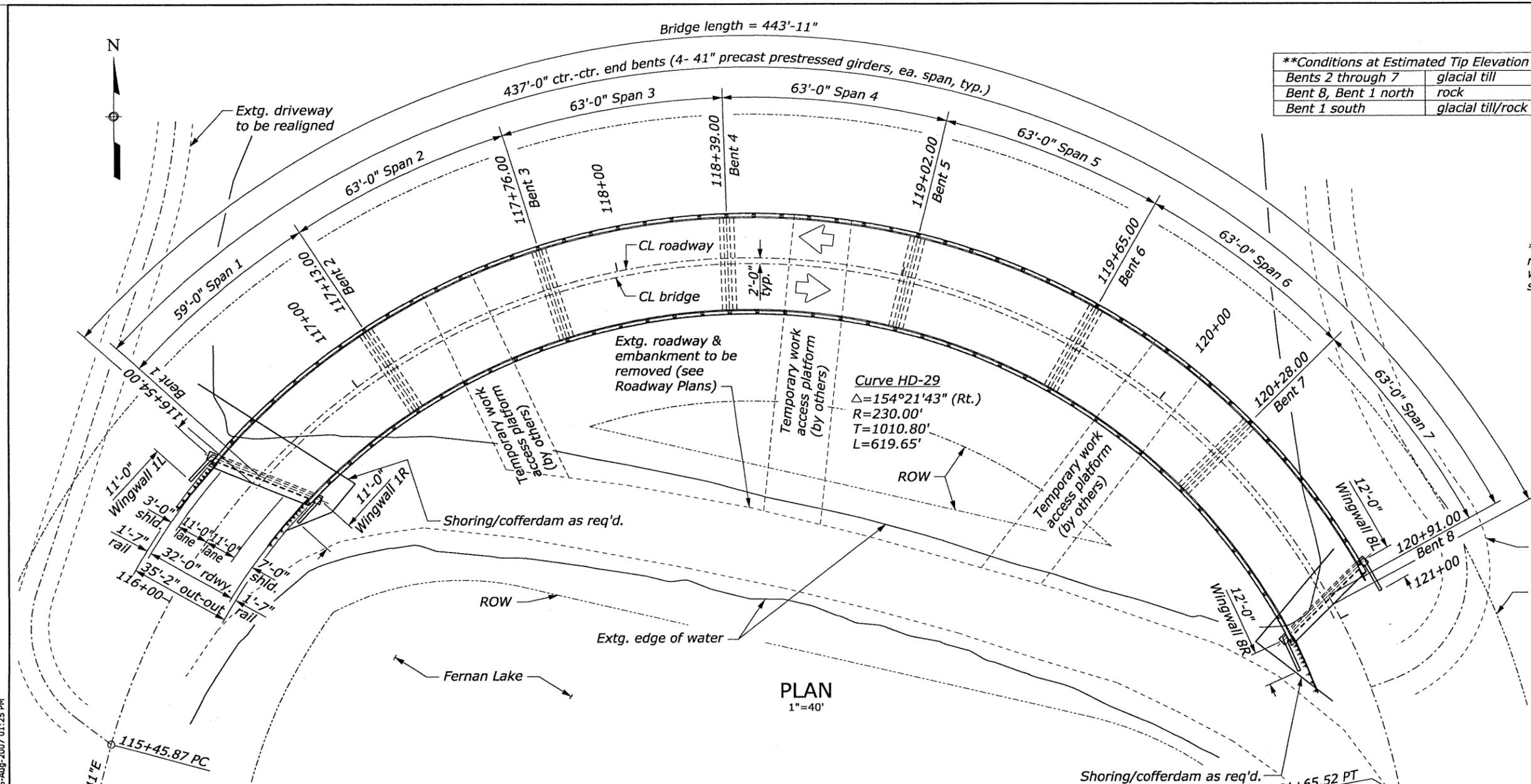
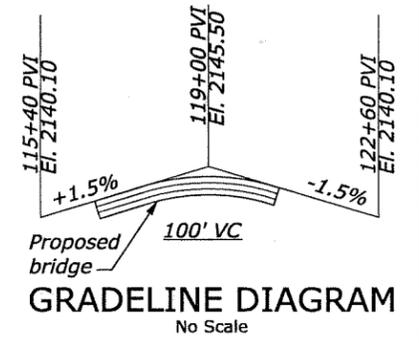


STATE	PROJECT	SHEET NUMBER
ID	PFH 80-1(1)	P.1

<b>**Conditions at Estimated Tip Elevation</b>	
Bents 2 through 7	glacial till
Bent 8, Bent 1 north	rock
Bent 1 south	glacial till/rock

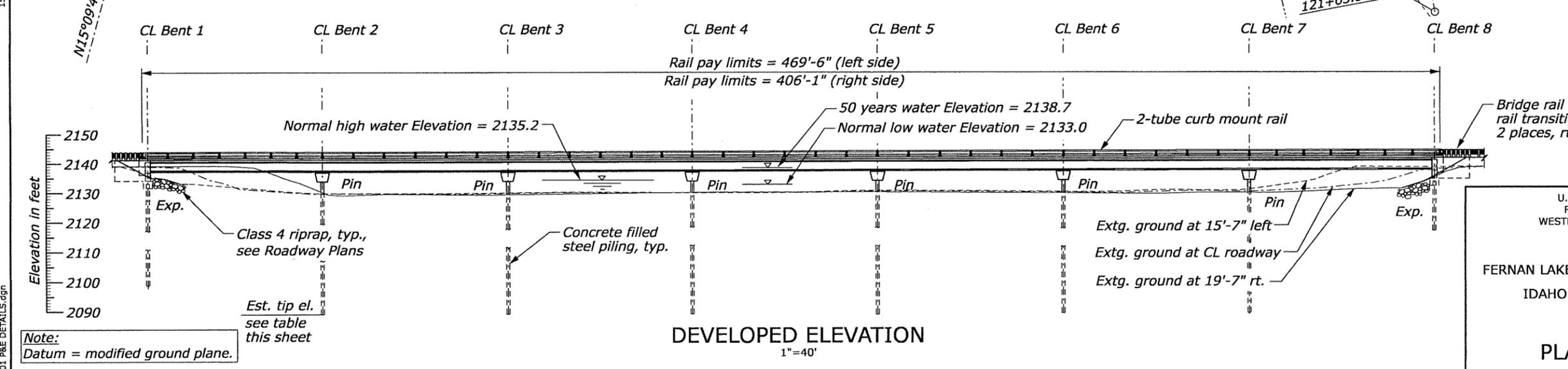
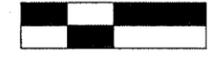
<b>**Estimated Tip Elevations</b>	
Bent 1 (Lt.)	El. 2107
Bent 1 (Rt.)	El. 2097
Bent 2	El. 2080
Bent 3	El. 2070
Bent 4	El. 2053
Bent 5	El. 2065
Bent 6	El. 2090
Bent 7	El. 2115
Bent 8 (Lt.)	El. 2128*
Bent 8 (Rt.)	El. 2114

\* Shallow rock encountered that will likely require drilling and grouting to secure pile with minimum embedment of 10' and socket of 3'



**PRELIMINARY**

**WARNING:**  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



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**PLAN AND ELEVATION**

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								ERIC E. BONN, P.E.	RG & HS	PGS/NPR	AS NOTED	G. GIFFORD	1 of 46	JUNE 2007	RG2845-A

**GENERAL NOTES:**

**DESIGN SPECIFICATIONS:** AASHTO LRFD Bridge Design Specifications, Third Edition, as amended by the 2003-2006 Interim Revisions.

**CONSTRUCTION:** Federal Highway Administration Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-03.

**DEAD LOAD:**  
**CONCRETE:** 145 pounds per cubic foot for cast-in-place concrete.  
**FUTURE PAVING ALLOWANCE:** 50 pounds per square foot of roadway surface.  
**BRIDGE RAIL:** 163 pounds per linear foot.

**LIVE LOAD:**  
 HL-93, Impact=1.33.

**DESIGN CRITERIA:** Prestressed and plain reinforced concrete designed by load and resistance LRFD design. Current AASHTO specification values used for all other reinforced concrete elements.

**CAST-IN-PLACE CONCRETE:**  
 All concrete, except in piling, shall be structural concrete Class A(AE) with a minimum 28-day compressive strength  $f'_c=4000$  psi. Concrete in pipe piling shall be Class B with a minimum 28-day compressive strength  $f'_c=2400$  psi. All cast-in-place concrete, except that in the pipe piles, shall be vibrated and shall contain an approved air-entraining admixture. Chamfer exposed edges of all concrete  $\frac{3}{4}$ ", unless noted otherwise on the plans. No additives containing calcium chloride shall be used in any concrete. All substructure concrete shall be made with Type II cement. All cement shall be low alkali cement. Expansion joint filler shall meet the requirements of AASHTO M213, (ASTM D1751).

**PRECAST CONCRETE:**  
 Shall be Class HPC with compressive strengths as listed on Dwg. RG-2845-O.

**REINFORCING STEEL:**  
 All reinforcing steel shall conform to ASTM specification A706 or AASHTO A31 (ASTM A615), Grade 60 deformed. All field bent bars shall be ASTM A706. The minimum concrete covering to the face of any bar shall be 2", unless shown otherwise on the plans. Minimum splice lengths for all bar sizes shall be as shown on the plans. Bar splices other than those shown on the plans will not be paid for.

**STRUCTURAL STEEL:**  
 The steel fabricator shall be fully certified in Simple Steel Bridges Structures (Sbr) under AISI Quality Certification Program. Rail elements shall be square structural tubing conforming to ASTM Specification A500 grade B, A618 or A501. Steel posts and plates in rails shall conform to ASTM Specification A36 unless otherwise noted. All structural steel including fasteners shall be hot-dip galvanized after fabrication, except as noted. Galvanized-Control Silicon means silicon content of 0% to 0.04% or 0.15% to 0.25%.

*Reinforcing Splice Length (Class B) Grade 60											
Bar Size		3	4	5	6	7	8	9	10	11	14 & 18
Splice Length	Uncoated	1'-0"	1'-4"	1'-8"	2'-0"	2'-7"	3'-5"	4'-4"	5'-6"	6'-9"	Not permitted
	Epoxy coated	1'-2"	1'-7"	2'-0"	2'-4"	3'-1"	4'-1"	5'-2"	6'-6"	8'-0"	Not permitted

\*Increase the splice lengths by ALL the applicable percentages:  
 40% for locations with 12" or more of fresh concrete placed below  
 30% for regions with more than 50% of bars spliced in one splice region  
 25% (epoxy only) for locations with less than  $3d_b$  of cover or  $6d_b$  clear spacing or both  
 Percentage need not exceed 40% for epoxy bars

**WELDING:**  
 All welding shall conform to the AWS D1.1 Bridge Welding Code, current edition.

**ANCHORS:**  
 Anchor rods shall conform to ASTM A449, unless noted otherwise in the plans, and shall be hot-dip galvanized after fabrication.

**STEEL PILES:**  
 See drawing RG2845-C for pile material requirements. Piles are to be driven to the minimum tip elevation and to the depth required to obtain the ultimate pile capacity as shown on the plans. All pipe piles shall be filled with concrete after driving. All pipe piles shall have conical drive points. All H-piles shall have driving shoes. See "Special Contract Requirements".

**GEOTECHNICAL REPORT:**  
 For boring logs and other geotechnical information see Geotechnical Report No. 26-06 dated November 20, 2006 and supplemental memo dated August 1, 2007 prepared by NTL Engineering & Geoscience, Inc., Great Falls, Montana.

**GEOMETRY:**  
 All plan dimensions shown are measured horizontally or vertically unless otherwise noted and reflect the ultimate geometric shape and location of all elements at a mean structure temperature of 60° F.

**MISCELLANEOUS:**  
 See detail plans for additional requirements on bearings, expansion joints and bridge railing.

**ESTIMATE**

Item No.	Description	Units	Quantities	Notes
20810-0000	Shoring and bracing	lump sum		
20815-0000	Cofferdams	lump sum		
25101-4000	Placed riprap, Class 4	cubic yard		(3)
55101-0200	Concrete filled steel pipe piles, in place	foot	2469	(2)
55101-1100	Steel H piles, in place	foot	228	
55116-0000	Splices	each	8	
55201-0200	Structural concrete, Class A(AE)	cubic yard	664	(1)
55302-3200	Precast, prestressed concrete girders, 42"	feet	1717	(1)
55401-1000	Reinforcing steel	lbs.	142800	(1)
55601-1100	Bridge railing, steel, two rail	foot	876	(1)
56401-1000	Bearing device, elastomeric	each	8	(1)
57502-0000	Temporary bridge workpads	lump sum		

Bottom of Beam Elevations (feet)				
Bent	Girder			
	A	B	C	D
1	2137.81	2137.48	2137.16	2136.83
2	2138.76	2138.39	2138.03	2137.67
3	2139.70	2139.33	2138.97	2138.61
4	2140.65	2140.28	2139.92	2139.56
5	2141.18	2140.81	2140.45	2140.09
6	2140.59	2140.22	2139.86	2139.50
7	2139.64	2139.27	2138.91	2138.55
8	2138.72	2138.33	2137.95	2137.56

**Notes:**

- (1) Contract Quantity.
- (2) Includes cost of furnishing and installing reinforced conical pile tips and supplying and placing Class B concrete.
- (3) See Roadway Plans for riprap, Class 4, quantities.

**Notes:**

- All stations and elevations are in feet.
- All bridge dimensions are in feet and/or inches.

**WARNING:**  
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



**PRELIMINARY**



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**NOTES AND ESTIMATE**

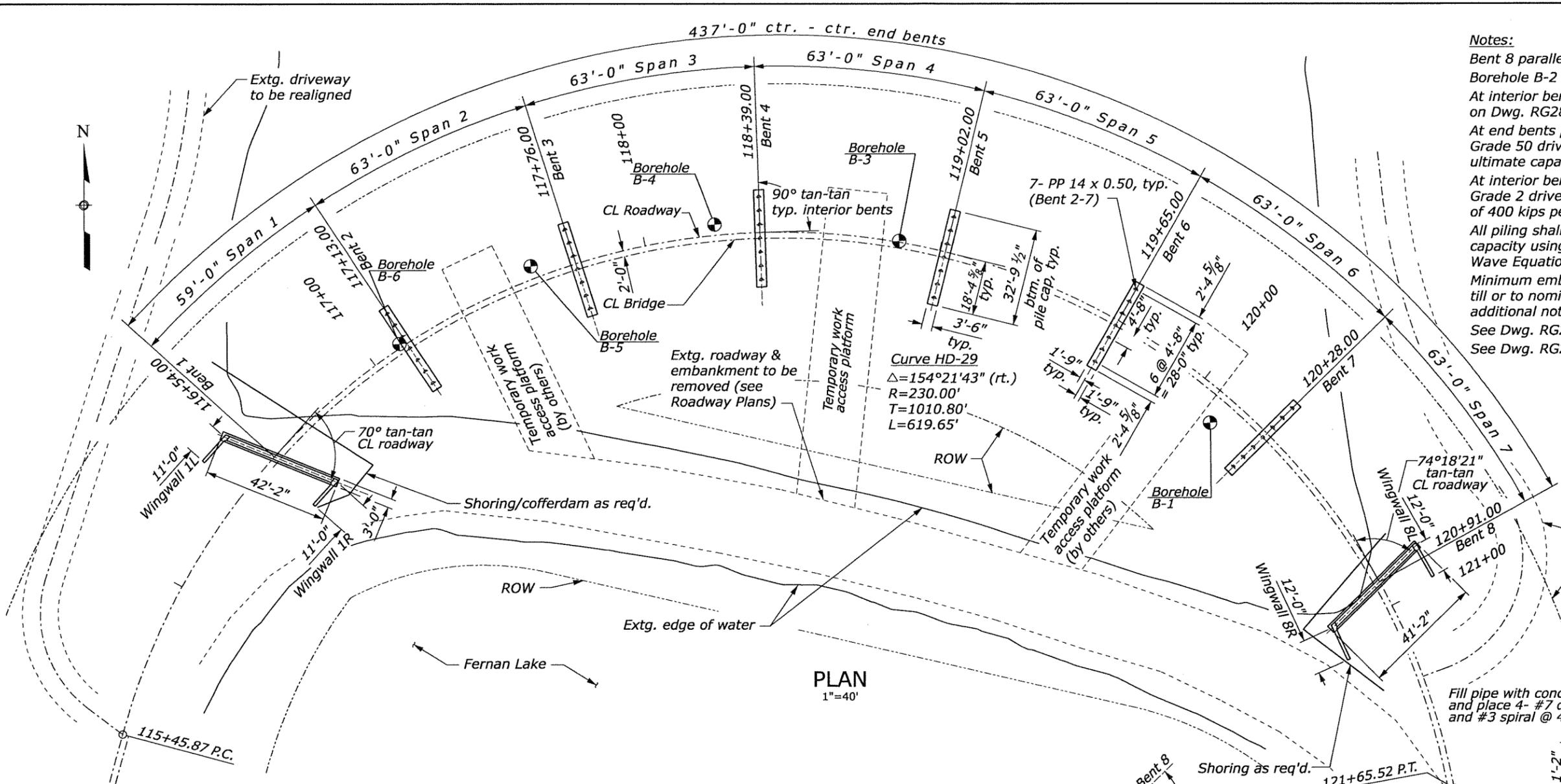
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 ..1510.12.02 GENERAL NOTES & ESTIMATE

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								ERIC E BONN, P.E.	DEB HINES/RG		AS NOTED	G. GIFFORD	2 of 46	JUNE 2007	RG2845-B

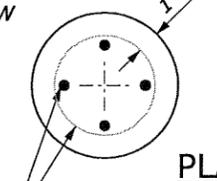
STATE	PROJECT	SHEET NUMBER
ID	PFH 80-1(1)	P.3

**Notes:**  
 Bent 8 parallel to Bent 7.  
 Borehole B-2 omitted.  
 At interior bents, batter exterior piles as shown on Dwg. RG2845-U.  
 At end bents provide HP14 x 73, ASTM A572, Grade 50 driven with reinforced driving tip to an ultimate capacity of 250 kips per pile.  
 At interior bents provide PP14 x 0.50, ASTM A252, Grade 2 driven closed-ended to an ultimate capacity of 400 kips per pile.  
 All piling shall be driven to the specified ultimate capacity using driving criteria developed from a Wave Equation analysis with a factor of 2.5.  
 Minimum embedment shall be 12 feet into glacial till or to nominal sound rock contact at Bent 8. See additional note on RG2845-A.  
 See Dwg. RG2845-A for estimated pile tip elevations.  
 See Dwg. RG2845-GG for additional pile details.

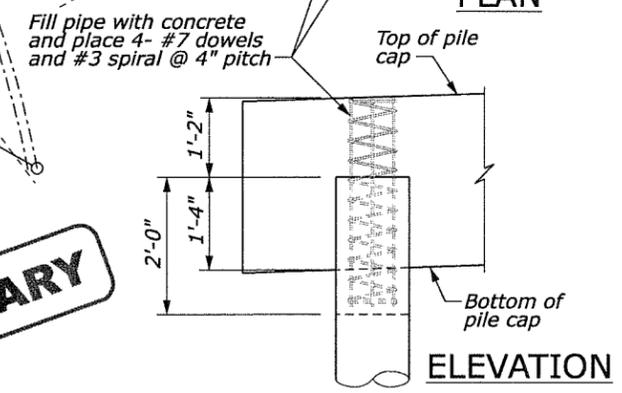
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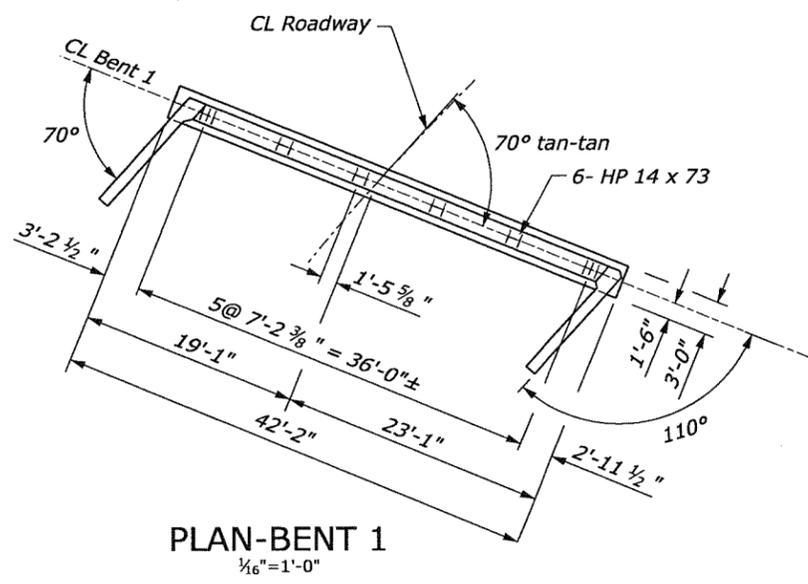
**PLAN**  
 1"=40'



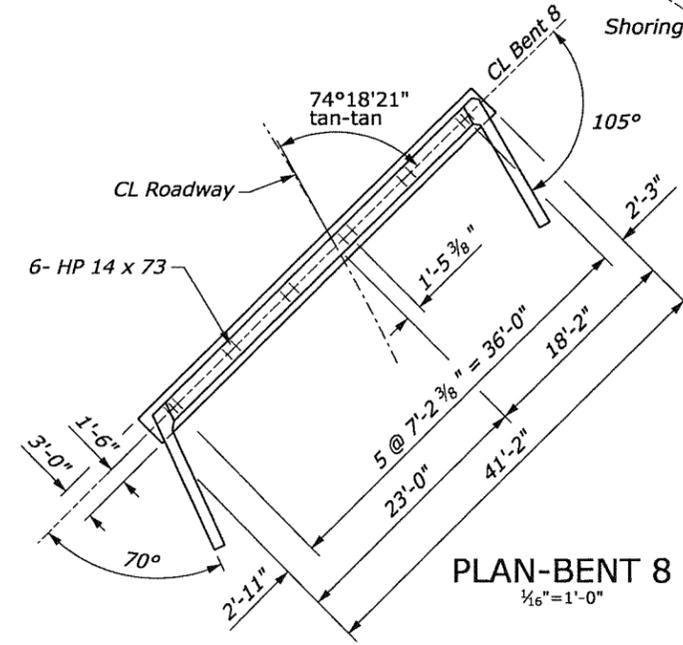
**PLAN**



**FILLED PIPE PILE ANCHOR DETAILS**  
 No Scale

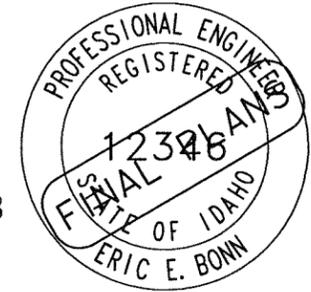


**PLAN-BENT 1**  
 1/16"=1'-0"



**PLAN-BENT 8**  
 1/16"=1'-0"

**PRELIMINARY**



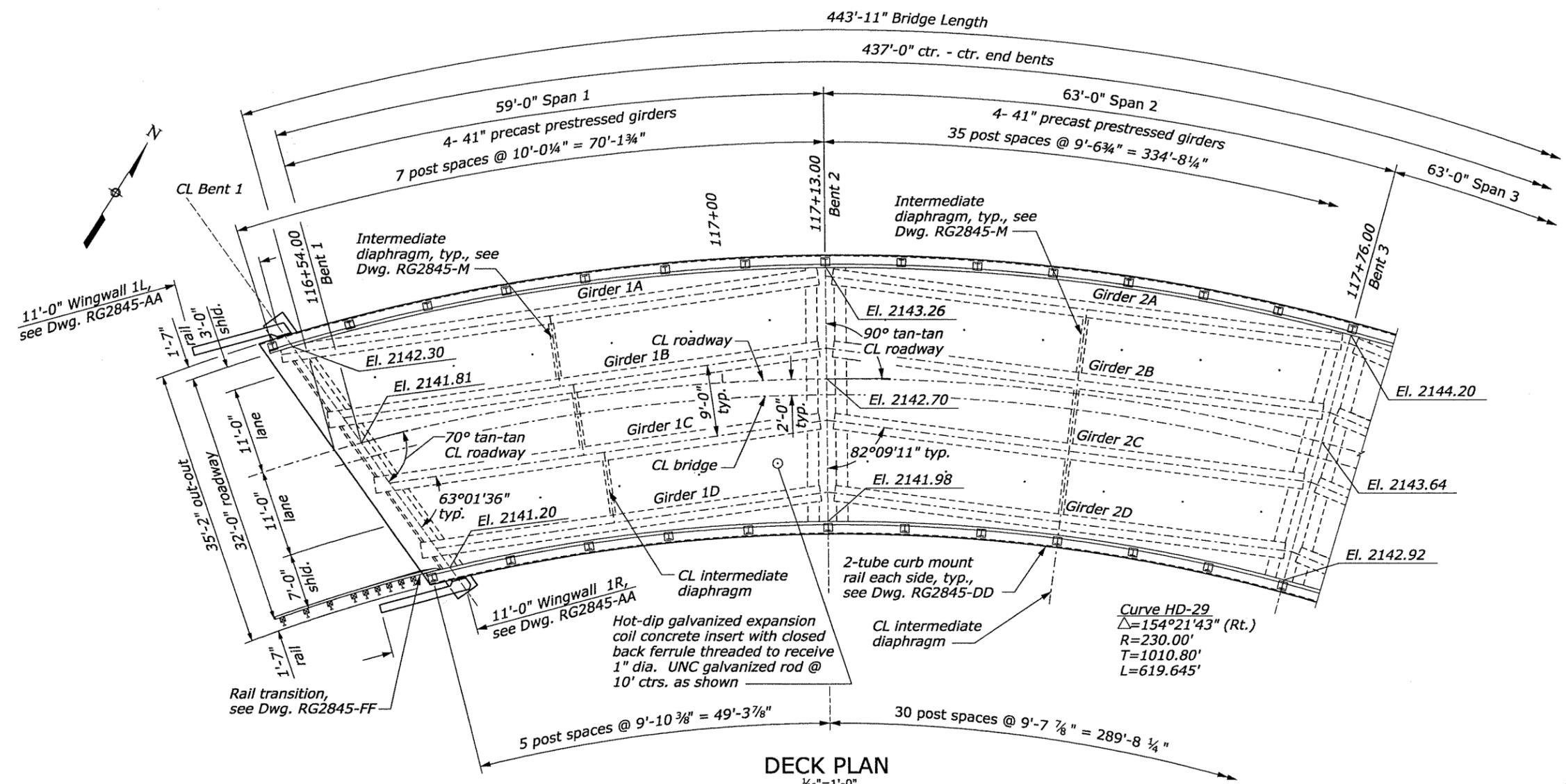
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**FOUNDATION PLAN**

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 ...1551012\_03 FOUNDATION PLAN.dgn

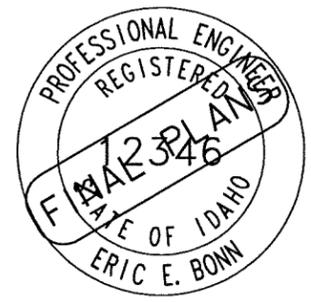
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								ERIC E. BONN, P.E.	HEIDI SKEEN		AS NOTED	G. GIFFORD	3 of 46	JUNE 2007	RG2845-C



**Notes:**  
 Elevations shown are finish grade top of concrete at center line of bent at gutter line and at roadway center line.  
 See Dwg. RG2845-G through L for deck reinforcement.

**PRELIMINARY**

**WARNING:**  
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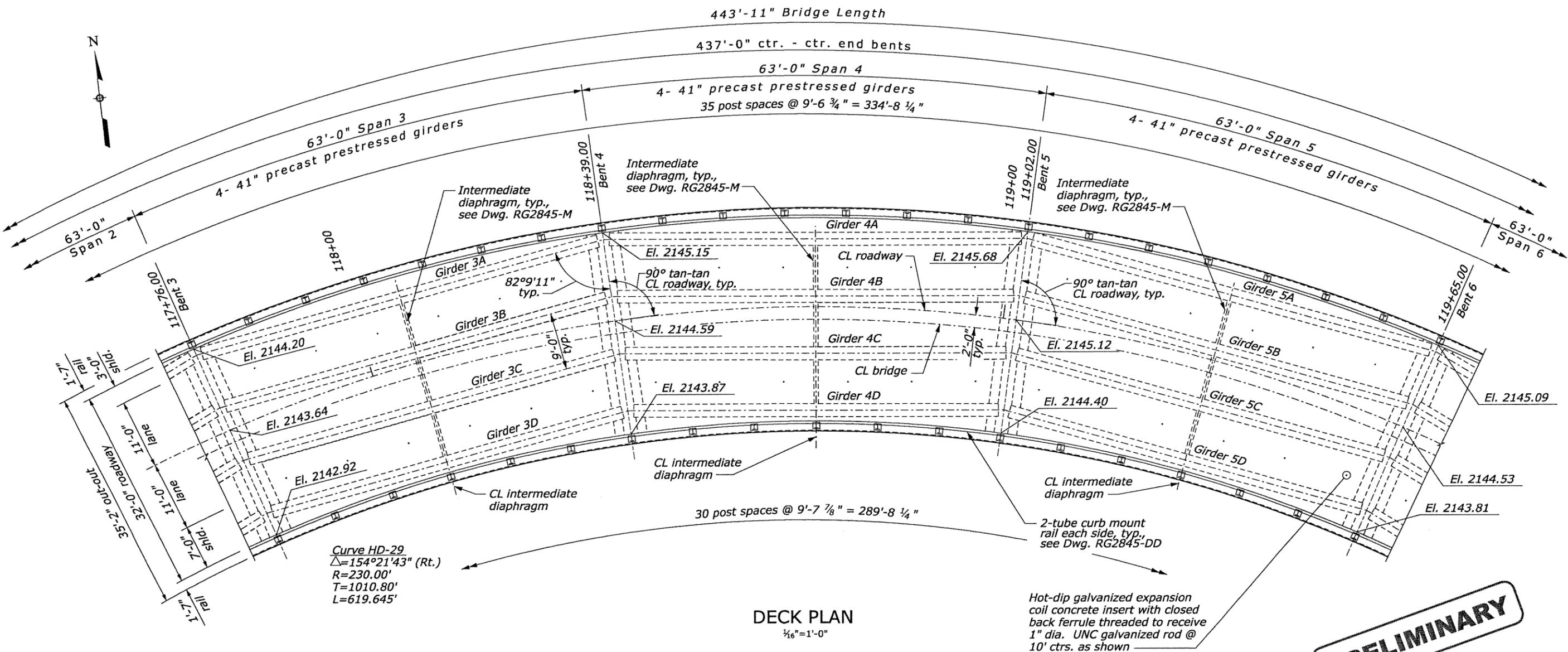
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**DECK PLAN - SPANS 1 & 2**

15-AUG-2007 01:27 PM  
 ...1551012\_04 DECK SPAN 1 & 2.dgn

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								ERIC E. BONN, P.E.	HEIDI SKEEN		1/16"=1'-0"	G. GIFFORD	4 of 46	JUNE 2007	RG2845-D



DECK PLAN  
1/8"=1'-0"

Curve HD-29  
 $\Delta=154^{\circ}21'43"$  (Rt.)  
 $R=230.00'$   
 $T=1010.80'$   
 $L=619.645'$

**Notes:**  
 Elevations shown are finish grade top of concrete at center line of bent at gutter line and at roadway center line.  
 See Dwg. RG2845-G through L for deck reinforcement.

Hot-dip galvanized expansion coil concrete insert with closed back ferrule threaded to receive 1" dia. UNC galvanized rod @ 10' ctrs. as shown

**PRELIMINARY**

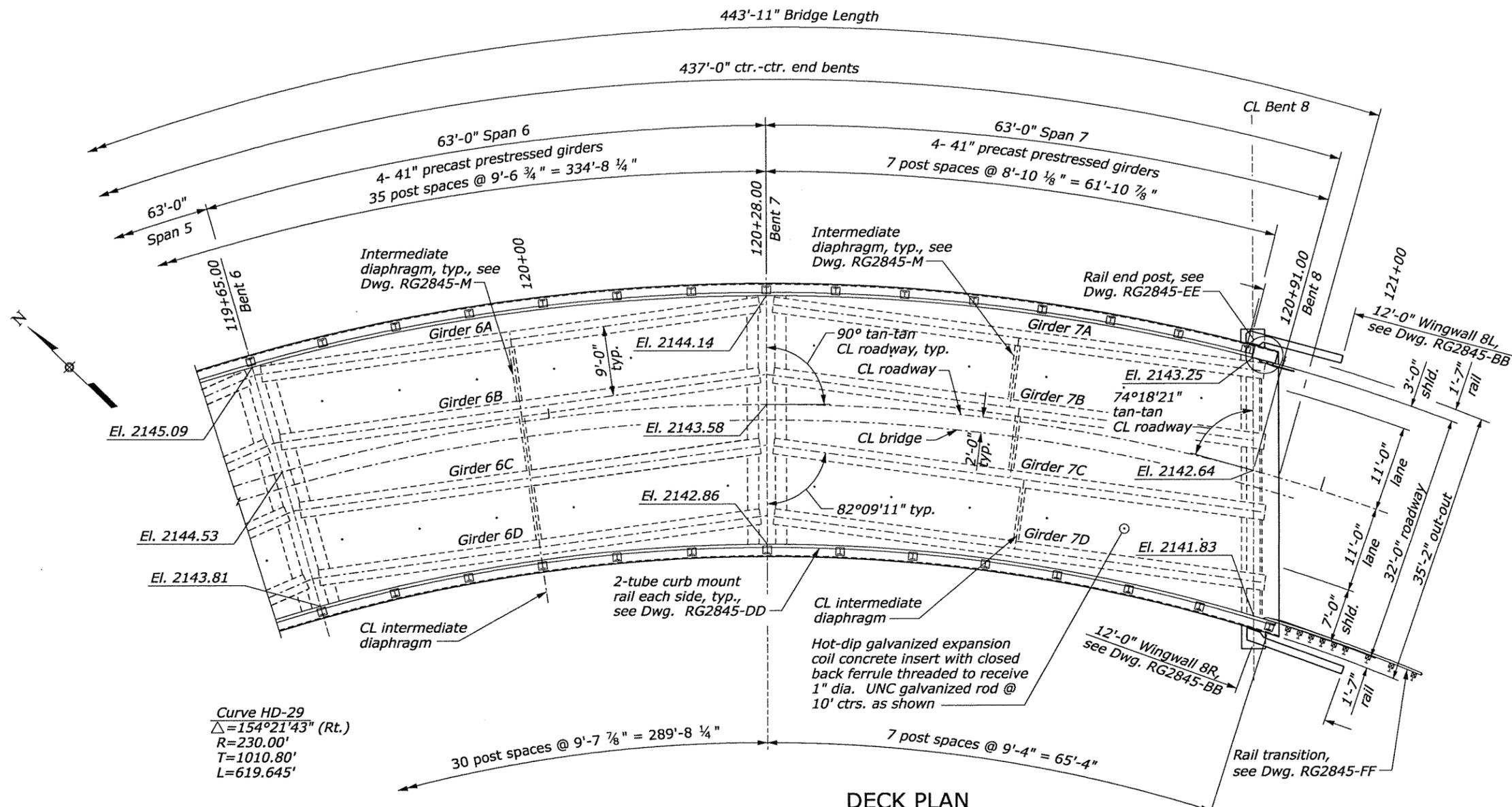
**WARNING:**  
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**DECK PLAN - SPANS 3, 4 & 5**

15-Aug-2007 01:27 PM ...1551012\_05 DECK SPAN 3 4 5.dgn

NO.	DATE	BY	REVISIONS	NO.	DATE	BY	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	PROJECT TEAM LEADER	BRIDGE DRAWING	DATE	DRAWING NO.
								ERIC E. BONN, P.E.	HEIDI SKEEN	PGS/NPR		G. GIFFORD	5 of 46	JUNE 2007	RG28045-E



Curve HD-29  
 $\Delta = 154^\circ 21' 43''$  (Rt.)  
 $R = 230.00'$   
 $T = 1010.80'$   
 $L = 619.645'$

**Notes:**  
 Elevations shown are finish grade top of concrete at center line of bent at gutter line and at roadway center line.  
 See Dwg. RG2845-G through L for deck reinforcement.

**DECK PLAN**  
 $\frac{1}{16}'' = 1'-0''$

**PRELIMINARY**

**WARNING:**  
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



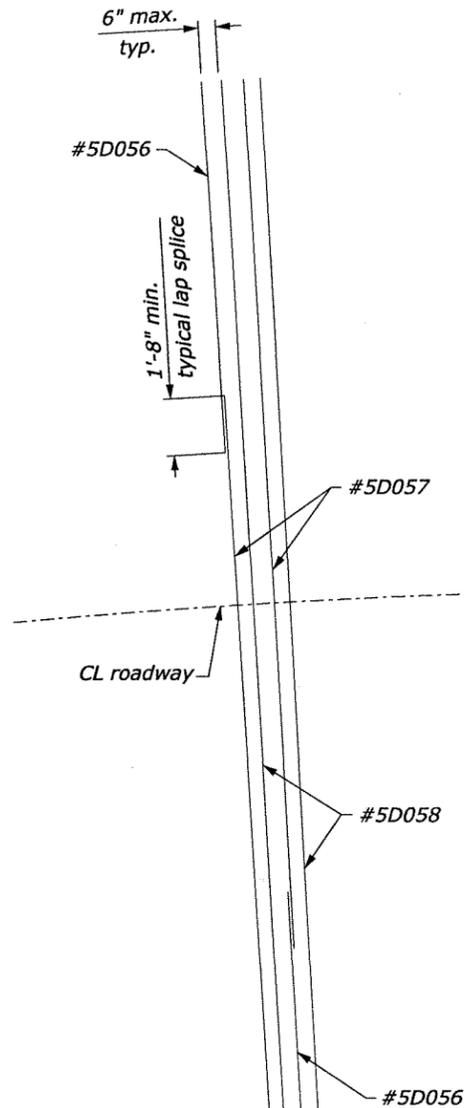
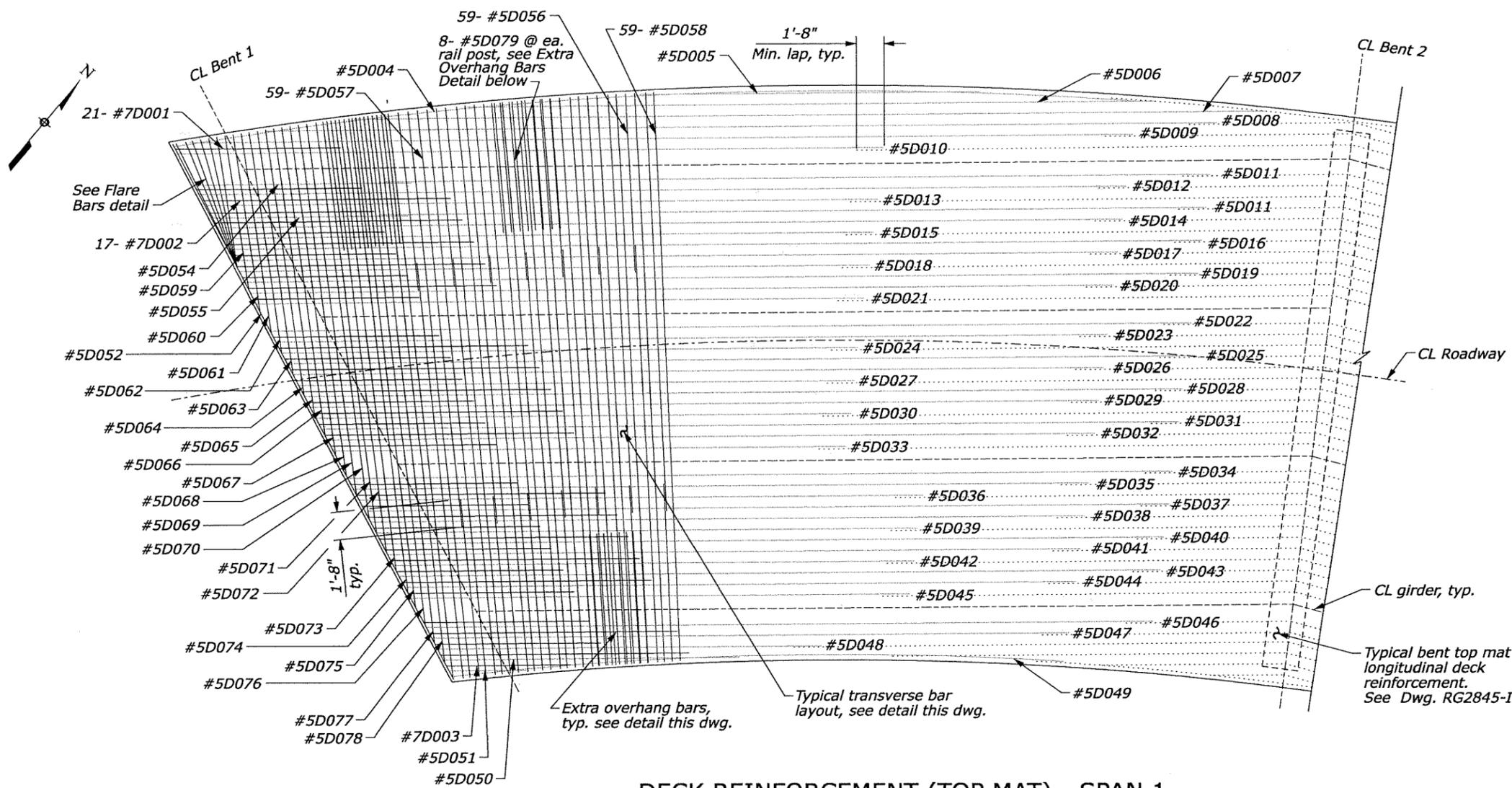
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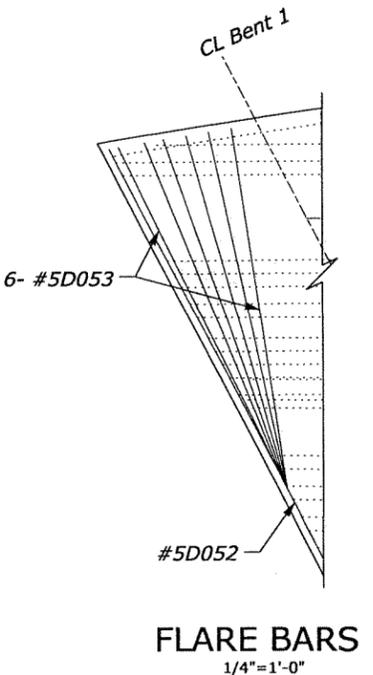
**DECK PLAN - SPANS 6 & 7**

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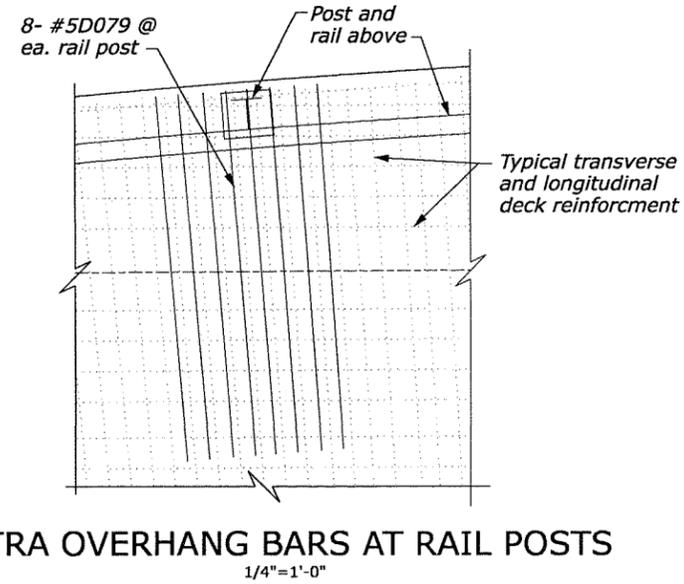
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								ERIC E. BONN, P.E.	HEIDI SKEEN	PGS/NPR		G. GIFFORD	6 of 46	JUNE 2007	RG2845-F



**DECK REINFORCEMENT (TOP MAT) - SPAN 1**  
1/8"=1'-0"



**FLARE BARS**  
1/4"=1'-0"



**EXTRA OVERHANG BARS AT RAIL POSTS**  
1/4"=1'-0"

**PRELIMINARY**

**TYPICAL TRANSVERSE BAR LAYOUT (BARS RADIAL)**  
NO SCALE

**WARNING:**  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



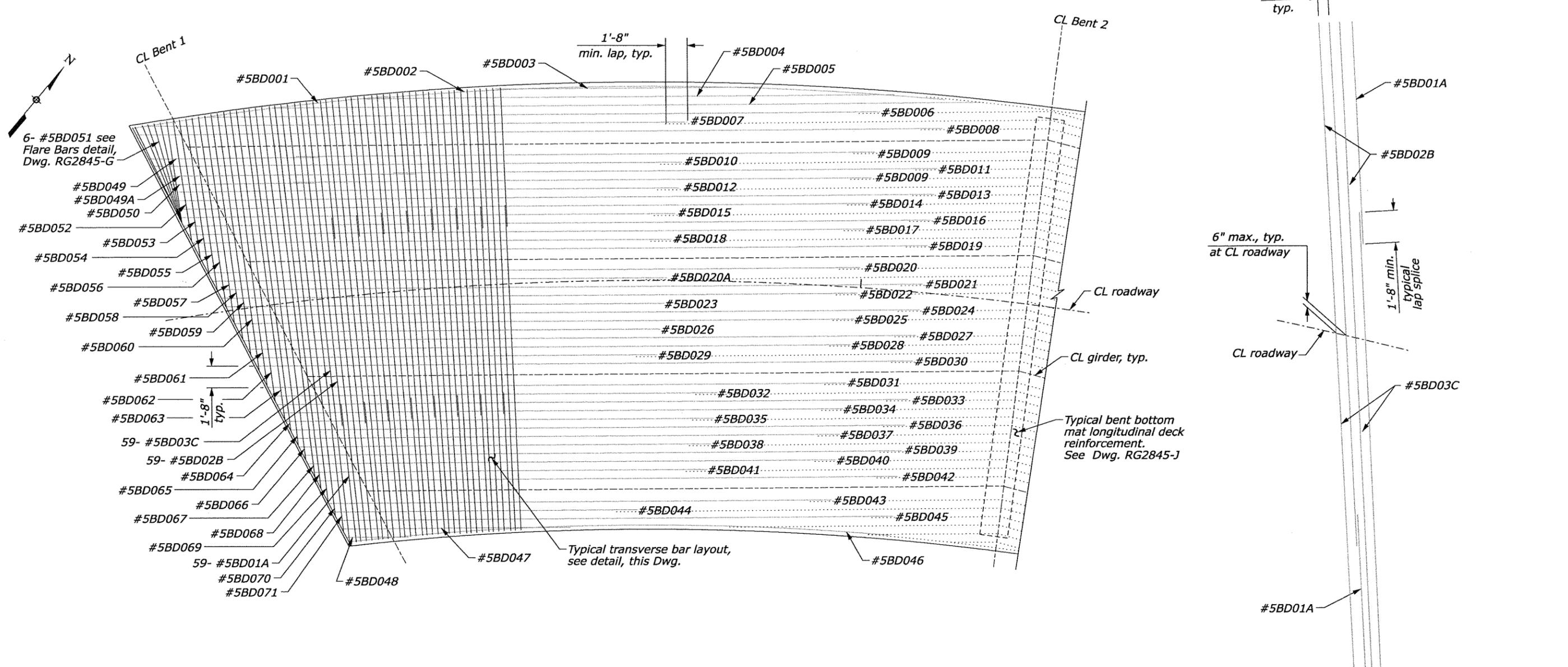
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**TOP DECK STEEL - SPAN 1**

15-Aug-2007 01:28 PM ...151012\_07 Top Deck Steel - Span 1.dgn

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								ERIC E. BONN, P.E.	R. GUERRERO	PGS/NPR	AS NOTED	G. GIFFORD	7 of 46	JUNE 2007	RG2845-G

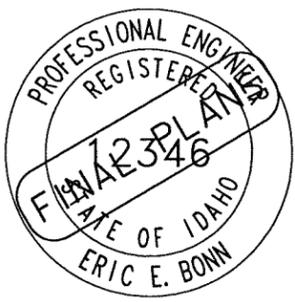


DECK REINFORCEMENT (BOTTOM MAT) - SPAN 1  
1/8"=1'-0"

**PRELIMINARY**

TYPICAL TRANSVERSE BAR LAYOUT (BARS RADIAL)  
NO SCALE

WARNING:  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



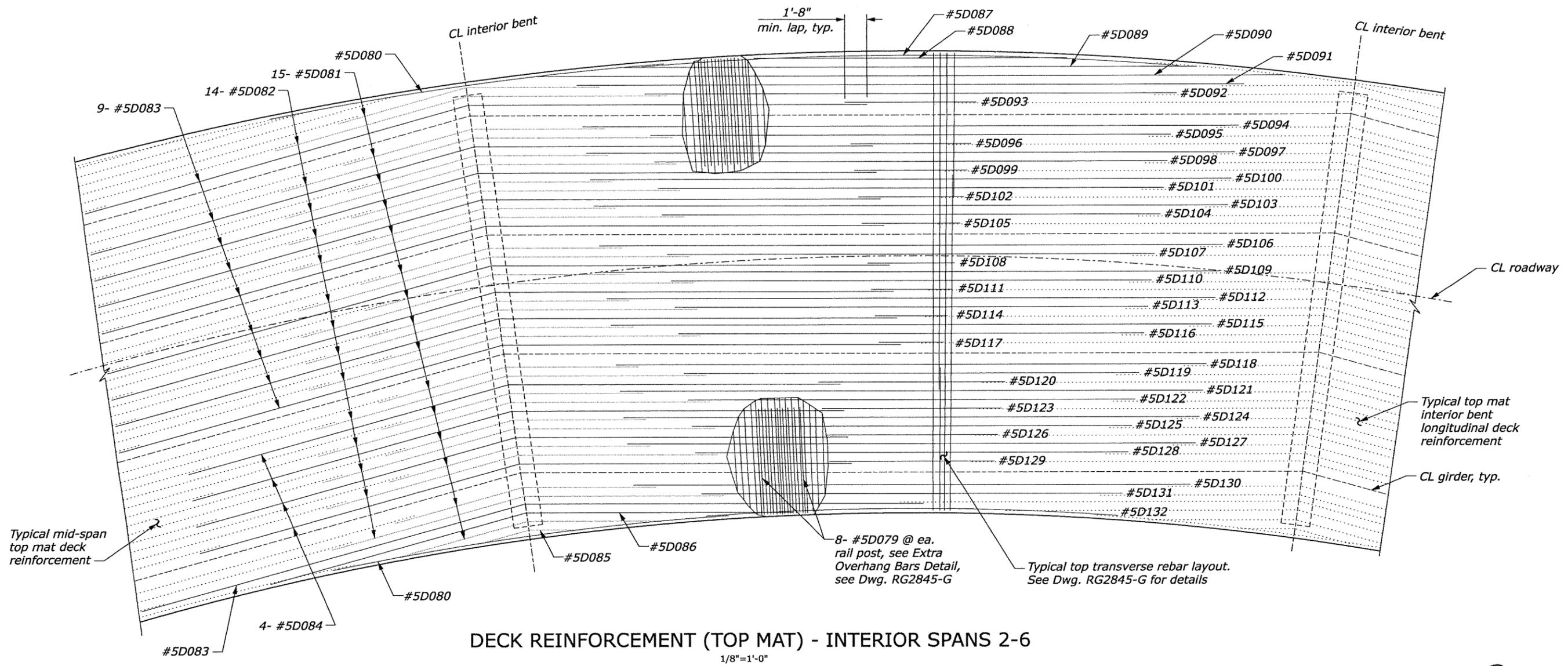
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**BOTTOM DECK STEEL - SPAN 1**

15-Aug-2007 01:28 PM ...:\951012\_08 Btm Deck Steel - Span 1.dgn

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								ERIC E. BONN, P.E.	R. GUERRERO		AS NOTED	G. GIFFORD	8 of 46	JUNE 2007	RG2845-H



DECK REINFORCEMENT (TOP MAT) - INTERIOR SPANS 2-6  
1/8"=1'-0"

**Note:**  
Bars #5D080-#5D086 are typical top mat bent longitudinal deck reinforcement at all interior bents.

**PRELIMINARY**

WARNING:  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



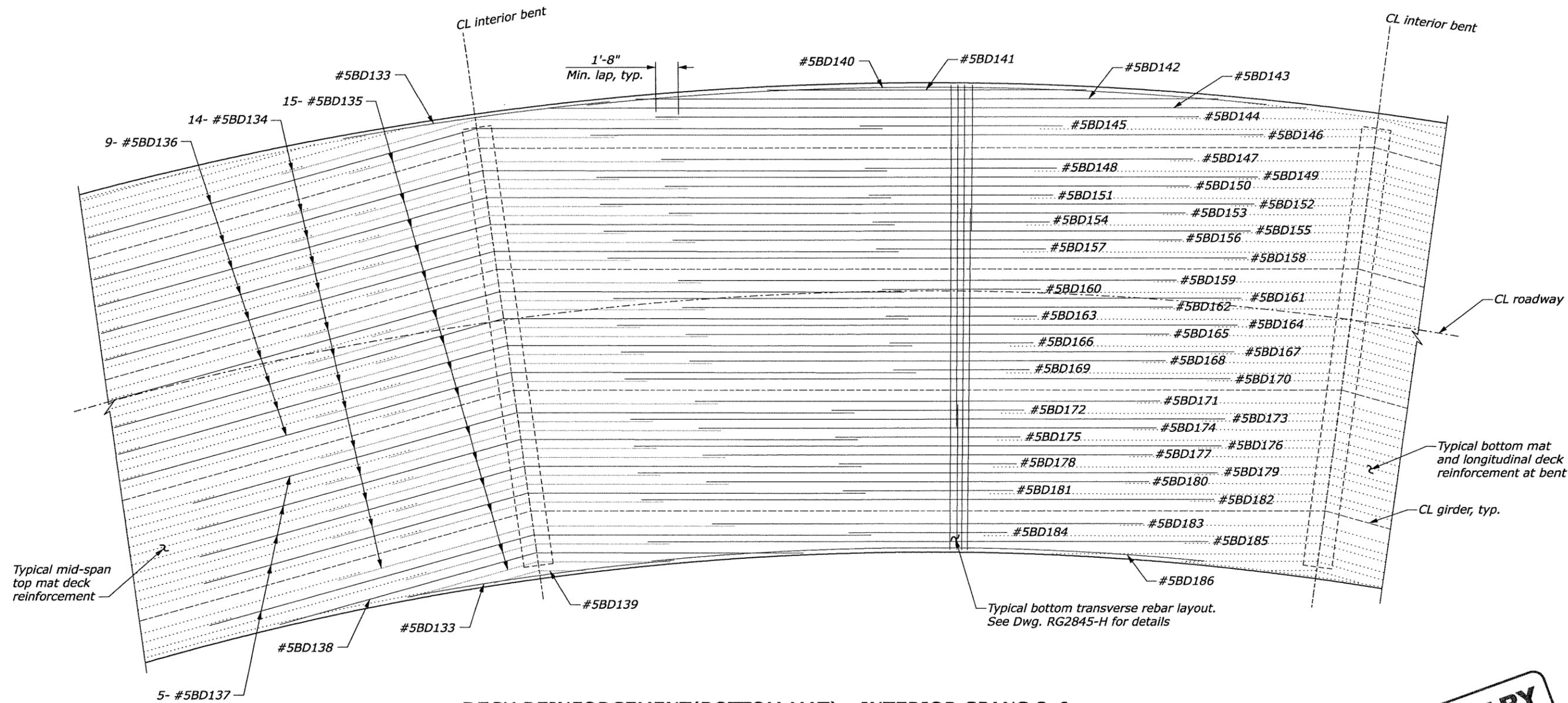
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**TOP DECK STEEL - INTERIOR SPANS**

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...1551012\_09 Top Deck Steel - Interior Spans.dgn

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								ERIC E. BONN, P.E.	R. GUERRERO	PGS/NPR	AS NOTED	G. GIFFORD	9 of 46	JUNE 2007	RG2845-I



DECK REINFORCEMENT(BOTTOM MAT) - INTERIOR SPANS 2-6

1/8"=1'-0"

**PRELIMINARY**

**Note:**  
Bars #5BD133-#5BD139 are typical bottom mat bent longitudinal deck reinforcement at all interior bents.



WARNING:  
IF THIS BAR DOES NOT MEASURE 1"  
THEN DRAWING IS NOT TO SCALE.



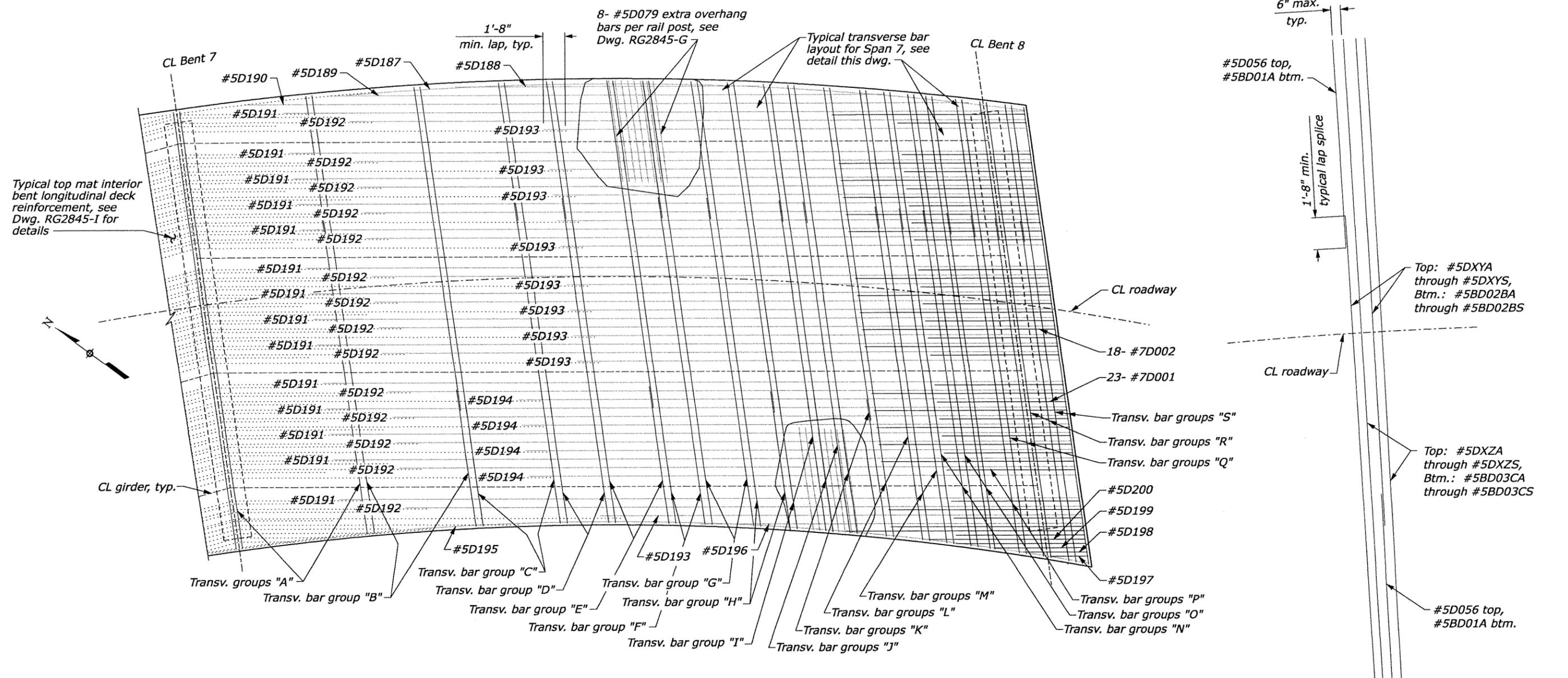
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**BTM. DECK STEEL - INTERIOR SPANS**

15-Aug-2007 01:29 PM ...1551012\_10 Btm Deck Steel - Interior Spans.dgn

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								ERIC E. BONN, P.E	R. GUERRERO		AS NOTED	G. GIFFORD	10 of 46	JUNE 2007	RG2845-J



DECK REINFORCEMENT (TOP MAT) - SPAN 7  
1/8"=1'-0"

TYPICAL TRANSVERSE BAR LAYOUT (BARS PARALLEL TO BENTS)  
NO SCALE

**PRELIMINARY**

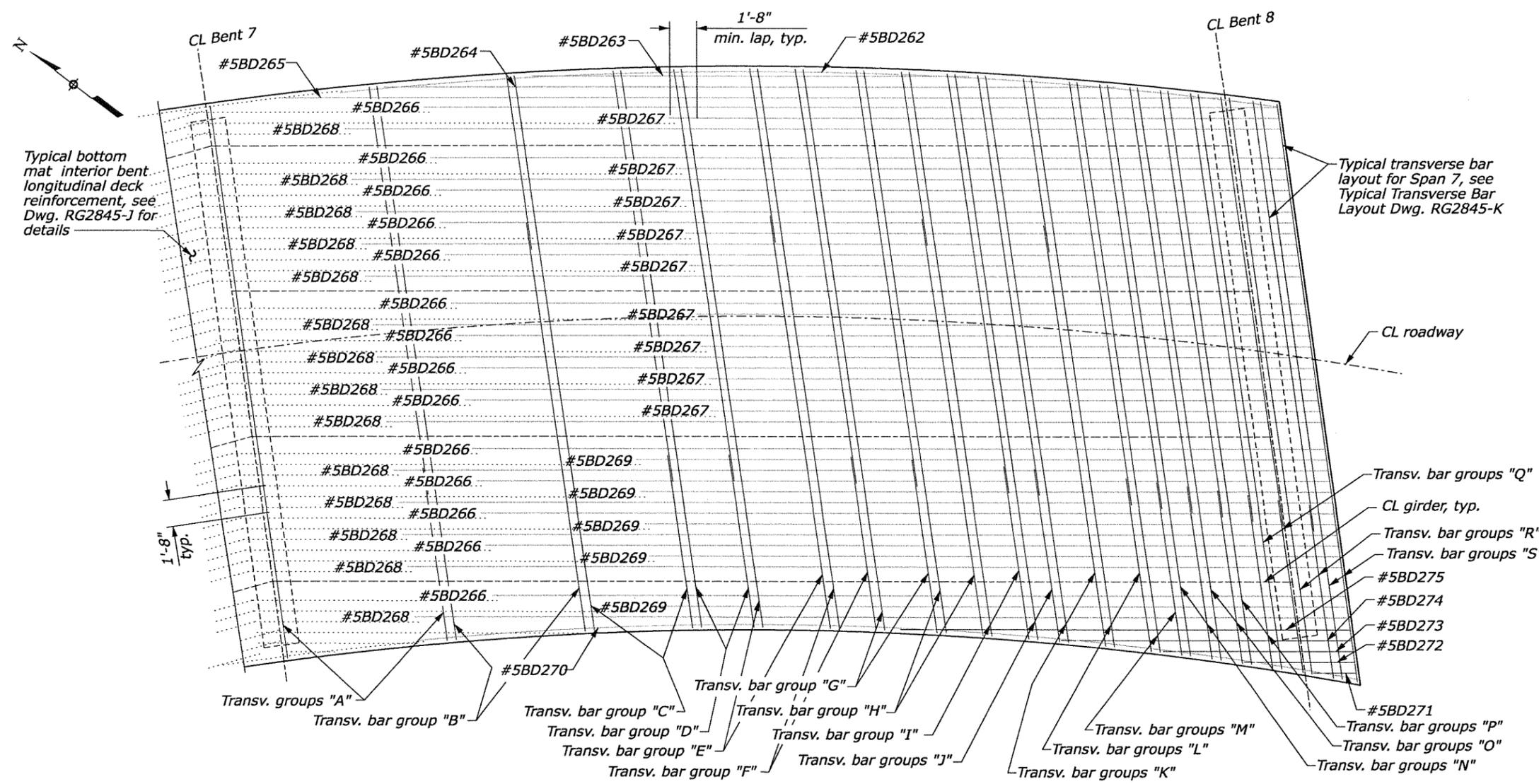
WARNING:  
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**TOP DECK STEEL - SPAN 7**

15-Aug-2007 01:29 PM  
...1551012\_11 Top Deck Steel - Span 7.dgn

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								ERIC E. BONN, P.E.	R.F. GIFFORD/DIS	PGS/NPR	AS NOTED	G. GIFFORD	11 of 46	JUNE 2007	RG2845-K



DECK REINFORCEMENT (BOTTOM MAT) - SPAN 7  
1/8"=1'-0"

**PRELIMINARY**



WARNING:  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



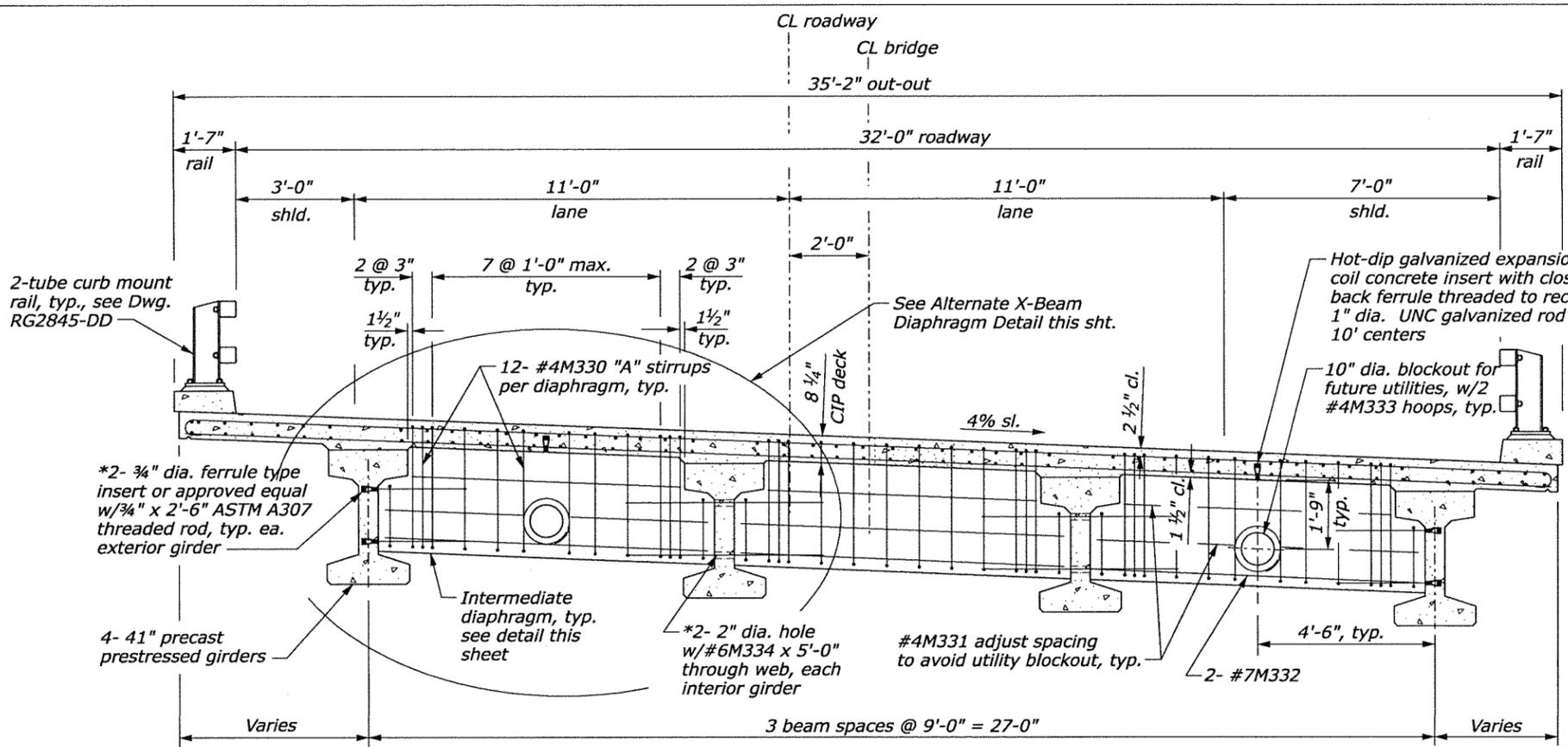
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**BOTTOM DECK STEEL - SPAN 7**

15-Aug-2007 01:29 PM ...1551012\_12 Btm Deck Steel - Span 7.dgn

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**TYPICAL DECK SECTION**  
1/4" = 1'-0"

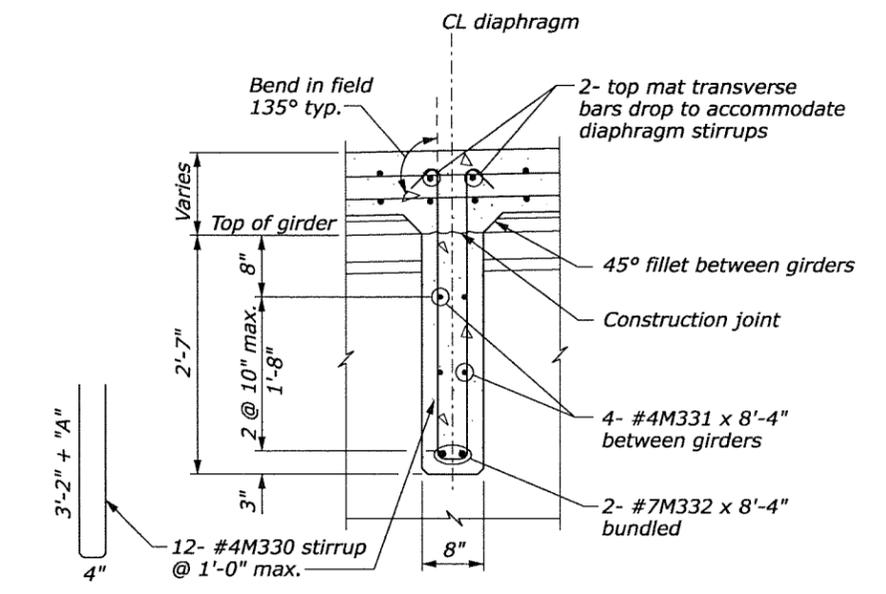
**Typical Deck Reinforcement:**  
Place top mat directly above bottom mat in both directions.

**Longitudinal Reinforcement:**  
45- #5 bars @ 8" ctrs. top.  
39- #7 bars btwn. #5 bars at Bent 1.  
41- #7 bars btwn. #5 bars at Bent 8.  
45- #5 bars x cont. @ 8" ctrs. bottom.  
Place all longitudinal bars as shown, parallel to roadway centerline. See Dwg. RG2845-I for "Top Deck Steel-Interior Spans."

**Transverse Reinforcement:**  
#5 bars @ 6" max. ctrs. top & bottom.  
Hook top bars w/std. 180° hook each end.  
Additional 8- #5 @ 6" w/std. 180° hook one end, top mat, at each rail post alternate w/typical transverse bars.  
Place all transverse bars in Span 1 as shown, see Dwg. RG2845-G and RG2845-H.  
Place all transverse bars in Span 2-6 radially, see Dwg. RG2845-I and RG2845-J.

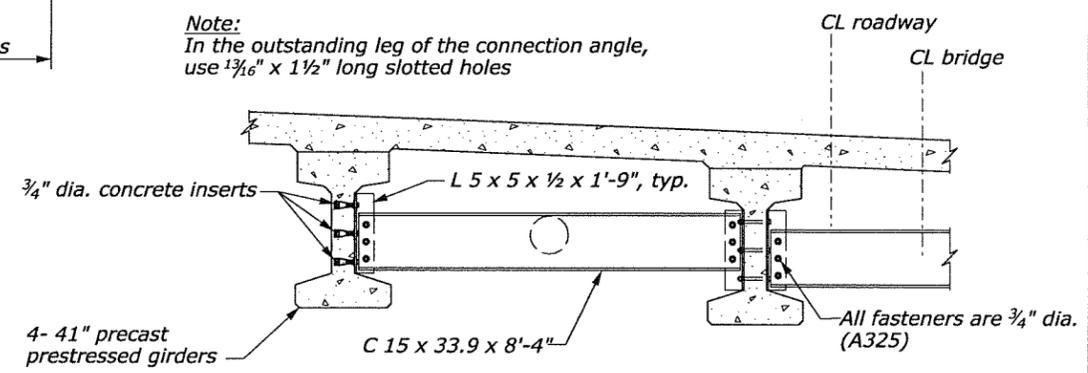
\*Omit holes and place inserts on the interior face of exterior girders and at staggered diaphragms. Place holes and inserts perpendicular to skew. Inserts shall be 3/4" Burke hi-tensile, Lancaster malleable, Dayton-Superior F-62 flared thin slab (3/4" x 4 5/8") ferrule insert or approved equal, typ.

**PRELIMINARY**

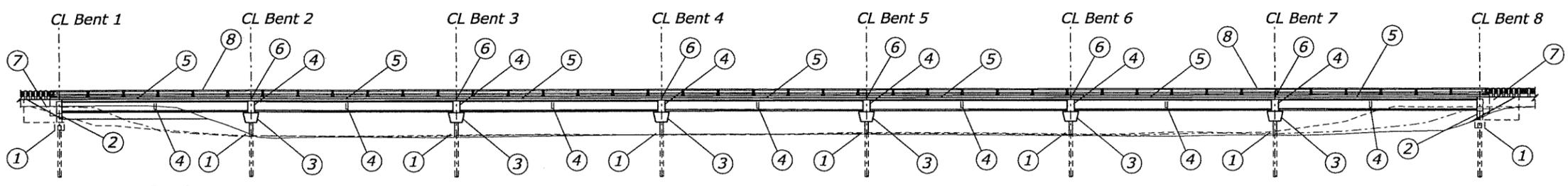


**TYPICAL INTERMEDIATE SPAN DIAPHRAGM SECTION**  
1/2" = 1'-0"

**Note:**  
In the outstanding leg of the connection angle, use 1 3/8" x 1 1/2" long slotted holes



**ALTERNATE X-BEAM DIAPHRAGM DETAIL**  
1/4" = 1'-0"



- Pour Schedule:**
- ① Bent 1 pile cap, Bents 2-7 concrete pile infill and Bent 8 pile cap.
  - ② Bents 1 & 8 pedestals.
  - ③ Bents 2-7 crossbeams.
  - ④ Bents 2-7 end beams. Spans 1-7 diaphragms.
  - ⑤ Spans 1-7 deck.
  - ⑥ Bents 2-7 closure and deck.
  - ⑦ Bents 1 and 8 backwall and wingwalls (may occur after pour ④).
  - ⑧ Bridge rail curbs.

**POUR SCHEDULE DIAGRAM**  
1" = 40'

**WARNING:**  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



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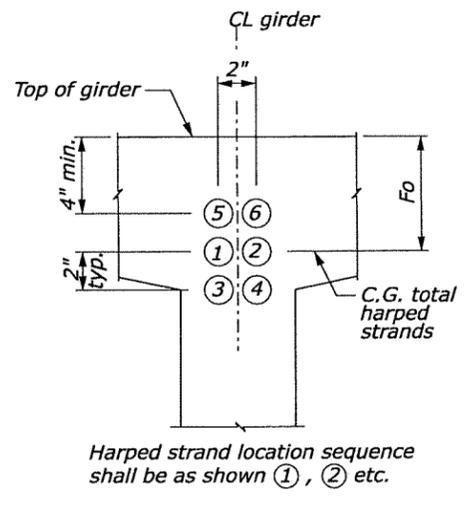
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**TYPICAL DECK SECTION**

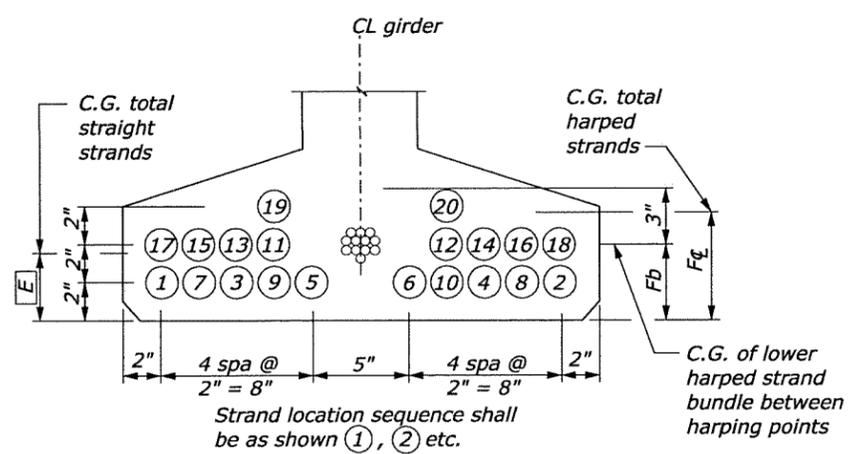
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...19510.12.13 TYPICAL DECK SECTION.dgn

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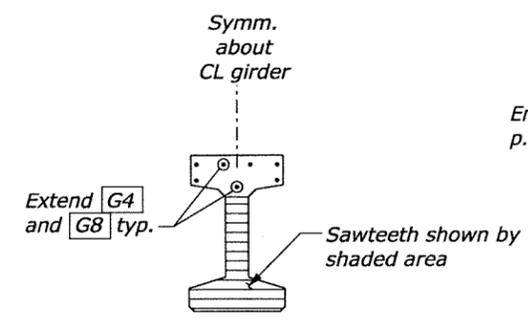




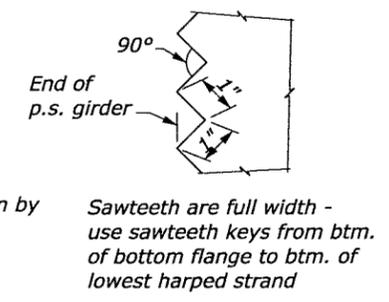
**STRAND PATTERN AT GIRDER END**  
NO SCALE



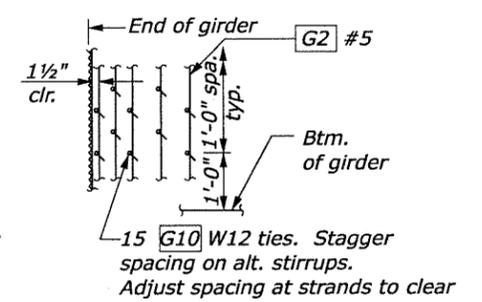
**STRAND PATTERN AT CL SPAN**  
NO SCALE



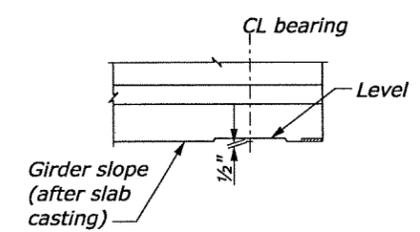
**GIRDER END**  
1/4"=1'-0"



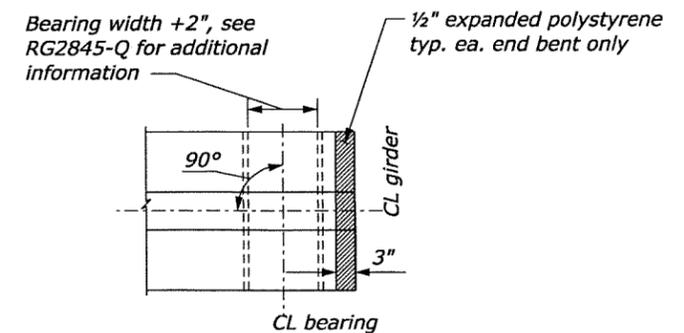
**SAWTEETH DETAILS**  
NO SCALE



**TIE SPACING DETAIL**  
NO SCALE



**ELEVATION**  
NO SCALE



**PLAN-BEARING RECESS & BOTTOM FLANGE SPALL PROTECTION @ END BENTS ONLY**  
NO SCALE

Span	Girder	End 1	End 2	S (in.)	LS (ft.)	01	02	P1	P2	Plan Length	Min. conc Compr. strength (ksi)		Harped		Straight		Location of C.G. strands (in)				Camber/shortening (in)		
											@ final	@ release	No. of Strands	Jacking Force (kips)	No. of Strands	Jacking Force (kips)	E	F <sub>CL</sub>	F <sub>b</sub>	F <sub>o</sub>	Release Δ	90 day Δ	Shortening
											1	A	A	C	9	6	0°	0°	1'-11"	N/A	67'-11 1/8"	8.0	5.0
1	B	C	C	9	6	0°	0°	1'-11"	N/A	62'-1 1/2"	8.0	5.0	4	124	18	558	2.89	5.00	5.00	8.00	7/8	1 1/4	1/8
1	C	C	C	9	6	0°	0°	1'-11"	N/A	56'-3 7/8"	8.0	5.0	4	124	16	496	2.75	8.00	8.00	8.00	5/8	1	1/8
1	D*	C	C	9	6	0°	0°	1'-11"	N/A	50'-6 1/4"	8.0	5.0	4	124	16	496	2.75	9.00	9.00	8.00	5/8	3/4	1/8
2-6	A	C	C	9	6	0°	0°	N/A	N/A	64'-6 3/8"	8.0	5.0	6	186	20	620	3.20	5.00	5.00	8.00	1 1/8	1 5/8	1/4
2-6	B	C	C	9	6	0°	0°	N/A	N/A	62'-0 7/8"	8.0	5.0	4	124	18	558	2.89	8.00	8.00	8.00	7/8	1 3/8	1/8
2-6	C	C	C	9	6	0°	0°	N/A	N/A	59'-7 1/8"	8.0	5.0	4	124	18	558	2.89	8.00	8.00	8.00	7/8	1 1/4	1/8
2-6	D	C	C	9	6	0°	0°	N/A	N/A	57'-1 1/4"	8.0	5.0	4	124	18	558	2.89	8.00	8.00	8.00	7/8	1 1/4	1/8
7	A-D	C	A	9	6	0°	0°	N/A	1'-5 1/2"	63'-4 3/8"	8.0	5.0	4	124	18	558	2.89	5.00	5.00	8.00	7/8	1 3/8	1/8

\*Temporary strands may be required to control release stresses.

**PRELIMINARY**

WARNING:  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



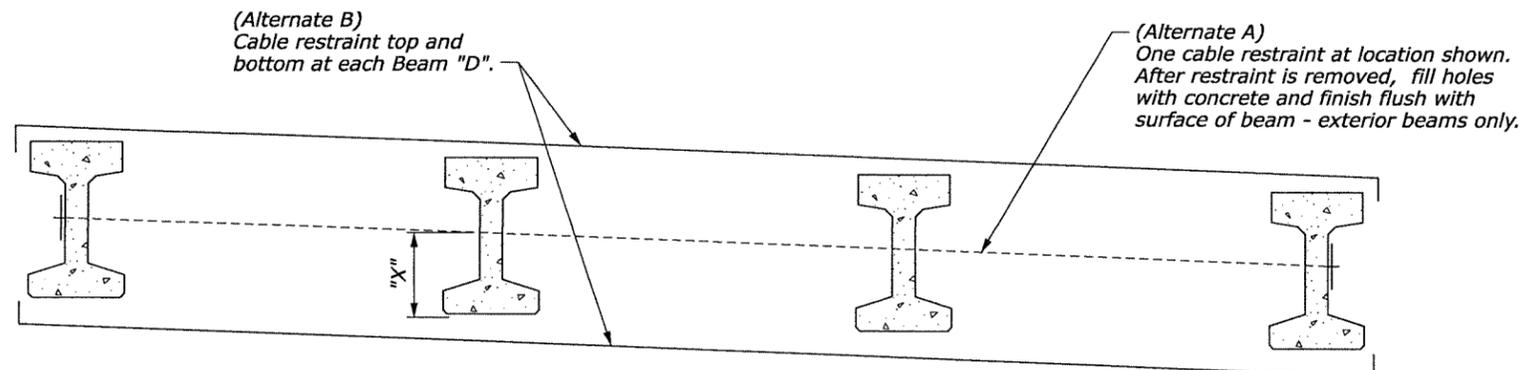
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**CONCRETE GIRDER DETAILS - 2**

15-Aug-2007 01:34 PM ...151012\_15 GIRDER DTLS 2.dgn

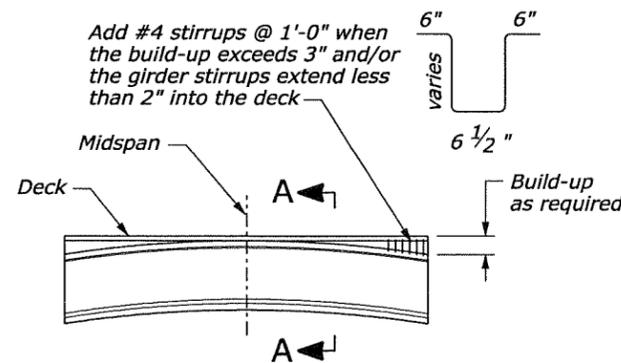
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**BEAM RESTRAINT DIAGRAM**

No Scale

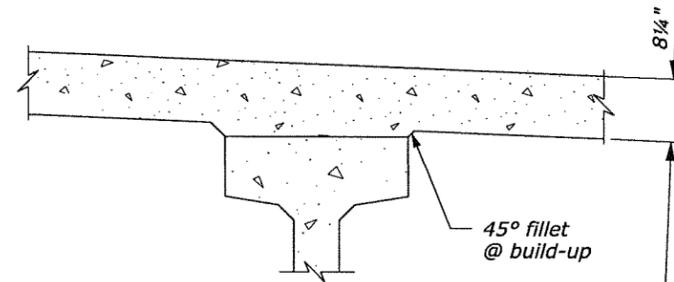
Snug fit prestressed beams against forms prior to diaphragm pour.  
Restraints to remain in place a minimum of two days after completion of diaphragm pour.



Beam soffits shall be on level grade prior to prestressing. Difference between deck elevation and camber in beams shall be compensated for by build-up over beams.

**BUILD-UP DECK DETAIL**

No Scale



Minimum deck thickness. This dimension assumes that the beam fabrication and erection will meet the required deck elevations. In case of variations, lower beam to meet corrected elevation

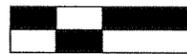
**SECTION A-A**

No Scale

Note:  
For Bulb-I Girder general details, see Dwgs. RG2845-N, RG2845-O.

**PRELIMINARY**

**WARNING:**  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



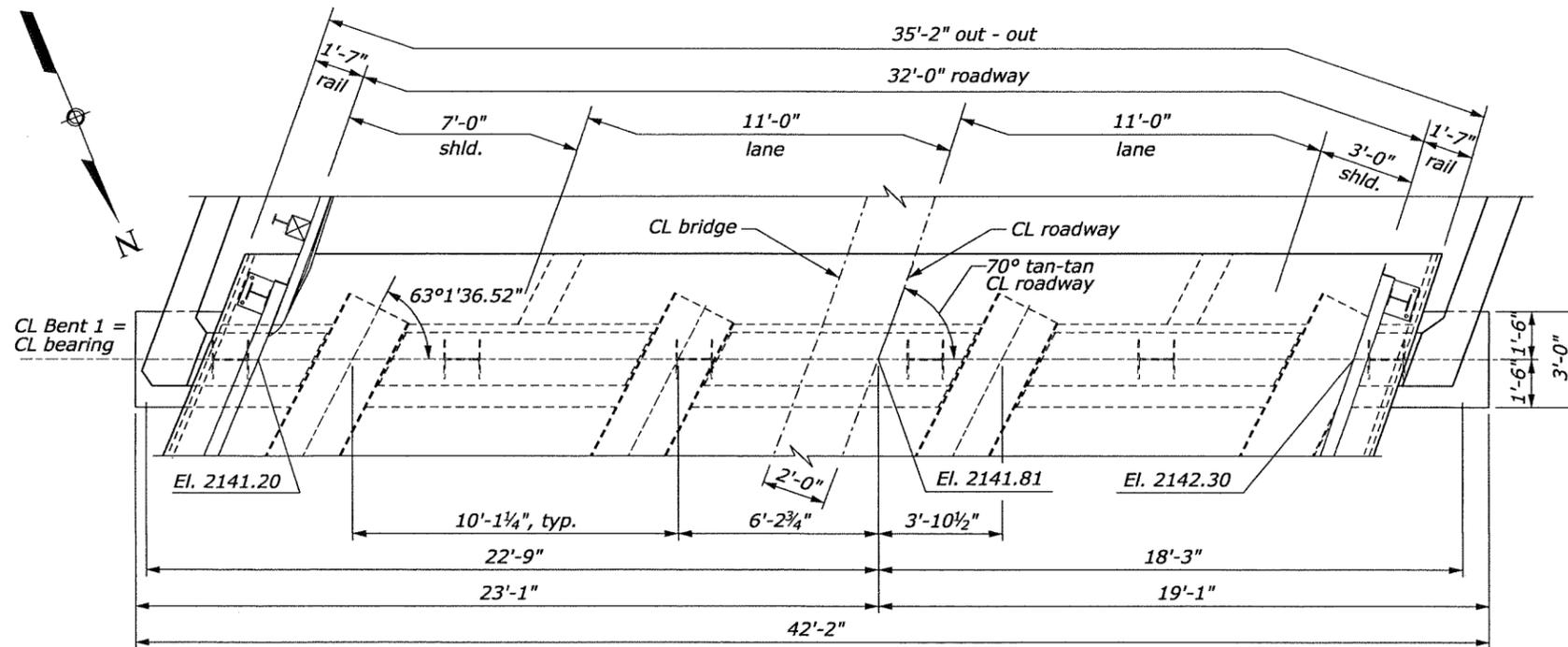
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**BUILD-UP DECK & BEAM RESTRAINT**

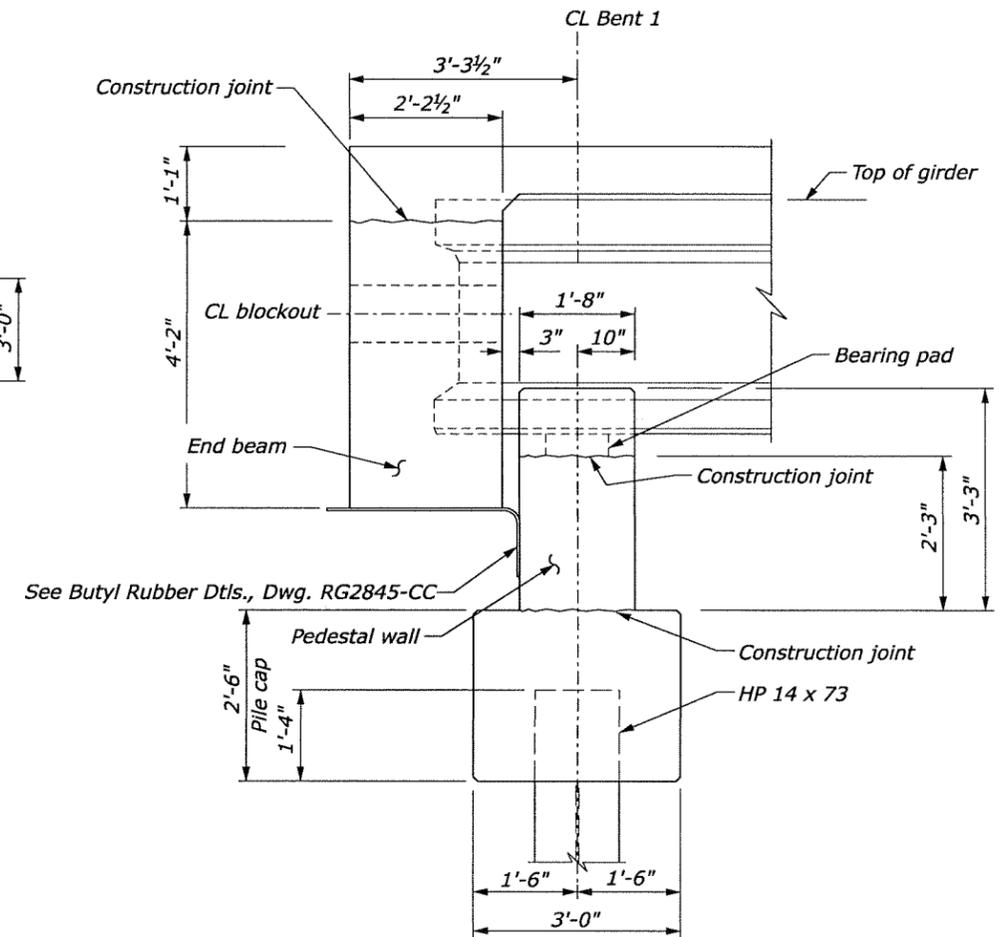
15-Aug-2007 01:35 PM ...155101.2\_16 BUILD-UP DECK & BEAM RESTRAINT.dgn

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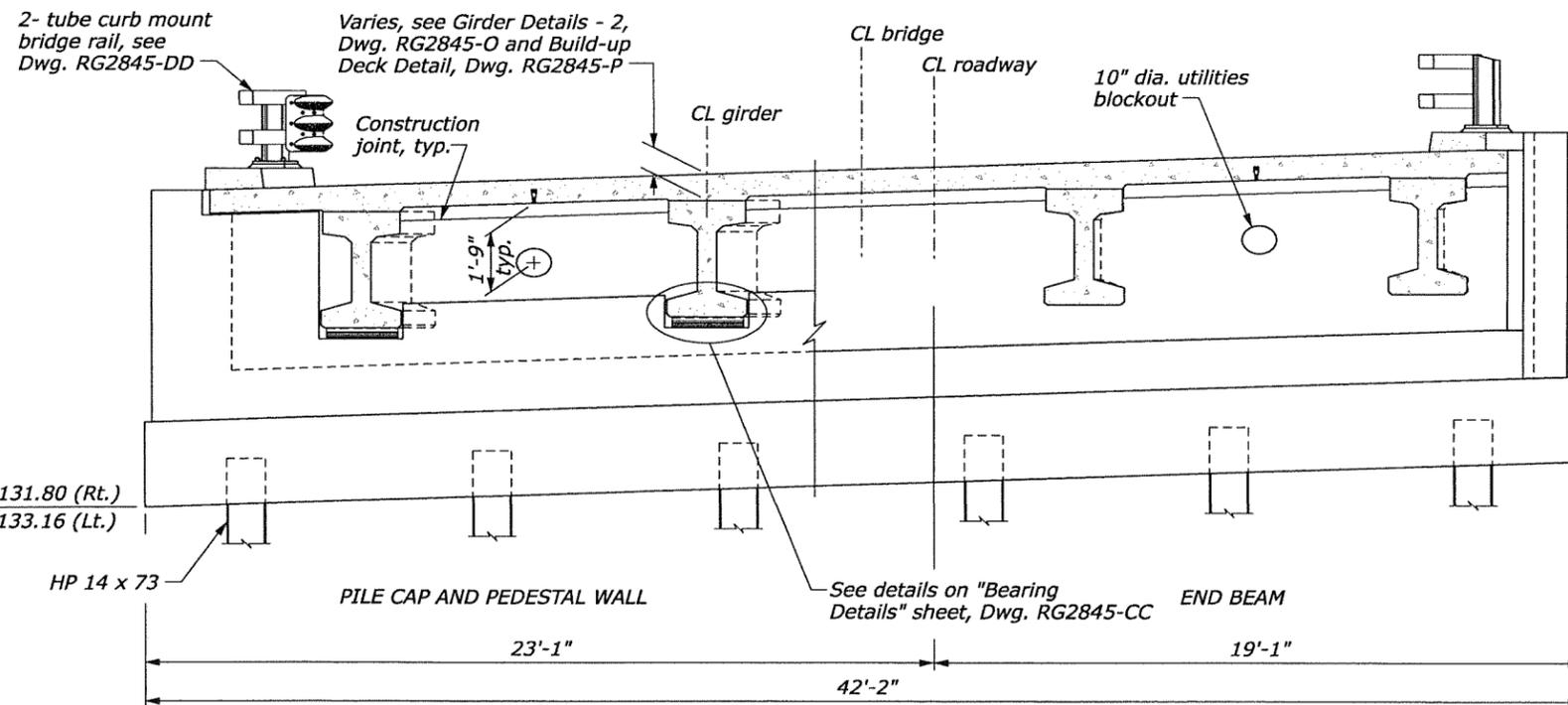
**Note:**  
Elevations shown are finish grade top of concrete at center line of bent at gutter line and at roadway center line.

**PLAN - BENT 1**  
3/16" = 1'-0"



**TYPICAL BENT SECTION**  
3/8" = 1'-0"

**PRELIMINARY**



**ELEVATION - BENT 1 (LOOKING BACK ON STATION)**  
3/16" = 1'-0"

**Note:**  
For pile spacing, see Foundation Plan Dwg. RG2845-C.  
For end beam reinforcement, see Dwg. RG2845-R.  
For pedestal wall reinforcement, see Dwg. RG2845-S.  
For pile cap reinforcement, see Dwg. RG2845-T.

**WARNING:**  
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**BENT 1 DETAILS**

15-Aug-2007 01:35 PM  
...1551012\_17 BENT 1 DETAILS 1.dgn

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