. Minimum VDZ Height Requirements for Small Arms Ammunition at Non-contained Ranges
2. Operational Risk Management (ORM) Evaluation of Existing Range Facilities
3. Distribution List
### MINIMUM VDZ HEIGHT REQUIREMENTS FOR SMALL ARMS AMMUNITION AT NON-CONTAINED RANGES

<table>
<thead>
<tr>
<th>Weapon/Caliber</th>
<th>Ammunition</th>
<th>Maximum Ordinate of Ammunition at 30° VDZ Meters (Feet)</th>
<th>Safety Factor Meters (Feet)</th>
<th>VDZ Height in Meters (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>.22 long rifle</td>
<td></td>
<td>500 (1640)</td>
<td>175 (575)</td>
<td>675 (2215)</td>
</tr>
<tr>
<td>Handgun, .38 cal.</td>
<td>Ball M41, PGU-12/B</td>
<td>500 (1640)</td>
<td>175 (575)</td>
<td>675 (2215)</td>
</tr>
<tr>
<td>Handgun, .45 cal. pistol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submachine gun, .45 cal.</td>
<td></td>
<td>400 (1312)</td>
<td>160 (525)</td>
<td>560 (1837)</td>
</tr>
<tr>
<td>Handgun, 9mm pistol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submachine gun, 9mm</td>
<td></td>
<td>500 (1640)</td>
<td>175 (575)</td>
<td>675 (2215)</td>
</tr>
<tr>
<td>Handgun, .44 magnum</td>
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<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Shotgun, 12 gauge</td>
<td>00 buckshot</td>
<td>200 (656)</td>
<td>130 (427)</td>
<td>330 (1083)</td>
</tr>
<tr>
<td>Rifle, 5.56mm</td>
<td>Ball M193; tracer M196</td>
<td>800 (2625)</td>
<td>220 (722)</td>
<td>1020 (3347)</td>
</tr>
<tr>
<td>Rifle, 5.56mm</td>
<td>Ball M855; tracer M856</td>
<td>900 (2953)</td>
<td>220 (722)</td>
<td>1120 (3345)</td>
</tr>
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<td>Rifle, 5.56mm</td>
<td>M862 (plastic)</td>
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<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Rifle/machine gun, 7.62mm</td>
<td>Ball, M80; tracer M81</td>
<td>1100 (3609)</td>
<td>265 (869)</td>
<td>1365 (4478P)</td>
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<tr>
<td>Rifle/machine gun, 7.62mm</td>
<td>Match M118</td>
<td>1200 (3937)</td>
<td>280 (919)</td>
<td>1480 (4856)</td>
</tr>
<tr>
<td>Weapon/Caliber</td>
<td>Ammunition</td>
<td>Maximum Ordinate of Ammunition at 30° VDZ Meters (Feet)</td>
<td>Safety Factor Meters (Feet)</td>
<td>VDZ Height in Meters (Feet)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Machine gun, .50 cal.</td>
<td>Ball M2 and M33/Tracer M17/M8 API/M20 APIT</td>
<td>1600 (5248)</td>
<td>340 (1115)</td>
<td>1940 (6365)</td>
</tr>
<tr>
<td>M79 and M203, 40mm low-velocity</td>
<td>M781/M407A1/M406/M433/M381/M386/M441</td>
<td>100 (328)</td>
<td>115 (377)</td>
<td>215 (705)</td>
</tr>
<tr>
<td>MK-19, 40mm high-velocity</td>
<td>M918/M383/M430</td>
<td>500 (1640)</td>
<td>175 (575)</td>
<td>675 (2215)</td>
</tr>
<tr>
<td>M72 LAW, 35mm subcaliber</td>
<td>M73</td>
<td>300 (984)</td>
<td>145 (475)</td>
<td>445 (1460)</td>
</tr>
<tr>
<td>M72 Law, 66mm RKT HEAT</td>
<td>M72</td>
<td>200 (656)</td>
<td>280 (919)</td>
<td>480 (1575)</td>
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<tr>
<td>AT-4, 84mm RKT HEAT</td>
<td>M136</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

**Notes:**
1. VDZ in excess of 61 meters (200 feet) in height requires coordination with the local airfield manager.
2. Use a VDZ of 500 meters (1640 feet) for partially contained (baffled) ranges.
A2.1. Overview. Operational Risk Management (ORM) is a tool used to assess the risks associated with continued use of existing firing ranges that do not satisfy the minimum criteria outlined in this ETL. For further information on ORM, refer to AFI 90-901, Operational Risk Management, and AFPAM 90-902, Operational Risk Management (ORM) Guidelines and Tools. This attachment gives an example of how the ORM process can be applied to a safety evaluation of an existing range. Briefly, the ORM process can be considered to be a six-step process:

1. Identify the hazard
2. Assess the risk
3. Analyze risk-control measures
4. Make control decisions
5. Implement risk controls
6. Supervise and review

A2.2. Action Items. The six steps of the process can be broken down into several sub-steps called “actions.” A discussion of each action follows.

A2.2.1. Identify the Hazard. This step has three actions:

- Mission/task analysis (e.g., training personnel to fire weapons)
- Listing the hazards (e.g., fired rounds leaving the range)
- Listing the causes (e.g., baffles are of insufficient thickness)

Listing the causes of the hazards is the action where deficiencies or discrepancies are items found to not satisfy the ETL criteria. A tabular method for recording these actions and steps is presented in the following paragraphs.

A2.2.2. Assess the Risk. This step has three actions:

A2.2.2.1. Assess hazard severity category:

- I  Catastrophic (i.e., mission failure, death, system loss)
- II  Critical (i.e., major mission impact, severe injury, or major system loss)
- III  Moderate (i.e., minor mission impact, injury, or system damage)
- IV  Negligible (i.e., little mission impact, injury, or system damage)

A2.2.2.2. Assess the mishap probability:

- A – Frequent, daily, often, $10^{-1}$ to $10^{-4}$
- B – Likely, three weeks, occurs several times, $10^{-2}$ to $10^{-4}$
- C – Occasional, six months, will occur, $10^{-3}$ to $10^{-5}$
- D – Seldom, five years, could occur, $10^{-4}$ to $10^{-6}$
- E – Unlikely, past five years has not occurred, rarely, $10^{-5}$ to $10^{-7}$
A2.2.2.3. Assign a numerical rating based on the combination of steps A2.2.2.1 and A2.2.2.2. See Table A2.1 for the numerical value to assign to the risk.

<table>
<thead>
<tr>
<th>Severity</th>
<th>Frequent</th>
<th>Likely</th>
<th>Occasional</th>
<th>Seldom</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catastrophic I</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Critical II</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Moderate III</td>
<td>5</td>
<td>9</td>
<td>10</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Negligible IV</td>
<td>13</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>

Note: Lower numbers indicate higher risk.

A2.2.3. Analyze Risk-Control Measures. This step has three actions:

A2.2.3.1. Identify risk control options: Measures taken to mitigate the risk.

A2.2.3.2. Determine control effects: Select the control options desired for consideration.

A2.2.3.3. Determine the residual risk: Prioritize the control measures and re-score the risk based on the implemented control measures using the same procedures in paragraph A2.2.2.3.

A2.2.4. Make Control Decisions. This step has two actions:

A2.2.4.1. Select the risk control measures to implement.

A2.2.4.2. Decide whether the residual risk level is acceptable or not.

A2.2.5. Implement Risk Controls. This step has three actions:

A2.2.5.1. Make the implementation clear to all parties.

A2.2.5.2. Establish accountability and responsibility for implementing risk-control measures.

A2.2.5.3. Provide support to those tasked to implement the control measures.

A2.2.6. Supervise and Review. There are two actions in this step:

A2.2.6.1. Supervise the implementation of the control measures.
A2.2.6.2. Review the effectiveness of the control measures.

A2.3. Example. The following example shows a tabular method for performing the operational risk assessment for existing firing ranges. The example shows discrepancies taken from a real-world assessment at an Air Force base.

### BASE “X” FIRING RANGE
**OPERATIONAL RISK EVALUATION**

<table>
<thead>
<tr>
<th>Discrepancy</th>
<th>ORM STEP 1</th>
<th>ORM STEP 2</th>
<th>ORM STEP 3</th>
<th>ORM STEP 4</th>
<th>ORM STEP 5</th>
<th>ORM STEP 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hazard</td>
<td>Severity</td>
<td>Probability</td>
<td>Risk</td>
<td>Control Options</td>
<td>Residual Risk</td>
</tr>
<tr>
<td>Baffle materials do not meet ETL guidelines</td>
<td>Shoot through the baffle and bullets leave the range containment</td>
<td>I</td>
<td>C</td>
<td>6</td>
<td>Add additional thickness to baffles, or replace with correct material</td>
<td>Repair or replace will yield I,E=12</td>
</tr>
<tr>
<td>Baffle materials or slopes do not meet ETL guidelines</td>
<td>Ricochet</td>
<td>II</td>
<td>C</td>
<td>7</td>
<td>Install plywood facing on two baffles nearest the shooter, frangible ammunition</td>
<td>Install plywood facing is II,D=11, Frangible ammunition is III,E=16</td>
</tr>
<tr>
<td>Baffle materials or slopes do not meet ETL guidelines</td>
<td>Lead pollution, outside of containment</td>
<td>II</td>
<td>C</td>
<td>7</td>
<td>Lead-free ammunition, frangible ammunition</td>
<td>Lead Free is IV,E=20, Frangible ammo is III, D= 14</td>
</tr>
<tr>
<td>Side wall berm has an opening that is visible to some firing positions</td>
<td>Bullets leave the range containment</td>
<td>I</td>
<td>A</td>
<td>1</td>
<td>Fill in the opening or establish a procedure to not use those firing positions</td>
<td>Fill opening is IV,D=19, Procedure is II,E=15</td>
</tr>
<tr>
<td>Side wall berm has an opening that is visible to some firing positions</td>
<td>Lead pollution, outside of containment</td>
<td>II</td>
<td>A</td>
<td>3</td>
<td>Fill in the opening or establish a procedure to not use those firing positions; lead monitoring program; lead-free ammunition</td>
<td>Fill opening is IV,D=19, Procedure is II,E=15, Lead Monitoring is II,E=15, Lead Free Ammo is IV,E=20</td>
</tr>
<tr>
<td>Surface water runoff can leave the range</td>
<td>Lead pollution, outside of containment</td>
<td>II</td>
<td>C</td>
<td>7</td>
<td>Water monitoring program, including surface water samples and groundwater monitoring wells</td>
<td>Monitoring program is II,E=15</td>
</tr>
</tbody>
</table>
DISTRIBUTION LIST

SPECIAL INTEREST ORGANIZATIONS

Information Handling Services (1) Construction Criteria Base (1)
15 Inverness Way East National Institute of Bldg Sciences
Englewood, CO 80150 Washington, DC 20005
1. **Scope**

The results of the foundation investigation and analysis for the Small Arms Range project at Buckley Air Force Base, Aurora, Colorado are presented in this report. The scope of the study was to evaluate the engineering properties of the subsoils; provide allowable soil bearing pressures; obtain soils infiltration information for septic infiltration field design; recommend types and depths of foundation elements and other measures pertinent to foundation design and construction.

2. **Proposed Construction**

This project involves the construction of an approximately 21,600 square foot single story indoor small arms firing range. A small paved parking lot and service drives are located to the east of the building, and a septic drain field is planned to the west of the building. See attached drawing B-101 for boring locations in relation to the site plan.

3. **Subsurface Investigations**

3.1. **General**

An Omaha District drill crew conducted the field investigation for the Small Arms Range on 16 to 21 November 2016. The investigation consisted of drilling eight borings for geotechnical information for building and pavement design, and four borings for percolation tests for a septic infiltration field. Borings were located and staked in the field by plotting coordinates furnished by the project engineer. Base personnel provided utility clearances and a dig permit prior to the start of drilling. The borings were advanced with a Gus Pech 1100C truck-mounted soil-sampling rig using 4.5-inch inside diameter (I.D.) hollow stem augers with a center bit used between sampling intervals. Holes were abandoned by filling via tremie pipe placement of 3/8-
inch bentonite pellets to within 0.5 feet of the ground surface. The final 0.5 feet was backfilled with native topsoil to pre-investigation conditions. Excess drill cuttings were spread around the boring locations.

Table 1: Boring Depths, Locations, and Surface Elevations

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Total Depth (feet)</th>
<th>Northing¹</th>
<th>Easting¹</th>
<th>Ground Surface Elevation²</th>
</tr>
</thead>
<tbody>
<tr>
<td>BU16-1</td>
<td>20</td>
<td>1686000</td>
<td>3212924</td>
<td>5524.37</td>
</tr>
<tr>
<td>BU16-2</td>
<td>20</td>
<td>1686017</td>
<td>3212994</td>
<td>5522.23</td>
</tr>
<tr>
<td>BU16-3</td>
<td>20</td>
<td>1685923</td>
<td>3213062</td>
<td>5523.27</td>
</tr>
<tr>
<td>BU16-4</td>
<td>20</td>
<td>1685831</td>
<td>3213058</td>
<td>5525.68</td>
</tr>
<tr>
<td>BU16-5</td>
<td>20</td>
<td>1685832</td>
<td>3212941</td>
<td>5527.36</td>
</tr>
<tr>
<td>BU16-6</td>
<td>30</td>
<td>1685929</td>
<td>3212935</td>
<td>5525.92</td>
</tr>
<tr>
<td>BU16-7</td>
<td>10</td>
<td>1686034</td>
<td>3213159</td>
<td>5519.63</td>
</tr>
<tr>
<td>BU16-8</td>
<td>10</td>
<td>1685887</td>
<td>3213161</td>
<td>5522.86</td>
</tr>
<tr>
<td>BU16-9P</td>
<td>10</td>
<td>1686057</td>
<td>3212833</td>
<td>5524.32</td>
</tr>
<tr>
<td>BU16-10P</td>
<td>4</td>
<td>1685998</td>
<td>3212788</td>
<td>5527.07</td>
</tr>
<tr>
<td>BU16-11P</td>
<td>4</td>
<td>1686021</td>
<td>3212847</td>
<td>5525.26</td>
</tr>
<tr>
<td>BU16-12P</td>
<td>4</td>
<td>1686026</td>
<td>3212888</td>
<td>5524.26</td>
</tr>
</tbody>
</table>

² Elevations in NAVD88 (US Survey Feet).

3.2. Standard Penetration Tests

Data collected during drilling included SPTs at 2.5-foot intervals to 10 feet then at 5-foot intervals to the bottom of the boring. Standard penetration tests were performed by dropping a 140-pound hammer a distance of 30 inches to advance a two-inch-outside-diameter split spoon in accordance with ASTM D 1586-11, “Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils.”

Calibration was conducted on all USACE, Omaha District drill rigs automatic SPT hammers by the Bureau of Reclamation in June 2015. The Energy Transfer Rate (Etr) is the energy that the automatic hammer transfers to the drill rods and can be used to correct blow count (N) values to a standardized energy. The recommended Etr for the Gus Pech 1100C drill rig used is 83%.
3.3. Disturbed Sampling

Representative disturbed samples of the subsoils were taken with a 2-inch outside diameter (O.D.) standard steel split spoon sampler using a 140-pound automatic SPT hammer, in accordance with ASTM D 1586-99. Samples were collected every 2.5 feet for the first 10 feet, then every 5 feet for the remaining depth of the hole. Samples were placed in a pint jar and the lid sealed airtight with at least three wraps of electrical tape. Each jar was labeled, denoting the hole and sample number, depth, date collected, and the project name. The jars were placed in wooden boxes that labeled with the appropriate project information.

In addition to the jar samples from the SPT intervals, bulk samples were also collected from 2 to 5 feet bgs in borings BU16-3 and BU16-5. Bulk samples were obtained from the auger cuttings during drilling and each placed in two five-gallon buckets.

3.4. Undisturbed Sampling

No undisturbed samples were taken due to predominantly granular nature of site soils.

3.5. Percolation Testing

Percolation testing was performed in accordance with the Tri-County Health Department Regulation No. O-14 for On-Site Wastewater Treatment Systems. A total of four borings were drilled using the same drilling methodology outlined in Section 3.1. BU16-9P was sampled using a five-foot-long barrel sampler to collect a continuous sample down to 10 feet bgs and was logged for material descriptions and thicknesses. Borings BU16-10P through BU-12P were completed to the target depth of 4 feet bgs (proposed depth for the septic system percolation trench) and were left open with a completed 8-inch diameter borehole and with approximately 2-inches of very coarse sand placed in the bottom of the boring. The presoak period was initiated on November 16, 2016 at 1300 hours by filling the three boreholes completely with water and allowed to sit overnight. The following morning at 0800 hours, BU16-10P through BU-12P had drained of water completely but the sidewalls and backfill sand was still wet. Prior to conducting the test, the boreholes were filled once again with water and allowed to sit for an additional 4 hours to ensure that the presoak period had been adequately completed. Following the pre soak period, the percolation test commenced at approximately 1200 hours by filling the borehole with approximately 6-inches of water above the backfill sand and water level readings were completed at half-hour intervals for up to 4 hours. When necessary, water levels were topped off at the half-hour intervals after obtaining measurements in order to maintain the 6-inch head of water required for the test.

Guidance from the regulation stipulates that the percolation tests for all borings be conducted for a minimum of 2 hours and the test can be terminated if the last three successive water level drops do not vary by more than 1/16 inch (0.0625 inch). All three borehole BU16-10P, BU16-11P and
BU16-12P met the 2 hour minimum requirements. However, only the test for BU16-12P was terminated and the tests were continued for another 2 hours for borings BU16-10P and BU16-11P. The water level drops are summarized below.

Table 2. Summary of Percolation Test Results

<table>
<thead>
<tr>
<th>BU16-10P</th>
<th>BU16-11P</th>
<th>BU16-12P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Interval (Minutes)</td>
<td>Measured Water Level Drop (inch)</td>
<td>Result</td>
</tr>
<tr>
<td>43¹</td>
<td>0.0100</td>
<td>&lt; 1/16 inch drop</td>
</tr>
<tr>
<td>16²</td>
<td>0.0083</td>
<td>&lt; 1/16 inch drop</td>
</tr>
<tr>
<td>27²</td>
<td>0.0042</td>
<td>&lt; 1/16 inch drop</td>
</tr>
<tr>
<td>28²</td>
<td>0.0125</td>
<td>&lt; 1/16 inch drop</td>
</tr>
<tr>
<td>32²</td>
<td>0.0025</td>
<td>&lt; 1/16 inch drop</td>
</tr>
<tr>
<td>20²</td>
<td>0.0058</td>
<td>&lt; 1/16 inch drop</td>
</tr>
<tr>
<td>30²</td>
<td>0.0042</td>
<td>&lt; 1/16 inch drop</td>
</tr>
<tr>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Note:
< = less than
¹Time lapse from start of test
²Time lapse from previous reading
4. Laboratory Testing

Samples with transmittal sheets were shipped to the Terracon Inc. laboratory in Omaha, Nebraska. Tests were performed to determine visual classification, Atterberg Limits, grain size distribution, natural moisture content, sulfate ion content, soil pH, and soil resistivity. All tests were conducted in accordance with ASTM standards.

Based upon the results of the testing program, the field logs were revised and supplemented as shown on the boring logs. These final logs represent an interpretation and compilation of the content of the field logs and the results of the laboratory tests of the field samples. The stratification lines shown on the boring logs represent the approximate boundaries between soil types and may be gradual. Boring logs are attached to this report and are available from the Geotechnical Branch, Soils Section A, of the Omaha District.

5. Site Conditions

5.1. General Geology

The following is an excerpt from the Preliminary Assessment Report for Perfluorinated Compounds at Buckley Air Force Base, Aurora, Colorado (HGL, 2015) and discusses the regional geology in the subject area.

The geology of Buckley AFB consists of unconsolidated eolian and alluvial deposits overlying the Denver Formation (regional bedrock). These deposits range in thickness from 2 to 29 feet and consist of silty clay with occasional discontinuous layers of silty sand at the base just above the Denver Formation (URS, 2007).

The Denver Formation underlying Buckley AFB is composed of fractured and unfractured, hard, brown claystones and siltstones with occasional discontinuous lenticular beds of brown silty sandstones and dense, fine- to coarse-grained sandstones ranging in thickness from a few inches to several feet. The interbedded sandstone varies in thickness both laterally and vertically: there is no evident increase or decrease in thickness in any direction or change of depth. In general, however, sandstones encountered below 50 feet below ground surface (bgs) are coarser grained. The sandy and silty sand underbeds encountered above 50 feet bgs do not appear to be laterally continuous across the entire base, but a reasonably short distance correlation can be made between several of the interbeds (URS, 2007).

Groundwater at Buckley AFB exists within the eolian and alluvial deposits, as well as in the Denver Formation. It is primarily in the discontinuous layers of coarse-grained materials (sand and sandstones) within the fine-grained materials (clay, silt, claystones, and siltstones). Groundwater in the Denver Formation may also exist in fractured
sections of siltstones and claystones. The Laramie-Fox Hills, Arapahoe, and Denver aquifers are three principal bedrock aquifers at Buckley AFB. Regional ground water flow is generally to the northwest, following the trend of stream drainages toward the South Platte River north of Denver (URS, 2007).

5.2. Site-Specific Geology

Based on the drilling logs, the geologic conditions encountered in the borings advanced for this investigation are consistent with the regional geology discussion presented above. Materials encountered in the nine borings (BU16-1 through BU16-9P) consisted of typically stiff to very stiff fine-grained materials, lean clay with sand in the upper shallow soils. The consistent description of lean clay with sand in borings BU16-1 through BU16-9P would likely be noted in borings BU16-10 thru BU16-12 if logged. Clayey sand (SC) was encountered at depths between 5 and 11.5 feet bgs and was generally consistent with thin clay lenses down to weathered bedrock at approximately 17-19.6 feet bgs. In general, material stiffness/density increased with depth and refusal was not encountered in any of the SPT intervals. Generally, materials were dry nearer the surface and increased in moisture content with depth to moist. BU16-1 and BU16-5 were the only borings where the clayey sand was observed to be wet/saturated just above the weathered bedrock, at 18.5 feet bgs for both borings.

Weathered bedrock (claystone or shale) was encountered from a depth of approximately 17 to 30 feet (bgs) in the borings advanced for this investigation. Weathered bedrock was typically grey, soft, weak, and highly weathered with no visible bedding planes and blocky. Weathered bedrock appears to be continuous across the project site. Competent bedrock was not encountered in the borings.

Table 3. Depth to weathered bedrock

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Depth to Weathered Bedrock (feet)</th>
<th>Depth to Competent Bedrock (feet)</th>
<th>Total Depth (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BU16-1</td>
<td>19.6</td>
<td>Not Encountered</td>
<td>20</td>
</tr>
<tr>
<td>BU16-2</td>
<td>17.5</td>
<td>Not Encountered</td>
<td>20</td>
</tr>
<tr>
<td>BU16-3</td>
<td>17</td>
<td>Not Encountered</td>
<td>20</td>
</tr>
<tr>
<td>BU16-4</td>
<td>17</td>
<td>Not Encountered</td>
<td>20</td>
</tr>
<tr>
<td>BU16-5</td>
<td>19.4</td>
<td>Not Encountered</td>
<td>20</td>
</tr>
<tr>
<td>BU16-6</td>
<td>17</td>
<td>Not Encountered</td>
<td>30</td>
</tr>
<tr>
<td>BU16-7</td>
<td>Not Encountered</td>
<td>Not Encountered</td>
<td>10</td>
</tr>
<tr>
<td>BU16-8</td>
<td>Not Encountered</td>
<td>Not Encountered</td>
<td>10</td>
</tr>
<tr>
<td>BU16-9P</td>
<td>Not Encountered</td>
<td>Not Encountered</td>
<td>10</td>
</tr>
</tbody>
</table>
5.3. Ground Water

Ground water was reported in two borings during drilling, at a depth of 18.5 feet, immediately above the contact with weathered bedrock. Boring BU16-1 had a wet layer at this depth, but no detectable water was found at the completion of drilling. Ground water was measured in three of the borings after the completion of drilling as shown in table below.

Table 4. Ground water information

<table>
<thead>
<tr>
<th>Boring No.</th>
<th>Depth Groundwater Encountered (feet)</th>
<th>Groundwater Depth at Completion of Drilling (feet)</th>
<th>Total Depth (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BU16-1</td>
<td>18.5</td>
<td>Dry</td>
<td>20</td>
</tr>
<tr>
<td>BU16-2</td>
<td>Not Encountered</td>
<td>Dry</td>
<td>20</td>
</tr>
<tr>
<td>BU16-3</td>
<td>Not Encountered</td>
<td>Dry</td>
<td>20</td>
</tr>
<tr>
<td>BU16-4</td>
<td>Not Encountered</td>
<td>17.6</td>
<td>20</td>
</tr>
<tr>
<td>BU16-5</td>
<td>18.5</td>
<td>17.8</td>
<td>20</td>
</tr>
<tr>
<td>BU16-6</td>
<td>Not Encountered</td>
<td>19</td>
<td>30</td>
</tr>
<tr>
<td>BU16-7</td>
<td>Not Encountered</td>
<td>Dry</td>
<td>10</td>
</tr>
<tr>
<td>BU16-8</td>
<td>Not Encountered</td>
<td>Dry</td>
<td>10</td>
</tr>
<tr>
<td>BU16-9P</td>
<td>Not Encountered</td>
<td>Dry</td>
<td>10</td>
</tr>
</tbody>
</table>

5.4. Seismic Evaluation

In reference to the American Society of Civil Engineers “Minimum Design Loads for Buildings and other Structures (ASCE 7-10),” the Department of Defense (DoD) “Unified Facilities Criteria (UFC) Seismic Design for Buildings (UFC 3-310-04) dated 1 May 2012, and the International Building Code (IBC) 2012, Buckley AFB has a 0.2-second spectral response acceleration (Ss) of 0.190 g and a 1.0-second spectral response acceleration (S1) of 0.055 g.

These accelerations are interpolated from 1:5,000,000 scale maps prepared by the U.S. Geological Survey (USGS), the Building Seismic Safety Council (BSSC), and the ASCE 7 Seismic Subcommittee for 0.2-second spectral response acceleration (5% critical damping), Site Class B, and 1.0-second spectral response acceleration (5% critical damping), Site Class B, respectively. These accelerations were confirmed by using the USGS Seismic Design Maps

For all structures located within regions of the maps having $S_s$ values greater than 0.15 g, or values of $S_1$ greater than 0.04 g, the spectral response accelerations taken from these maps must be adjusted for site class effects using coefficients provided in the aforementioned guidance. Chapter 20 of ASCE 7-10, Site Classification, provides six site classes, Class A through Class F, which are defined on various geotechnical parameters (shear wave velocity, standard penetration resistance, or undrained shear strength). For this investigation, shear wave velocity and undrained shear strength were not determined. Therefore, the site classification is based on standard penetration resistance (i.e., SPT blow counts). For design purposes, the reference site condition for this project is taken as site class D. This is based on the limited standard penetration resistance (ASTM D 1586) data (eight soil borings) collected during this investigation.

Chapter 20 of ASCE 7-10 defines a site class D site as having an average standard penetration resistance $(N)$ of 15–50 for the top 100 feet of the site profile. The $(N)$ value for the three borings greater than 10 feet deep for the site is 28.

The adjusted maximum considered earthquake spectral response acceleration parameters (USGS values) using the site class D response coefficients (for $S_s \leq 0.25$ and $S_1 \leq 0.10$) are:

The short-period spectral acceleration ($S_{MS} = F_a S_s$) is $(1.6 \times 0.190) = 0.303$

The 1-second period spectral acceleration ($S_{M1} = F_v S_1$) is $(2.4 \times 0.055) = 0.131$

### Summary of Seismic Design Parameters

<table>
<thead>
<tr>
<th>Site Location</th>
<th>N (blows/ft)</th>
<th>Site Class</th>
<th>PGA (g)</th>
<th>$S_s$ (g)</th>
<th>$S_1$ (g)</th>
<th>$F_a$</th>
<th>$F_v$</th>
<th>$S_{MS}$</th>
<th>$S_{M1}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT NAME, BASE NAME, LOCATION</td>
<td>28</td>
<td>D</td>
<td>0.102</td>
<td>0.190</td>
<td>0.055</td>
<td>1.6</td>
<td>2.4</td>
<td>0.303</td>
<td>0.131</td>
</tr>
</tbody>
</table>

6. **Subsurface Recommendations**

6.1. **General**

Soils at the project site consist primarily of lean clay with sand, sandy lean clay and lean clay overlying clayey sand, with high plasticity clay immediately overlying weathered bedrock. High plasticity clay (liquid limit greater than 50) is predominantly located below the depth of typical excavations at this site but should not be used for structural fill or backfill material. Prior to
adding fill to the site, topsoil should be stripped and the subgrade soils scarified and recompacted. A slope of at least 2 percent and preferably 5 percent should be maintained within 10 feet of structures to ensure adequate drainage.

6.2. Foundation Recommendations

6.2.1. Shallow Spread and Continuous Footings

The recommended foundation type for this design is shallow spread and continuous footings bearing on native material. Footings should be designed for an allowable excess bearing capacity of 2500 psf. This value represents the maximum allowable bearing pressure at the base of the footings in excess of that due to existing surrounding overburden. Subgrade below all footings to a distance of 18 inches beyond the outer perimeter of the footing is to be removed to a depth of 18 inches, moisture-conditioned to within a range of -1 to +2 percent of optimum moisture content, placed in lifts with a maximum loose thickness of 10 inches, and compacted to between 92 and 95 percent of maximum Modified Proctor density. Prepared subgrades must be protected from moisture gain or loss prior to footing placement and backfilling.

All exterior footings for heated structures should be founded a minimum of 3.0 feet below final exterior grade to provide adequate frost protection.

All footings for unheated structures should be founded a minimum of 3.5 feet below final exterior grade to provide adequate frost protection.

6.3. Slabs on Grade

Floor slabs on-grade are to be placed on a layer of soil scarified to a depth of 8 inches, moisture-conditioned to between -1 and +2 percent of optimum, and compacted to not less than 92 percent of maximum Modified Proctor density. Slabs on subgrade prepared as described may be designed for a coefficient of subgrade reaction of 150 pci (without frost protection).

A vapor-retarding membrane overlying a six-inch capillary water barrier is required beneath all floor slabs on grade.

6.4. Pavement Design

Soil underlying pavement is predominantly sandy clay and lean clay with sand. These soils have a frost design classification of F3.

If rigid pavement design does not consider frost penetration, a modulus of subgrade reaction "K" of 150 pci is recommended for design purposes. Flexible pavement designs should use a
California Bearing Ratio (CBR) value of 6 for subgrade compacted to 95 percent of maximum density per ASTM D 1557, Modified Proctor Density, when frost is not allowed to penetrate the subgrade. If frost penetration is considered in the design of rigid or flexible pavements, the design shall be in accordance with UFC 3-260-02 Pavement Design for Airfields.

6.5. Settlement

Based on Standard Penetration Test results and experience with similar conditions, total settlement should not exceed 1.0 inch under the recommended loading and subgrade preparation conditions. Differential settlement should not exceed 0.50 inch under such conditions.

6.6. Cementing Properties

Sulfate ion content tests were performed on representative samples from site borings. Test results indicated a sulfate ion content of between less than 0.1 and 0.32 percent. Based on criteria outlined in ACI 201.2, a moderate to severe exposure condition exists. Concrete in direct contact with soil or ground water shall be subject to the following criteria.

Portland cement will be ASTM C 150:

A. Type V, or

B. Type II having a tricalcium-aluminate content of less than 5 percent, or meeting the optional physical requirement for sulfate expansion for Type V cement on Table 4, ASTM C 150, or

C. Type II blended with a pozzolan meeting the requirements of ASTM C 618, Type F.

In addition, sulfate-resistant concrete will have a water-cement ratio of less than 0.45. Calcium chloride or admixtures containing the chloride ion will not be permitted in sulfate-resistant concrete. The curing time for sulfate-resistant concrete will be 12 days.

Concrete protected from direct contact with soil or ground water by a waterproof coating is not required to contain sulfate-resistant cement. Likewise, concrete pavement will not require sulfate-resistant cement if it is isolated from the subgrade by a base course.

Due to the potential for alkali-aggregate reactivity within the boundaries of the Omaha District, cement meeting the optional chemical requirements for low alkali cement on Table 2, ASTM C 150 will also be specified for all concrete. The Resource Conservation Recovery Act (RCRA) mandates, where possible, all concrete specifications will also include the option to use pozzolan as a partial replacement for Portland cement.
6.7. Corrosion Potential

Soil resistivity tests were performed on representative samples from borings as shown on the boring log sheets. Test results indicated a resistivity of less than 500 ohm-cm. In accordance with corrosion classifications in the Department of the Army TM 5-811-7 Electrical Design, Cathodic Protection (22 April 1985), a "severe" corrosion potential is expected. Soil pH measured between 8.0 and 8.2.

6.8. Design and Construction Considerations

If the design changes from current plans, Soils A Section is to be contacted to determine if the directions and recommendations in this report need to be amended.

The low humidity and windy conditions often present along the Front Range will dry subgrade quickly, exposed soil must be protected from moisture loss, or gain from the afternoon thunderstorms that occur during the spring and summer.
<table>
<thead>
<tr>
<th>ELEV.</th>
<th>BU16-01</th>
<th>BU16-02</th>
<th>BU16-03</th>
<th>BU16-04</th>
<th>BU16-05</th>
<th>BU16-06</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>19.4</td>
<td>19.1</td>
<td>16</td>
<td>19</td>
<td>15.8</td>
<td>17.8</td>
</tr>
<tr>
<td>LL</td>
<td>46.25</td>
<td>28.6</td>
<td>21.5</td>
<td>38.7</td>
<td>32.47</td>
<td>30.5</td>
</tr>
</tbody>
</table>

**BU16-01**
- **ELEV.**: 5524.38
- **Type**: Lean Clay with Sand
- **Color**: Light gray, very stiff, fine sand, trace medium sand, dry, trace white mineralization
- **Weight**: 15.4
- **pH**: 6.4

**BU16-02**
- **ELEV.**: 5522.24
- **Type**: Lean Clay with Sand
- **Color**: Light gray, very stiff, fine sand, trace medium sand, dry, trace white mineralization
- **Weight**: 6.1
- **pH**: 6.4

**BU16-03**
- **ELEV.**: 5523.38
- **Type**: Lean Clay with Sand
- **Color**: Light gray, very stiff, fine sand, trace medium sand, dry, trace white mineralization
- **Weight**: 7.3
- **pH**: 8.3

**BU16-04**
- **ELEV.**: 5526.69
- **Type**: Lean Clay with Sand
- **Color**: Light gray, very stiff, fine sand, trace medium sand, dry, trace white mineralization
- **Weight**: 8.0
- **pH**: 8.0

**BU16-05**
- **ELEV.**: 5527.36
- **Type**: Lean Clay with Sand
- **Color**: Light gray, very stiff, fine sand, trace medium sand, dry, trace white mineralization
- **Weight**: 8.5
- **pH**: 8.5

**BU16-06**
- **ELEV.**: 5525.92
- **Type**: Lean Clay with Sand
- **Color**: Light gray, very stiff, fine sand, trace medium sand, dry, trace white mineralization
- **Weight**: 8.5
- **pH**: 8.5

**CLAYEY SAND**
- **Color**: Yellow brown, medium dense, 13% fines, 45% medium sand, 30% sand, dry to moist, trace white mineralization
- **Weight**: 13.8
- **pH**: 9.0

**FAT CLAY (WEATHERED SHALE)**
- **Color**: Yellow brown, hard, fine sand, trace medium sand, moist, iron oxide and manganese staining
- **Weight**: 19.7

**FAT CLAY WITH SAND (WEATHERED SHALE)**
- **Color**: Yellow brown, hard, fine sand, trace medium sand, moist, iron oxide and manganese staining
- **Weight**: 25.8

**FAT CLAY (WEATHERED SHALE)**
- **Color**: Yellow brown, hard, fine sand, trace medium sand, moist, iron oxide and manganese staining
- **Weight**: 26.1

**FAT CLAY WITH SAND**
- **Color**: Yellow brown, hard, fine sand, trace medium sand, moist, iron oxide and manganese staining
- **Weight**: 25.9

**SAND**
- **Color**: Pale yellow, hard, fine sand, trace medium sand, moist, iron oxide and manganese staining
- **Weight**: 25.9

**SAND (WEATHERED SHALE)**
- **Color**: Pale yellow, hard, fine sand, trace medium sand, moist, iron oxide and manganese staining
- **Weight**: 29.9
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