Allied Engineering
&Testing, Inc.

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March 12, 2007

Mr. Roger Simmons, P.E.
HDR Engineering, Inc.
25 West Cedar Street, Suite 200
Pensacola, Florida 32502
850-429-8916

SUBJECT: Geotechnical Engineering Services Report
Big Cypress Visitor Center
Collier County, Florida
Allied Project No. 47-6427

Dear Mr. Simmons:

Allied Engineering & Testing, Inc. is pleased to submit our geotechnical engineering services report for the above reference project. The scope of our services was outlined in the subconsultant agreement, dated January 5, 2007. The following report presents the project information made available to us, our observation of the existing site conditions, the subsurface geotechnical information obtained during this exploration, our geotechnical evaluation of the site and our recommendations and soil suitability and site preparation. Also included with this report are the results of our field and laboratory testing. The assessment of site environmental conditions for the presence of pollutants in the soil, rock and groundwater at this site was not included as a part of our services.

We appreciate the opportunity to provide these services to you. If you have any questions regarding this report or if we may be of further service to you, please do not hesitate to call.

Sincerely,

ALLIED ENGINEERING & TESTING, INC.

Christopher Mackay
Staff Engineer

Paul J. D'huyvetter, P.E.
Florida Registration No. 59716

Copies Submitted: (3) Addressee

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INTRODUCTION

HDR Engineering, Inc. retained Allied Engineering & Testing, Inc. (Allied) to perform a geotechnical engineering study for the Big Cypress Visitor Center project located in Collier County, Florida. Refer to Figure 1 for a site vicinity map. The purpose of this study is to evaluate subsurface soil and groundwater conditions on the site, suitability of the soils encountered in the proposed retention pond location for use as a construction fill material and provide soil survey with respect to the proposed roadway alignment. The results of our subsurface exploration of soils and groundwater conditions are presented herein along with geotechnical engineering evaluations of the tested site.

SITE CONDITIONS

A site reconnaissance was conducted by members of our engineering staff prior to mobilization of drilling equipment and crews. Additional site visits have been conducted as field work progressed. The purpose of the site visits was to observe the existing site conditions in order to detect any conditions that may impact our studies and recommendations.

The tested site is relatively level. No standing water was observed at our drilling locations during the time of our drilling. The site is partially landscaped.

SUBSURFACE EXPLORATION

The subsurface soil and groundwater conditions at the retention pond area were explored by drilling one (1) auger boring, designated with symbol AB-1, and drilled to a depth of about 10 feet below the existing grades.

The subsurface soil and groundwater conditions along the proposed roadway alignment were explored by drilling four one (1) auger boring, AB-2, and nine (9) hand auger borings, HA-1 through HA-9. The auger boring, AB-2, was drilled to a depth of about 10 feet, and hand auger borings HA-1 through HA-9 were drilled to a depth of about 5 feet below the existing grades.

The auger borings were advanced with a 4-inch diameter continuous flight auger. The borings were advanced by slowly twisting the auger into the soils. The auger is then pulled up vertically to expose the soil strata along the auger flights. Samples were then removed and classified by an engineering technician. The field log was prepared by the technician. Representative samples of each soil stratum were returned to the laboratory for further classification by the geotechnical engineer and laboratory testing.

The hand auger borings were performed with a bucket-type auger. The auger consists of a metal cylinder (or bucket), connected to a set of extension rods. The bucket has a diameter of about 3 inches and is about 6.5 inches tall. It is open at the top and fitted with cutters at the base. The auger is rotated and pressed down into the soil by means of a T-handle on the upper road. The auger borings are advanced in about 6-inch increments. Samples are removed and classified by

the engineering technician. Representative samples of each soil type are placed into air-tight jars and returned to the laboratory for further classification and laboratory testing. The hand auger borings were terminated at depths of practical refusal. Typically, practical refusal occurred when the side walls of the boring would collapse due to the water and soil conditions, or when the hard limestone layer is encountered.

Allied has also performed asphalt coring on the edge of the road in order to determine thickness and density of the pavement. One asphalt core was cut at the location indicated on the soil boring locations plan (Figure 2).

Two (2) double ring infiltrometer tests were performed by Allied in June, 2004 at the proposed retention pond location to determine site percolation characteristics. The double ring infiltrometer tests were performed in general accordance with ASTM D-3385-94 *Standard Test Method for Infiltration Rate of Soils in the Field Using Double Ring Infiltrometer.* The test results are provided in Appendix A. The original test results were presented in our Geotechnical Engineering Services Report, dated June 10, 2004, submitted to GEC Architecture, Inc., Miami, Florida.

The boring quantities, depth, and locations were specified by HDR Engineering, Inc. personnel in consultation with Allied Engineering & Testing, Inc. The approximate soil boring locations are shown on the soil boring location plan (Figure 2).

The subsurface geotechnical conditions encountered at the test boring locations are presented on the Soil Profiles (Figures 3 and 4). The soil profiles represent our interpretation of the subsurface soil conditions encountered based on the drillers field logs, and visual examination of the soil samples obtained by a geotechnical engineer. The stratification lines representing the interface between various changes in soil conditions and types are approximate. The actual transition between strata may be gradual. Soil samples obtained during the field exploration program were returned to our laboratory for further classification and testing.

LABORATORY TESTS

The laboratory tests were conducted in general accordance with ASTM specifications. The laboratory test results are summarized on Table 1. The laboratory test data are presented in Appendix C. The ASTM method number for each test and the number of tests completed are presented in the following table.

TEST DESCRIPTION	NUMBER OF TESTS	ASTM TEST METHOD
Gradation Analysis	8	D-422
Percent Passing No. 200 Sieve	8	D-1140
Atterburg Limits Testing	3	D-4318
Soil Classification	33	D-2487 and D-2488

Gradation Tests

Eight (8) gradation tests and eight (8) percent passing the No. 200 sieve size tests were performed on the samples obtained during the field exploration program. Material passing the No. 200 sieve is considered "fines" and will be either silt or clay. The percent of material passing the No. 200 sieve for the tested samples range from 7.7 to 39.9 percent. The particle size distribution curves are presented in Appendix B.

Atterburg Limits Tests

Three (3) Atterburg Limits tests were performed on samples taken from the site. Two silty sand samples collected from stratum (5) at borings AB-2 and HA-3 have the Plasticity Index PI of about 4. One soil sample also collected from stratum (5), at boring HA-6, was found as non-plastic.

SUBSURFACE CONDITIONS

The subsurface soils encountered at the proposed retention pond location are classified according to the Unified Soil Classification System. The subsurface soils encountered along the proposed roadway alignment and classified according to the American Association of State Highway Officials (AASHTO) System.

The subsurface soils encountered at the proposed retention pond consist of slightly silty to silty, fine sands (strata 1 and 2) underlain with limestone deposit (stratum 3) and clean, fine sands (stratum 4). Strata 1 and 2 soils consist of various shades of brown, slightly silty to silty sands. Stratum 1 soils contain a trace to some gravel. These sands are encountered from the existing ground level to depth of about 5 feet. Below these sands, the soft, weathered limestone deposit (Stratum 3) was encountered to a depth of about 7 feet. This limestone is underlain with clean, fine sands (stratum 4). Stratum 4 sands extend to the depth drilled of about 10 feet below the existing grades.

The subsurface soils encountered along the proposed roadway alignment consist of light brown to brown and grayish brown, clean to slightly silty sands classified as A-3 group, silty sands classified as A-2-4 group, and dark brown, very silty sands with medium plasticity classified as A-4 group. The A-3 group soils are encountered at the ground surface in all of the hand auger borings, HA-1 through HA-9. In boring AB-2, these soils are underlain with silty to very silty sands, A-2-4 to A-4 group, at a depth of about 4 feet. In borings HA-3 and HA-4, they are underlain with A-2-4 and A-4 group, at a depth of about 2 feet below the existing grades. Also, they are underlain with this group in boring HA-5 at depths of about 4 to 5 feet.

HYDROLOGIC SOIL GROUPS AND WATER FEATURES

Groundwater was encountered from about 3 to 5 feet below the ground surface in all soil borings at the time of drilling. Fluctuations in the groundwater level may occur, due to rainfall patterns, seasonal temperature variations, and construction activities.

The seasonal high water table and hydrologic soil groups for the tested area are indicated in the following table, based on the soil survey of Collier County, Florida, published by the United States Department of Agriculture.

Soil Name	Hydrologic Group	Flooding		High Water table			Soil Boring
		Frequency	Months	Depth (ft)	Kind	Months	
Kesson Muck	D	Frequent	Jan-Dec	0-0.5	Apparent	Jan-Dec.	All Borings

Based on the soil survey at Collier County, the surface layer, typically, consists of black muck about 5 inches thick. The Kesson soil makes up 75 to 90 percent of the map unit. The dissimilar soils in this map unit are small areas of Basinger, Dania, and Peckish soils in landscape positions similar to those of Kesson soil. These soils make up about 10 to 25 percent of the unit.

The water table fluctuates with tidal action and seasonal rainfall. It is at or near the surface for long periods. This soil is frequently flooded. The permeability of this soil is rapid to moderately rapid.

ASPHALT CORE TEST RESULTS

The asphalt core consists of two lifts. The thicknesses and densities of the lifts are shown in the table below.

Asphalt Core Location	Sample Number	Lift	Lift Thickness	Density (pcf)
Sta. 21 + 30 On edge of pavement. Right Side	1A 1B	Top Lift Bottom Lift	7/8 1 3/4	129.6 130.6

GEOTECHNICAL EVALUATION

The geotechnical evaluations for the tested site are based on the subsurface soil and groundwater conditions encountered during this study, the project information made available, our site observations, laboratory test results, and our experience in the vicinity. The test data has been evaluated using established correlations between geotechnical parameters of the soils similar with those recorded at this site, laboratory test results, and the observed performance of similar soil types.

RETENTION POND AREA

As discussed above and it as shown on the soil profiles (Figure 3), the near surface soils encountered of the proposed retention pond area are classified as clean to silty sands and soft limestone deposit. The limestone is encountered in thin layers not more than 2 foot thick. Based on visual manual classification and laboratory test results, all these soils are suitable for use as a construction fill material. The soil sample collected from stratum 2 soils, boring AB-1, and tested in our laboratory contains 17.9 percent of fine passing No. 200 sieve. The silty sands may require moisture conditioning, prior to placement as a fill in order to be compacted to high densities. Also, they may be mixed with cleaner sands to improve the workability of the soils.

The shallow limestone deposit is weathered to silty sands, gravel, and shell fragments. This limestone stratum could be a satisfactory source of limerock stabilized based material. Further investigation is needed to determine the percentage of carbonates of calcium and magnesium in this limerock material and its precise location on the site.

Excavation side slopes will slough back to the natural angle of repose, below the water table. The natural angle of repose for the sands and sands with silt will be about 22° to 24°. Slope stabilization will be required if steeper slopes are needed. These soils are also prone to erosion, and side slopes above the proposed water elevation in the lake should be provided with erosion control, such as vegetation or geosynthetic materials. The determination of which erosion control fabric is appropriate should be made by a qualified engineer based on soil type, pond slope, costs, and aesthetic appearance.

Based on our field and laboratory test results, a confining layer containing a low permeability material, bounding one or more aquifers, was not encountered throughout the tested area.

ROADWAY ALIGNMENT

The near surface soils encountered in hand auger boring HA-1 through HA-9 drilled along the proposed roadway alignment are classified as A-3, A-2-4 and A-4 soils. The A-3, and A-2-4 soils are rated as excellent to good for general subgrade base on the AASHTO Classification of highway subgrade materials. The A-4 soils are classified as fair to poor. A-4 soils are encountered in limited area at a depth of about 2 feet below the existing grades. It is our professional opinion, these soils are also suitable for support of the embankment section of the proposed road. The top layer of the A-3 soils, encountered above, should be compacted to a minimum of 85 percent of the Modified Proctor Maximum Dry Density (ASTM-1557).

The concrete pavement sections of the proposed roadway alignment may be designed as a slab-on-grade on the compacted structural fill. The plates may be calculated assuming a modulus of subgrade reaction (k_s) of 300 pci for compacted structural fill. However, this value of modulus of subgrade reaction (k_s) is to be used as a representative guide and structural analysis of concrete plates should be verified using several design methods.

Organic soils were not found during our field studies. If encountered, these materials should be removed during the clearing, grubbing, and stripping phases of construction. These areas, if encountered, should be monitored closely during construction to ascertain that the organic soils have been removed and replaced with construction fill.

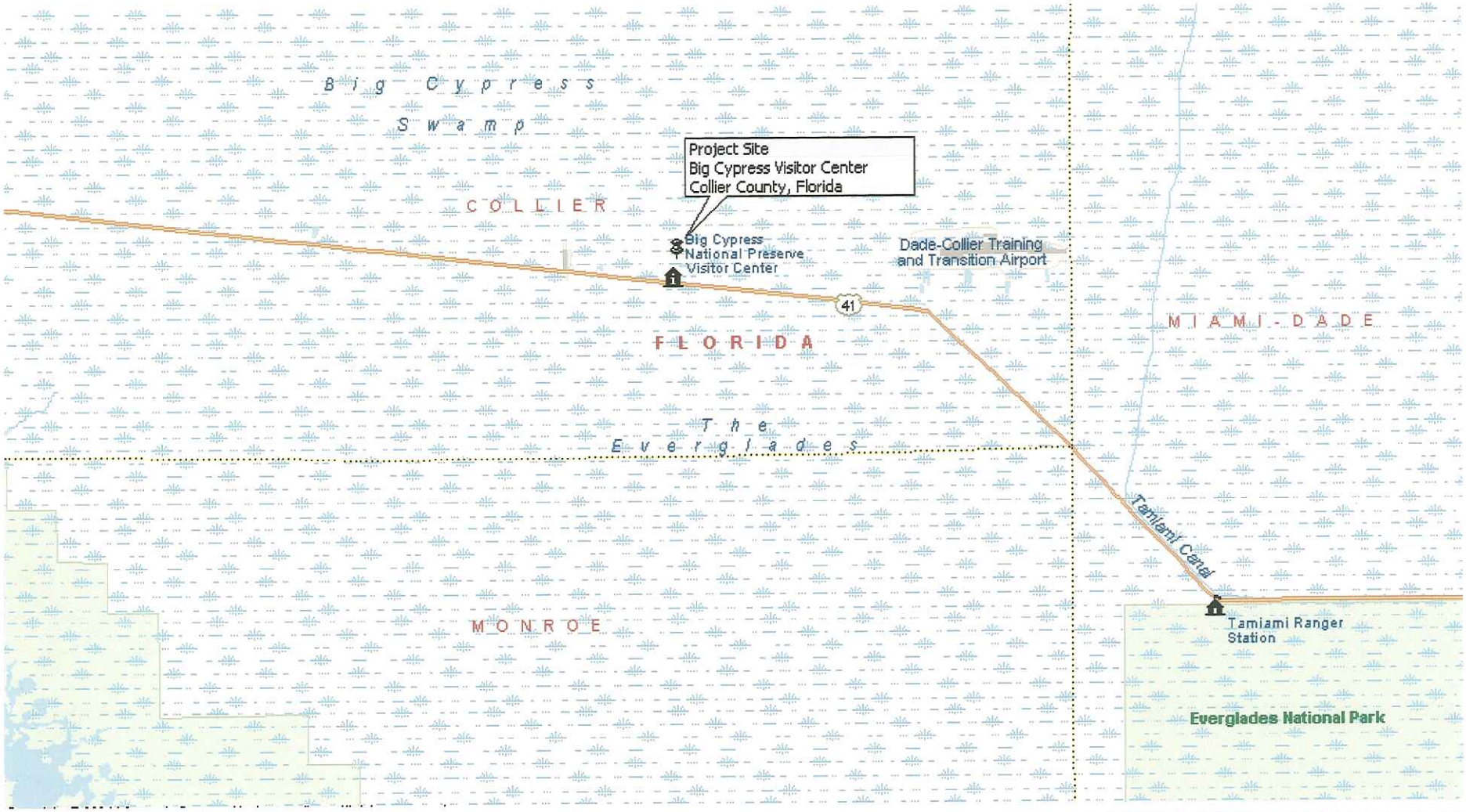
BASIS FOR EVALUATION AND RECOMMENDATIONS

The evaluation and recommendations presented in this report are based on the information provided and the soil conditions encountered at the specific boring locations. These recommendations apply only to the specific project and site. If there are any changes to the project information discussed in this report we should be contacted to review the changes and modify our recommendations, if necessary.

The construction procedures and geotechnical conditions encountered should be observed by experienced geotechnical personnel. This is necessary since the conditions encountered in the soil borings performed for this study could change between the borings and the conditions may not be the same as those anticipated by the designers or contractors. Additionally, the soils could be altered by the construction process. If changes in the soil conditions are encountered or if the procedures are not adequate, this information should be reported to the design team so that timely recommendations can be prepared to solve the problem. Based on Allied Engineering & Testings' familiarity with the project, the subsurface geotechnical conditions, and the intent of the recommendations, we recommend the owner retain our firm to provide the necessary site observations and testing.

We wish to remind you that our exploration services include storing collected samples and making them available for inspection for 60 days after our services are completed. The samples are then discarded unless you request otherwise.

FIGURE 1 - SITE VICINITY MAP



NOTES: MAP OBTAINED FROM MICROSOFT STREETS & TRIPS 2005

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Project: Big Cypress Visitor Center Collier County, Florida

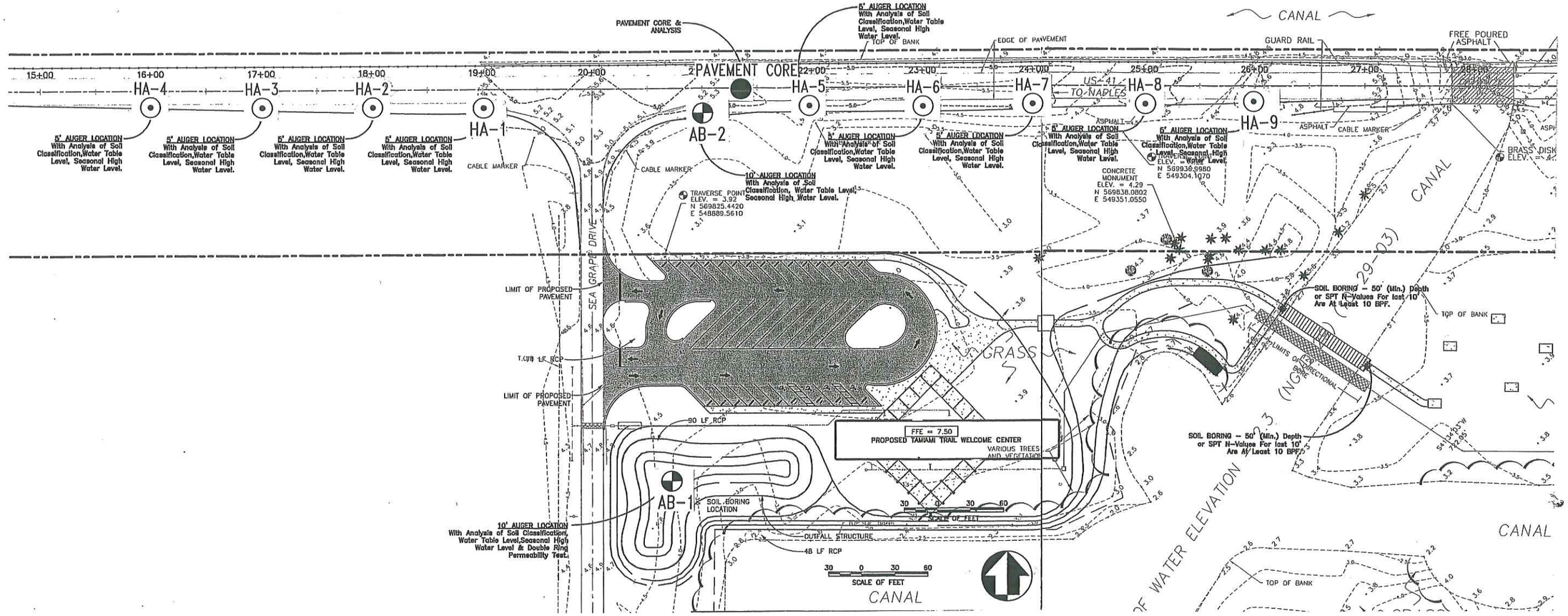
Approved By: Jeff D'huyvetter

Date: 3/7/07

Job No.: 47-6427

Drawn By: WPG

FIGURE 2 – BORING LOCATION PLAN



NOTES:
- AUGER BORING LOCATION
- HAND AUGER BORING LOCATION
- PAVEMENT CORE

BASE DRAWING PROVIDED BY HDR ENGINEERING, INC.

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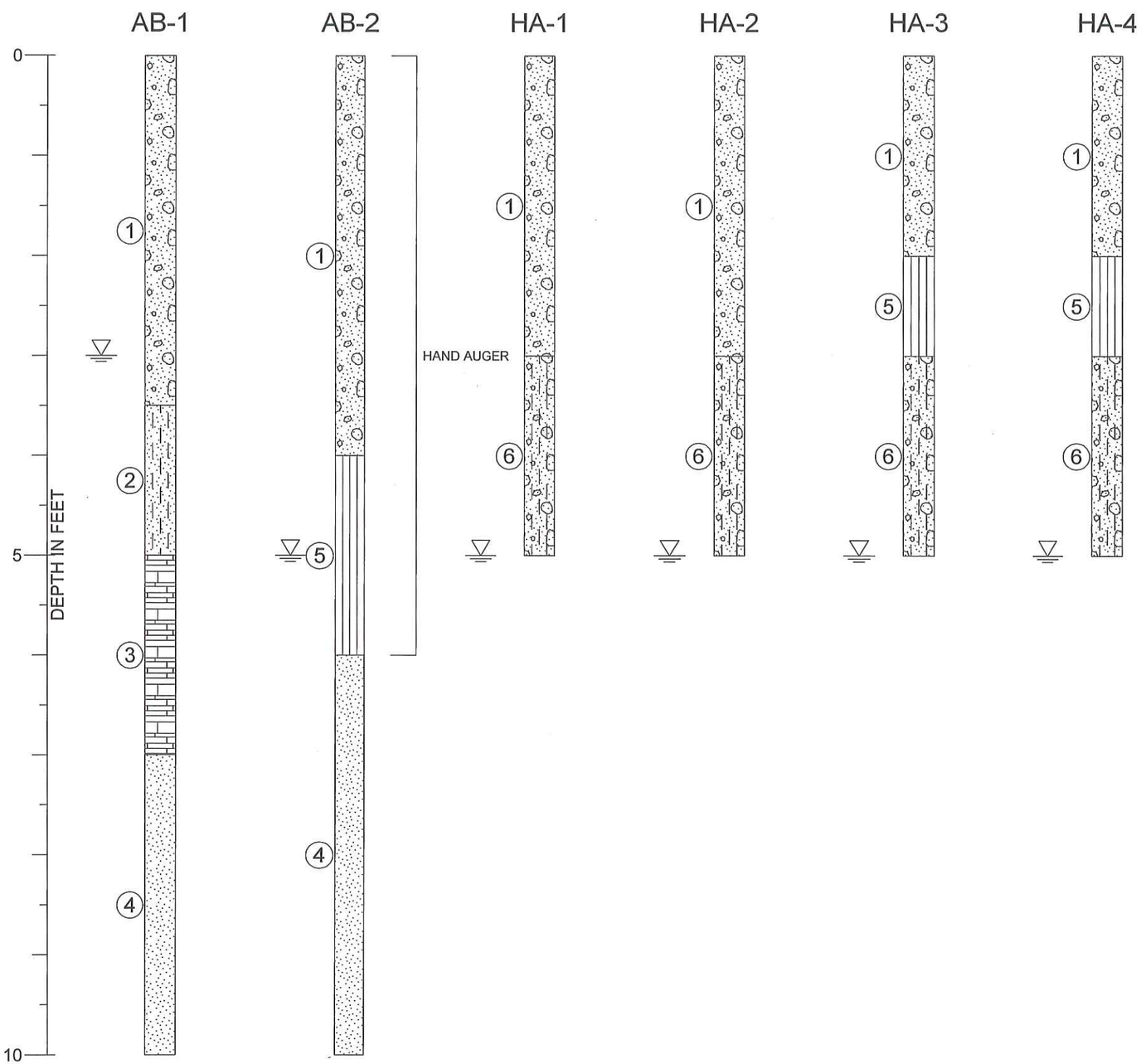
SOIL PROFILES



SOIL PROFILE LEGEND

B-X = BORING NUMBER

SOIL TYPE (X)

SOIL SYMBOLS

GROUND WATER LEVEL

INDICATES PRACTICAL REFUSAL TO BORING EQUIPMENT

= INDICATES GRADUAL TRANSITION IN SOIL TYPES

SOIL LEGEND

1. Light brown to grayish brown and brown to dark brown, slightly silty SAND, with a trace to some gravel, moist (SP-SM),(A-3)
2. Dark brown to grayish brown, silty SAND, wet (SM),(A-2-4)
3. Light gray LIMESTONE, weathered to gravel, silty sand and shell fragments, soft, wet (WLS)
4. Grayish brown, fine SAND, wet (SP),(A-3)
5. Dark brown, silty to very silty SAND, wet (SM),(A-2-4,A-4)
6. Dark brown to grayish brown, slightly silty to silty SAND, with a trace to some gravel and/or shell fragments, wet (SP-SM/SM),(A-3,A-2-4)

NOTES:

GPS COORDINATES OF BORINGS

AB-1 - 26 54.028" N 81 19.584" W
AB-2 - 25 54.081" N 81 19.576" W
HA-1 - 25 54.079" N 81 19.613" W
HA-2 - 25 54.079" N 81 19.631" W
HA-3 - 25 54.081" N 81 19.649" W
HA-4 - 25 54.081" N 81 19.666" W
HA-5 - 25 54.080" N 81 19.558" W
HA-6 - 25 54.082" N 81 19.539" W
HA-7 - 25 54.081" N 81 19.522" W
HA-8 - 25 54.082" N 81 19.503" W
HA-9 - 25 54.081" N 81 19.486" W

SOIL CLASSIFICATION

CORRELATION OF N - VALUES WITH RELATIVE DENSITY AND CONSISTENCY

COHESIONLESS SOIL

N - VALUE	RELATIVE DENSITY
0 - 4	VERY LOOSE
5 - 10	LOOSE
11 - 30	MEDIUM DENSE
31 - 50	DENSE
OVER 50	VERY DENSE

SILTS AND CLAYS

N - VALUE	CONSISTENCY
0 - 2	VERY SOFT
3 - 4	SOFT
5 - 8	FIRM
9 - 15	STIFF
16 - 30	VERY STIFF
31 - 50	HARD
OVER 50	VERY HARD

CORRELATION OF N-VALUES WITH HARDNESS DESCRIPTION LIMEROCK

N - VALUE	RELATIVE DENSITY
0 - 19	VERY SOFT
20 - 49	SOFT
50 - 100	MEDIUM HARD
50 FOR 2 TO 5"	MODERATELY HARD
50 FOR 0 TO 2"	HARD

APPROXIMATE FINES CONTENT	MODIFIERS
5% TO 15%	SLIGHTLY SILTY OR SLIGHTLY CLAYEY
15% TO 25%	SILTY OR CLAYEY
25% TO 49%	VERY SILTY OR VERY CLAYEY

APPROXIMATE SAND/ GRAVEL CONTENT	MODIFIERS
5% TO 15%	SLIGHTLY SANDY OR SLIGHTLY GRAVELY
15% TO 25%	SANDY OR GRAVELY
25% TO 49%	VERY SANDY OR VERY GRAVELY

APPROXIMATE ROOT CONTENT	MODIFIERS
5% - 10%	TRACE
10% - 20%	TRACE TO SOME
20% - 40%	SOME
40% - 60%	AND

FIG. 3 - SOIL BORING PROFILE

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Collier County, Florida
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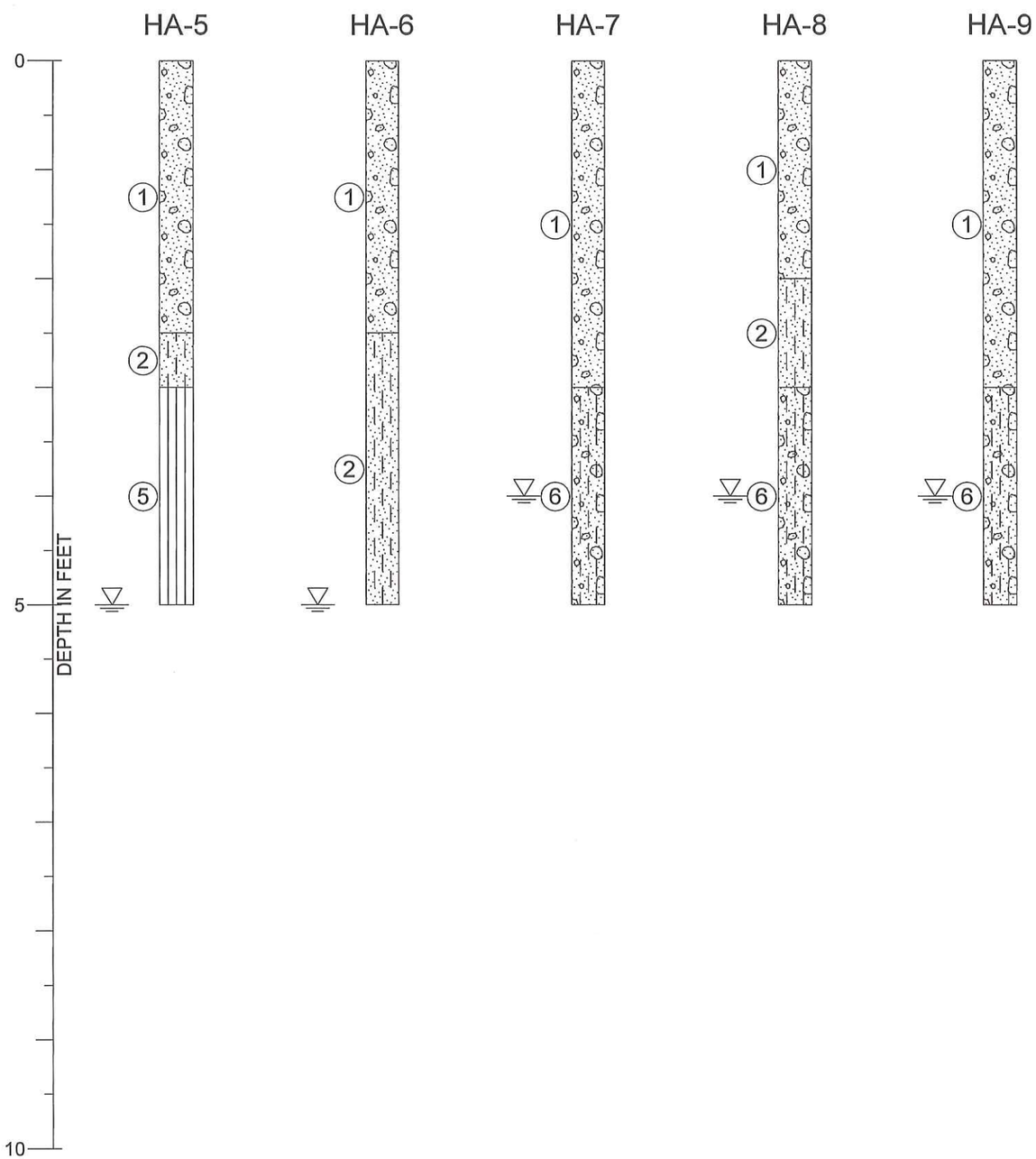
Drawn By: WPG

SOIL PROFILES



SOIL PROFILE LEGEND

B-X = BORING NUMBER

SOIL TYPE (X)

GROUND WATER LEVEL

SOIL SYMBOL

INDICATES PRACTICAL REFUSAL TO BORING EQUIPMENT

= INDICATES GRADUAL TRANSITION IN SOIL TYPES

SOIL LEGEND

1. Light brown to grayish brown and brown to dark brown, slightly silty SAND, with a trace to some gravel, moist (SP-SM),(A-3)
2. Dark brown to grayish brown, silty SAND, wet (SM),(A-2-4)
3. Light gray LIMESTONE, weathered to gravel, silty sand and shell fragments, soft, wet (WLS)
4. Grayish brown, fine SAND, wet (SP),(A-3)
5. Dark brown, silty to very silty SAND, wet (SM),(A-2-4,A-4)
6. Dark brown to grayish brown, slightly silty to silty SAND, with a trace to some gravel and/or shell fragments, wet (SP-SM/SM),(A-3,A-2-4)

NOTES:

GPS COORDINATES OF BORINGS

AB-1 - 26 54.028" N 81 19.584" W
AB-2 - 25 54.081" N 81 19.576" W
HA-1 - 25 54.079" N 81 19.613" W
HA-2 - 25 54.079" N 81 19.631" W
HA-3 - 25 54.081" N 81 19.649" W
HA-4 - 25 54.081" N 81 19.666" W
HA-5 - 25 54.080" N 81 19.558" W
HA-6 - 25 54.082" N 81 19.539" W
HA-7 - 25 54.081" N 81 19.522" W
HA-8 - 25 54.082" N 81 19.503" W
HA-9 - 25 54.081" N 81 19.486" W

SOIL CLASSIFICATION

CORRELATION OF N - VALUES WITH RELATIVE DENSITY AND CONSISTENCY

COHESIONLESS SOIL		SILTS AND CLAYS	
N - VALUE	RELATIVE DENSITY	N - VALUE	CONSISTENCY
0 - 4	VERY LOOSE	0 - 2	VERY SOFT
5 - 10	LOOSE	3 - 4	SOFT
11 - 30	MEDIUM DENSE	5 - 8	FIRM
31 - 50	DENSE	9 - 15	STIFF
OVER 50	VERY DENSE	16 - 30	VERY STIFF
		31 - 50	HARD
		OVER 50	VERY HARD

CORRELATION OF N-VALUES WITH HARDNESS DESCRIPTION LIMEROCK

N - VALUE	RELATIVE DENSITY
0 - 19	VERY SOFT
20 - 49	SOFT
50 - 100	MEDIUM HARD
50 FOR 2 TO 5"	MODERATELY HARD
50 FOR 0 TO 2"	HARD

APPROXIMATE FINES CONTENT	MODIFIERS
5% TO 15%	SLIGHTLY SILTY OR SLIGHTLY CLAYEY
15% TO 25%	SILTY OR CLAYEY
25% TO 49%	VERY SILTY OR VERY CLAYEY

APPROXIMATE SAND/ GRAVEL CONTENT	MODIFIERS
5% TO 15%	SLIGHTLY SANDY OR SLIGHTLY GRAVELY
15% TO 25%	SANDY OR GRAVELY
25% TO 49%	VERY SANDY OR VERY GRAVELY

APPROXIMATE ROOT CONTENT	MODIFIERS
5% - 10%	TRACE
10% - 20%	TRACE TO SOME
20% - 40%	SOME
40% - 60%	AND

FIG. 4 - SOIL BORING PROFILE

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Date: 3/7/07
Job No.: 47-6427
Drawn By: WPG

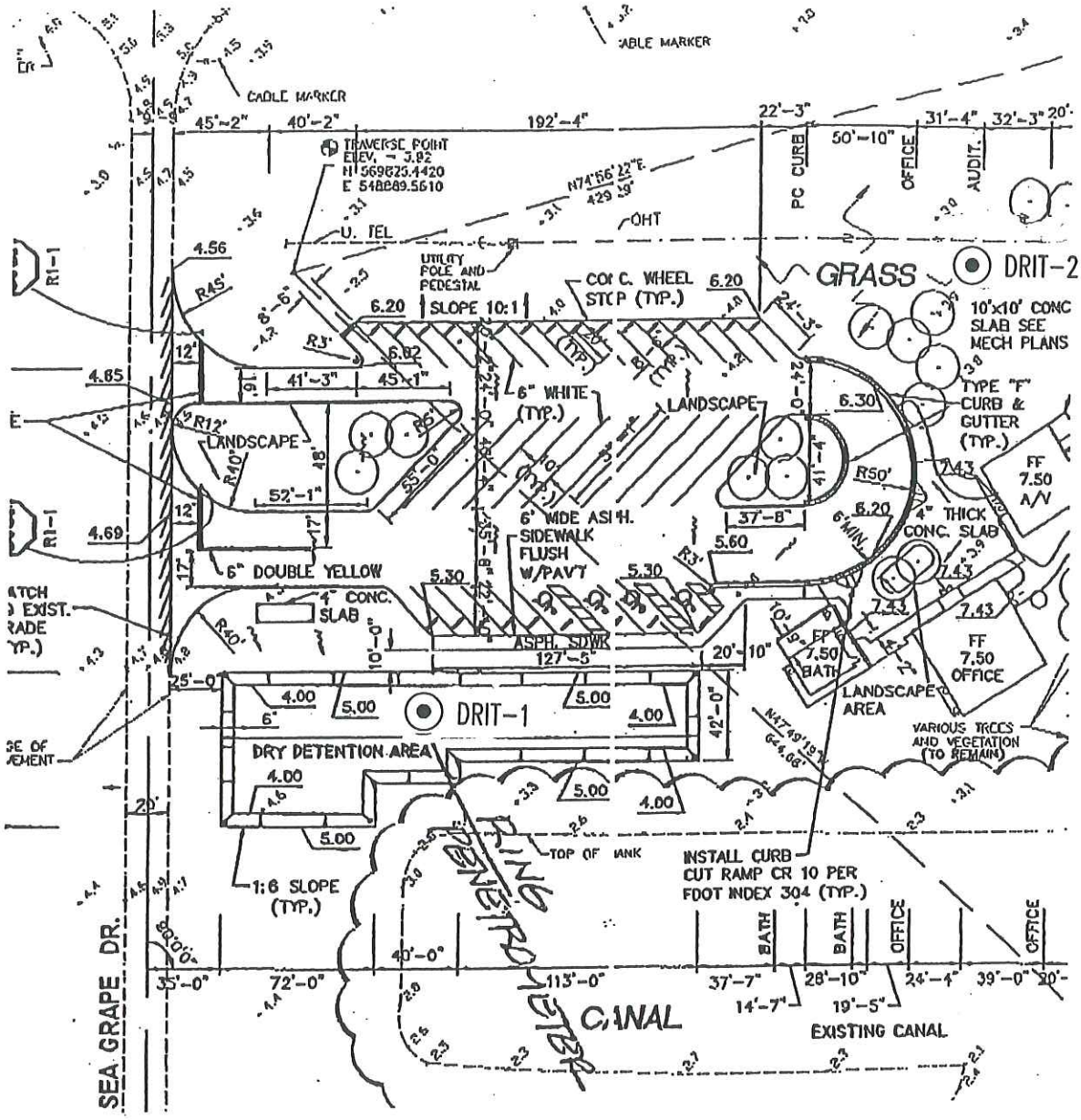
TABLE 1
SUMMARY OF LABORATORY TEST RESULTS
Big Cypress Visitor Center, Collier County, Florida
Allied Project No. 47-4627

Boring No.	Sample No.	Depth Below Existing Grades (ft.)	Gradation test Results (% Passing)					Atterberg Limits		Description	Strata No.	USCS
			No. 4	No. 10	No. 40	No. 100	No. 200	Liquid Limit %	Plasticity Index %			
AB-1	S-2	3.5-5	100	89.7	75.4	30.0	17.9	-	-	Dark brown, silty SAND, wet	2	SM
AB-2	S-3	4-6	100	100	91.8	49	37.5	26	4	Dark brown, silty SAND	5	SM
HA-1	S-2	2-3	100	53.7	37.7	12.6	7.7	-	-	Grayish brown, slightly silty SAND, some gravel, wet	1	SP-SM
HA-3	S-2	2-3	100	100	76.6	50.5	39.9	27	4	Dark brown, silty SAND, wet	5	SM
HA-5	S-3	3-5	100	99.7	89.7	45.5	33.9	-	-	Dark brown, silty SAND, wet	5	SM
HA-6	S-2	2.5-3	100	91.1	77	30.8	16.3	N/P	N/P	Dark brown, silty SAND, trace of gravel, wet	2	SM
HA-7	S-2	2-3	100	72.6	61.5	20.3	9.7	-	-	Dark brown, slightly silty SAND, wet	1	SP-SM
HA-8	S-3	3-5	100	63.5	50.5	16.8	9.9	-	-	Dark brown, slightly silty SAND, some gravel, wet	6	SP-SM

APPENDIX A

Double Ring Infiltrometer Test Results

FIGURE 3 – DOUBLE RING INFILTRATION TEST LOCATIONS



NOTE: BASE DRAWING PROVIDED BY CLIENT.

SPT BORING LOCATION

DOUBLE RING INFILTRATION TEST LOCATION

ALLIED ENGINEERING AND TESTING, INC.

5300 Lee Boulevard, Lehigh Acres, Florida P.O. BOX 754, LEHIGH ACRES, FL 33970-0754 941-334-6833

Client:	GEC Architecture, Inc.	Date:	6/3/04
Project:	New Visitor Center, Big Cypress National Preserve Collier County, Florida	Job No.:	44-5929
Approved By:	Jeff D'huyvetter	Drawn By:	CM

DOUBLE RING INFILTROMETER TEST RESULTS

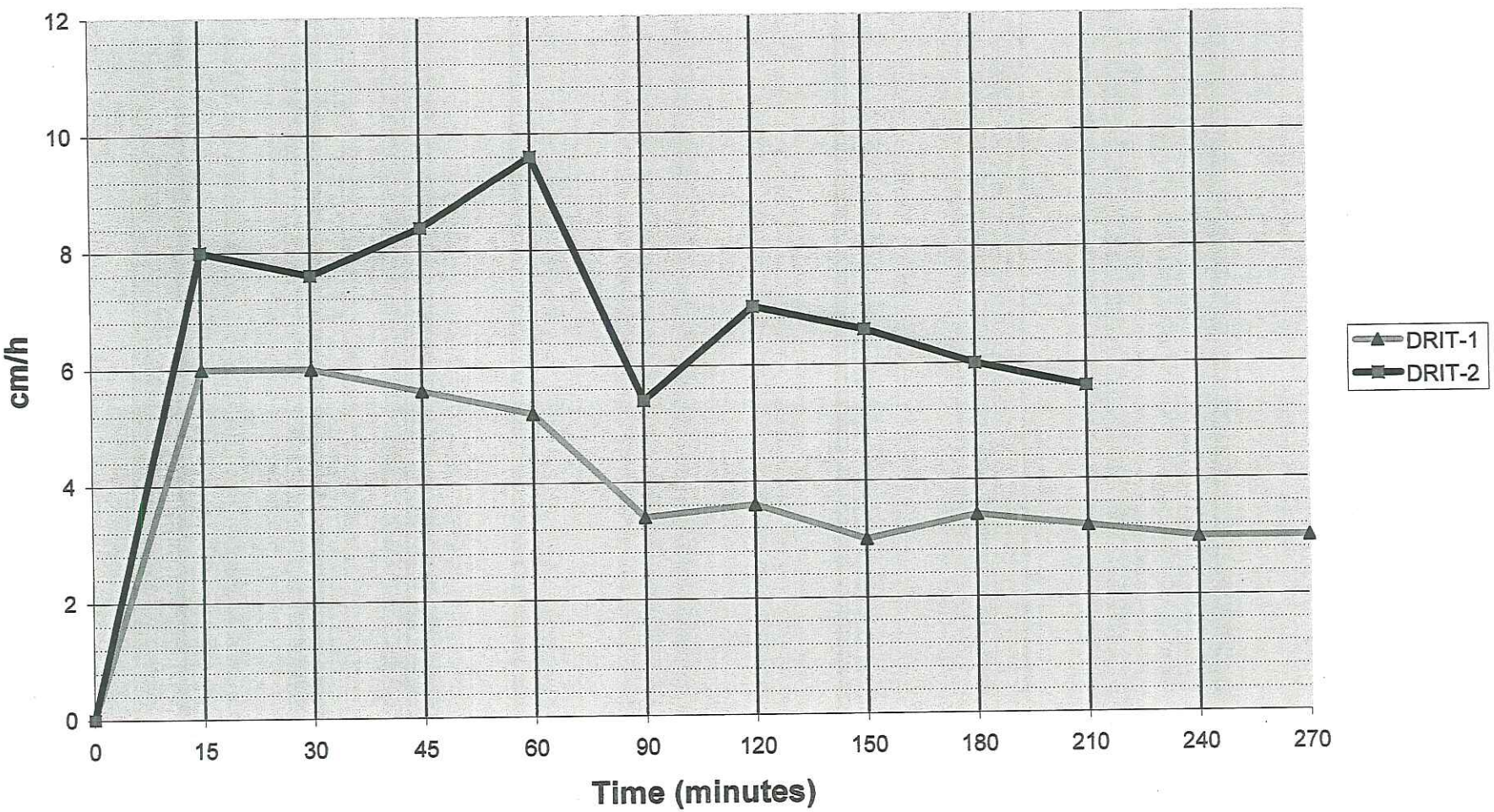
BIG CYPRESS VISITOR CENTER

ALLIED PROJECT NO. 44-5929

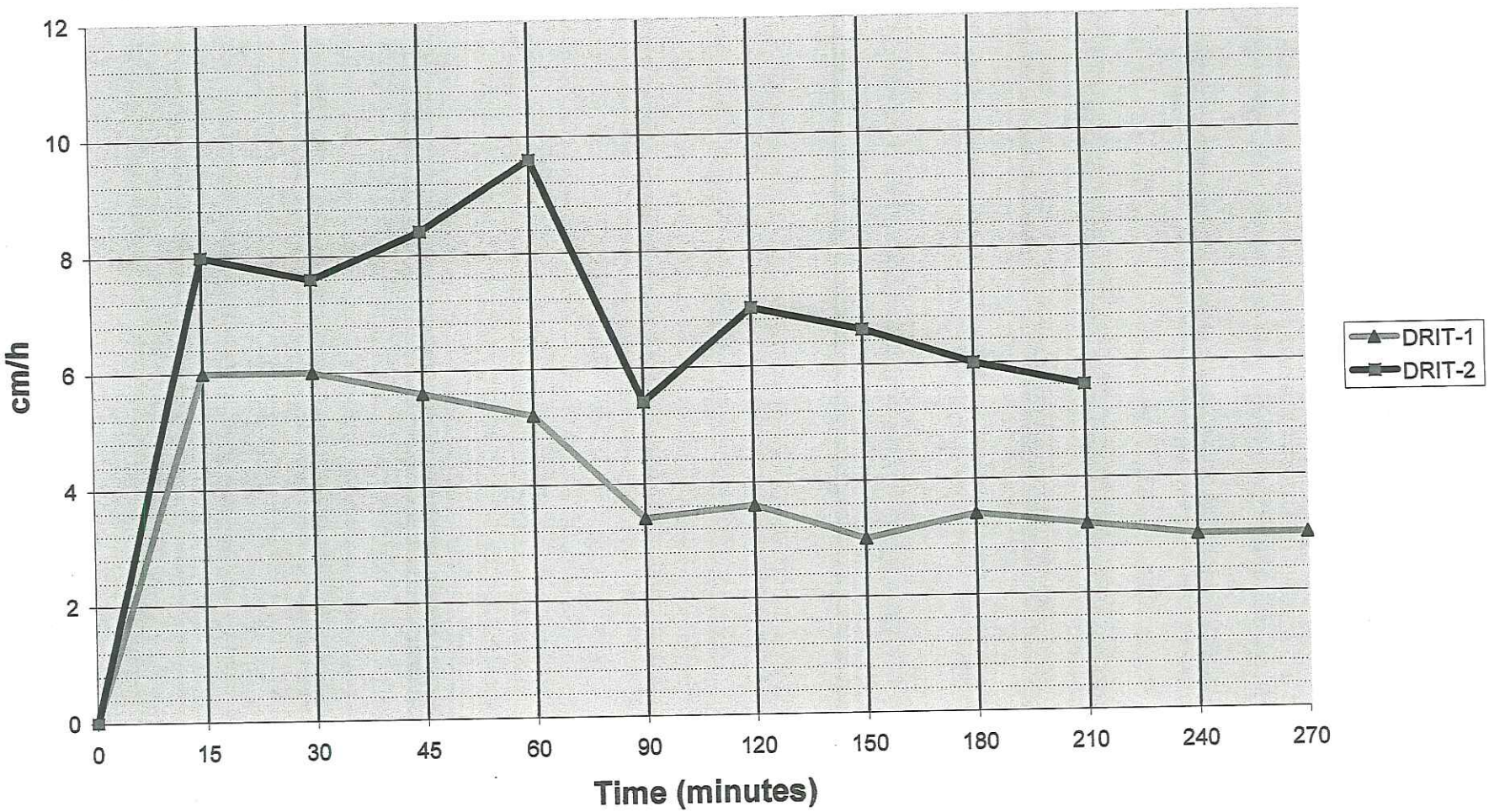
Depth of Water Table	+/- 3 feet	Water Temperature	+/- 26° C
Inner Ring Diameter	30 cm	Inner Ring Penetration	5 cm
Outer Ring Diameter	10 cm	Outer Ring Penetration	10 cm

Test No.	Trial No.	Time	Time Interval (n)	Drop in Water Level (cm)		Incremental Infiltration Velocity	
				Inner Ring	Outer Ring	Inner Ring	Outer Ring
DRIT - 1	1	10:30 to 10:45	0.25	1.5	2	6	8
	2	11:00	0.25	1.5	2.1	6	8.4
	3	11:15	0.25	1.4	2.2	5.6	8.8
	4	11:30	0.25	1.3	2	5.2	8
	5	12:00	0.5	1.7	3	3.4	6
	6	12:30	0.5	1.8	3.3	3.6	6.6
	7	13:00	0.5	1.5	3.5	3	7
	8	13:30	0.5	1.7	3.3	3.4	6.6
	9	14:00	0.5	1.6	3.2	3.2	6.4
	10	14:30	0.5	1.5	3.2	3	6.4
	11	15:00	0.5	1.5	3	3	6
DRIT - 2	1	10:35 to 10:50	0.25	2	2.4	8	9.6
	2	11:05	0.25	1.9	2.5	7.6	10
	3	11:20	0.25	2.1	2.4	8.4	9.6
	4	11:35	0.25	2.4	2	9.6	8
	5	12:05	0.5	2.7	2.9	5.4	5.8
	6	12:35	0.5	3.5	3.4	7	6.8
	7	13:05	0.5	3.3	3.7	6.6	7.4
	8	13:35	0.5	3	3.5	6	7
	9	14:05	0.5	2.8	3.6	5.6	7.2

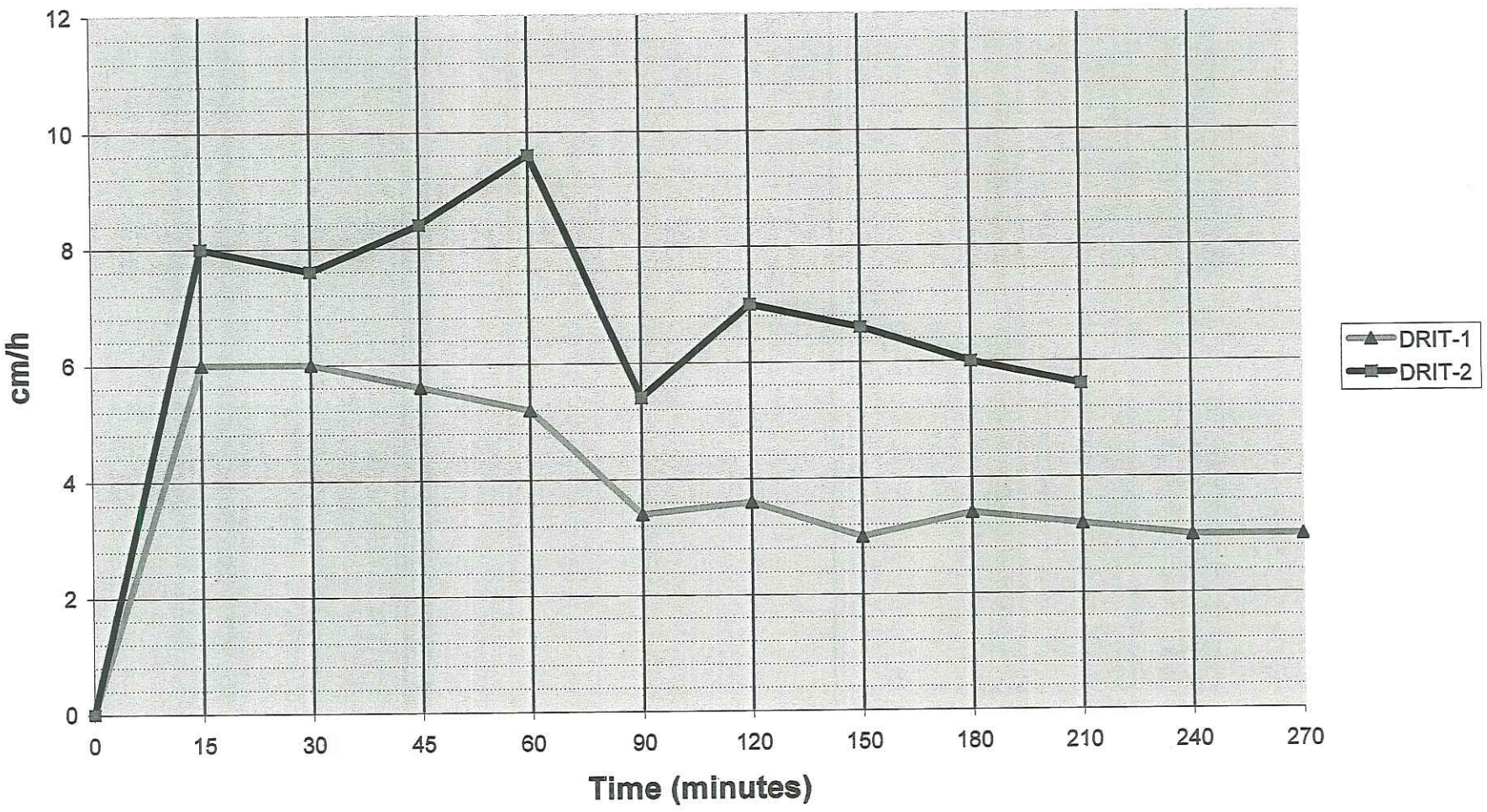
Incremental Infiltration Rate
Big Cypress Visitor Center
Allied Proj. No.: 44-5929



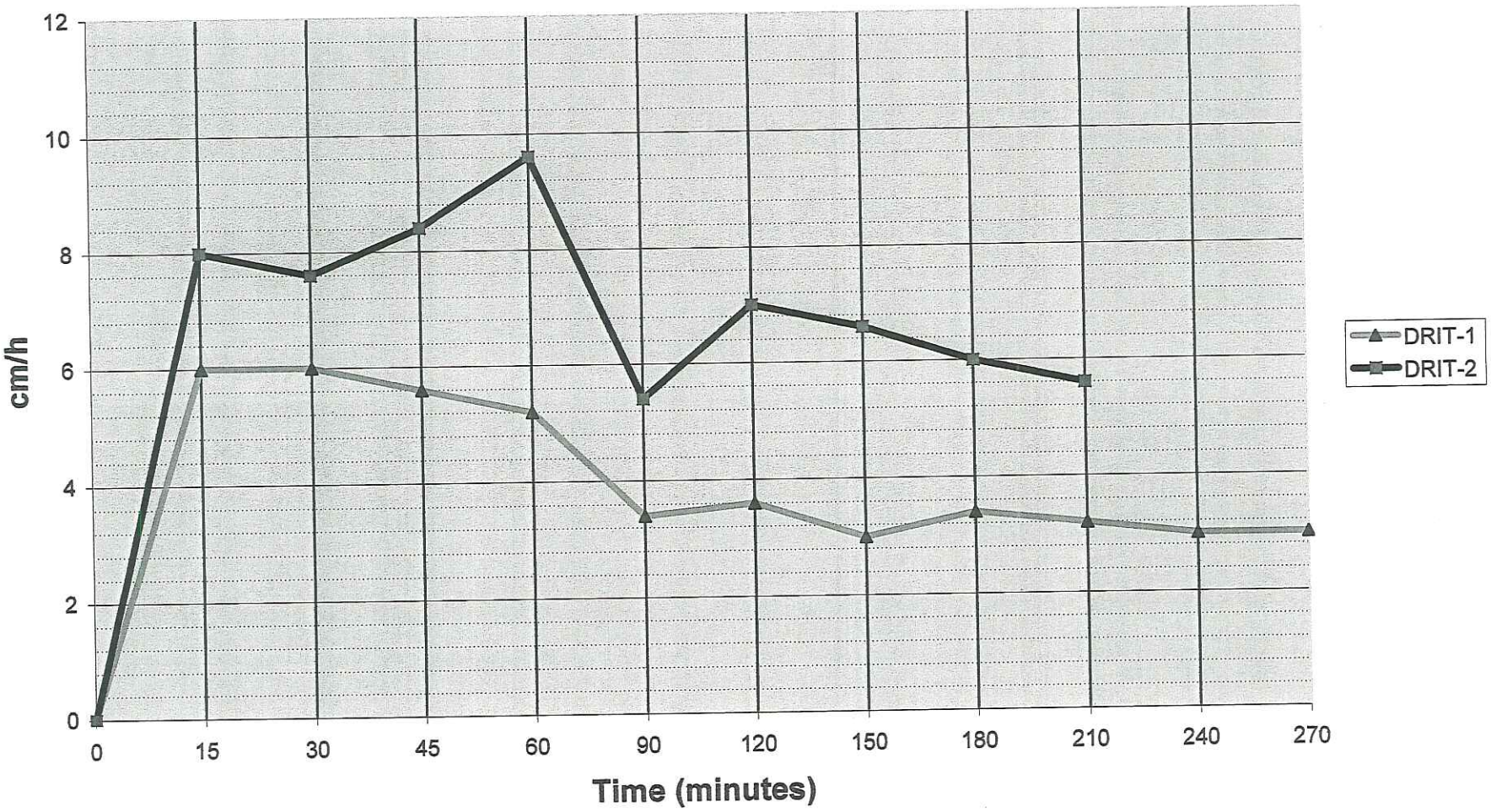
Incremental Infiltration Rate
Big Cypress Visitor Center
Allied Proj. No.: 44-5929



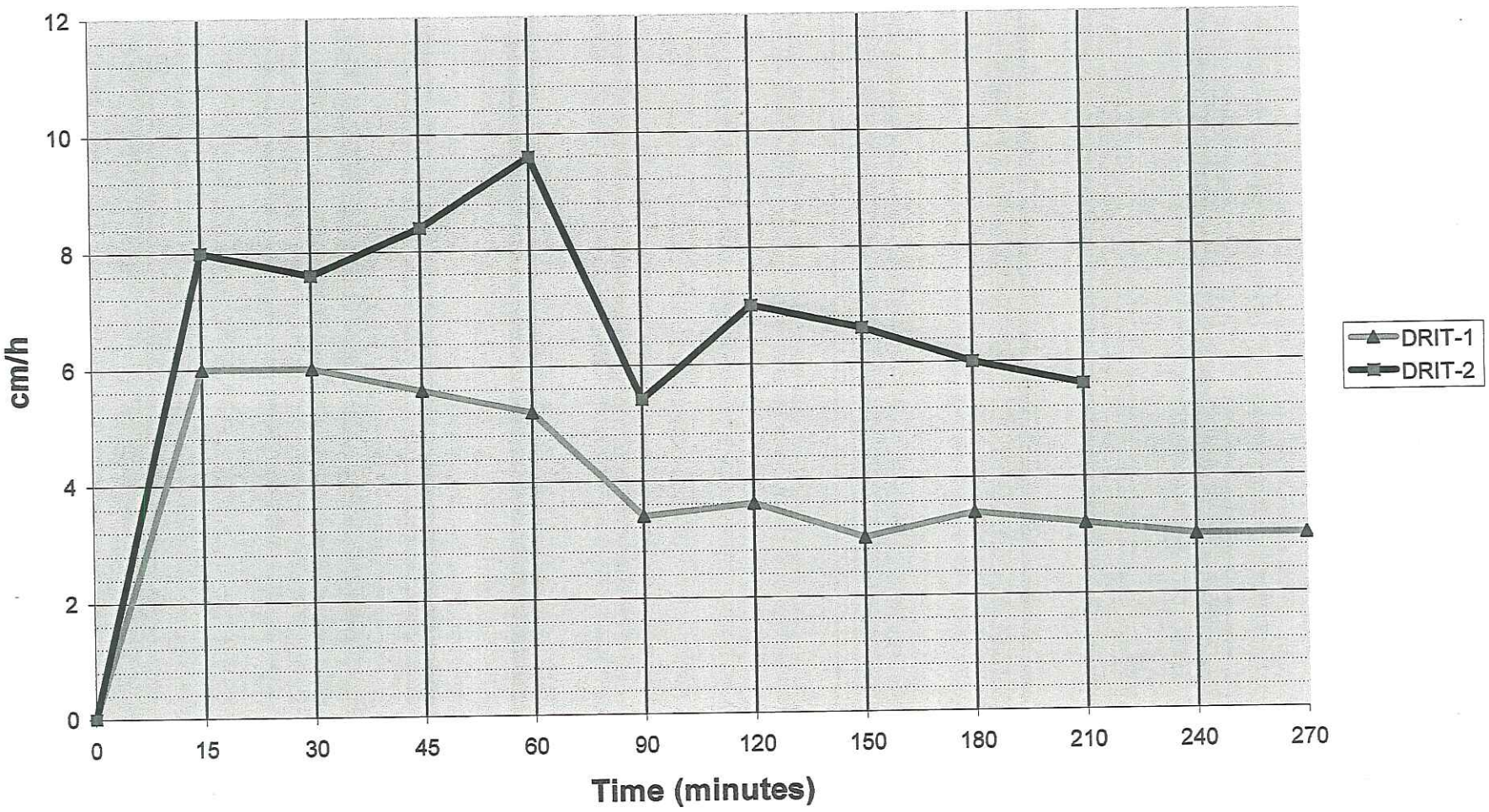
Incremental Infiltration Rate
Big Cypress Visitor Center
Allied Proj. No.: 44-5929



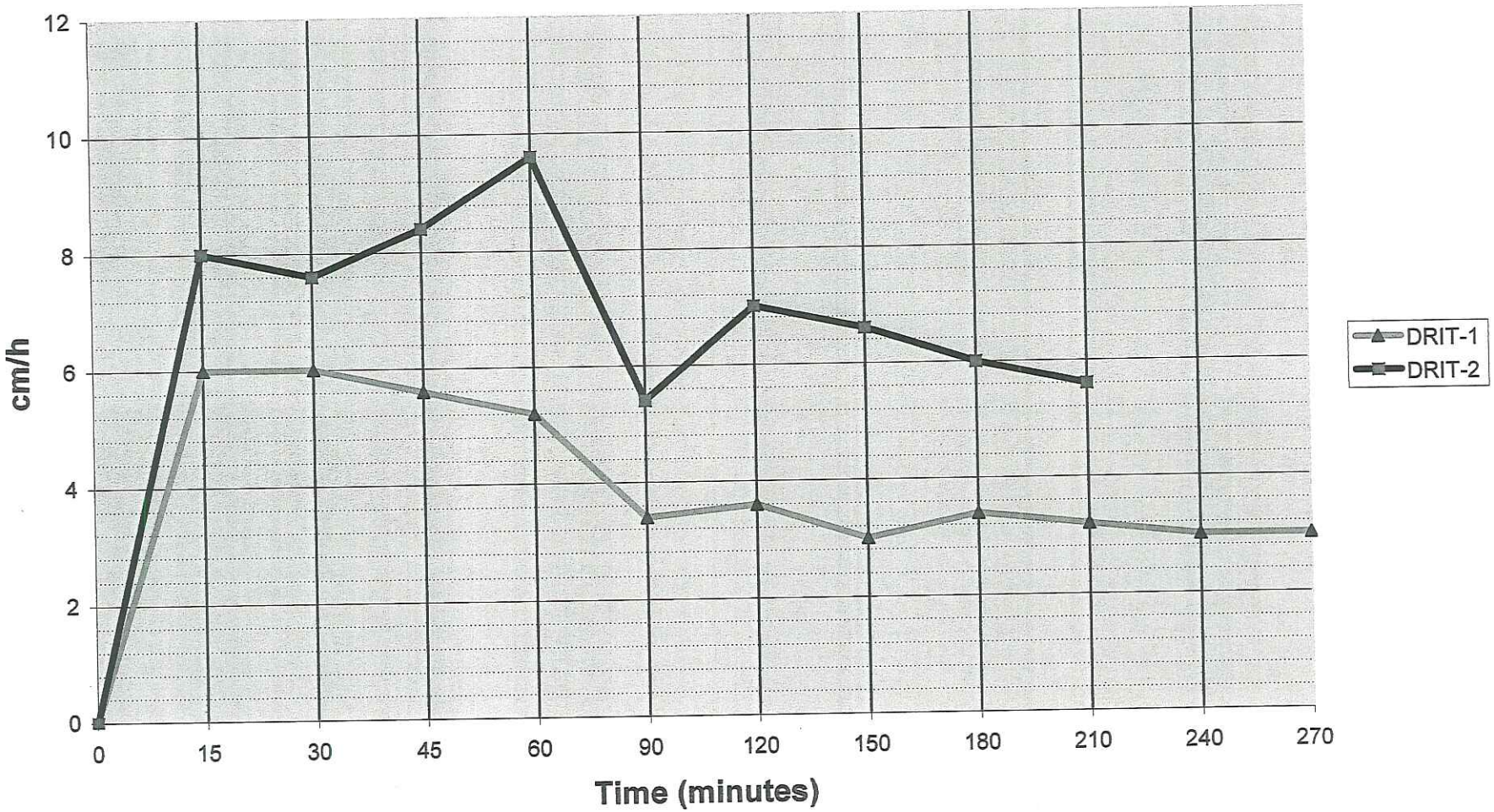
Incremental Infiltration Rate
Big Cypress Visitor Center
Allied Proj. No.: 44-5929



Incremental Infiltration Rate
Big Cypress Visitor Center
Allied Proj. No.: 44-5929

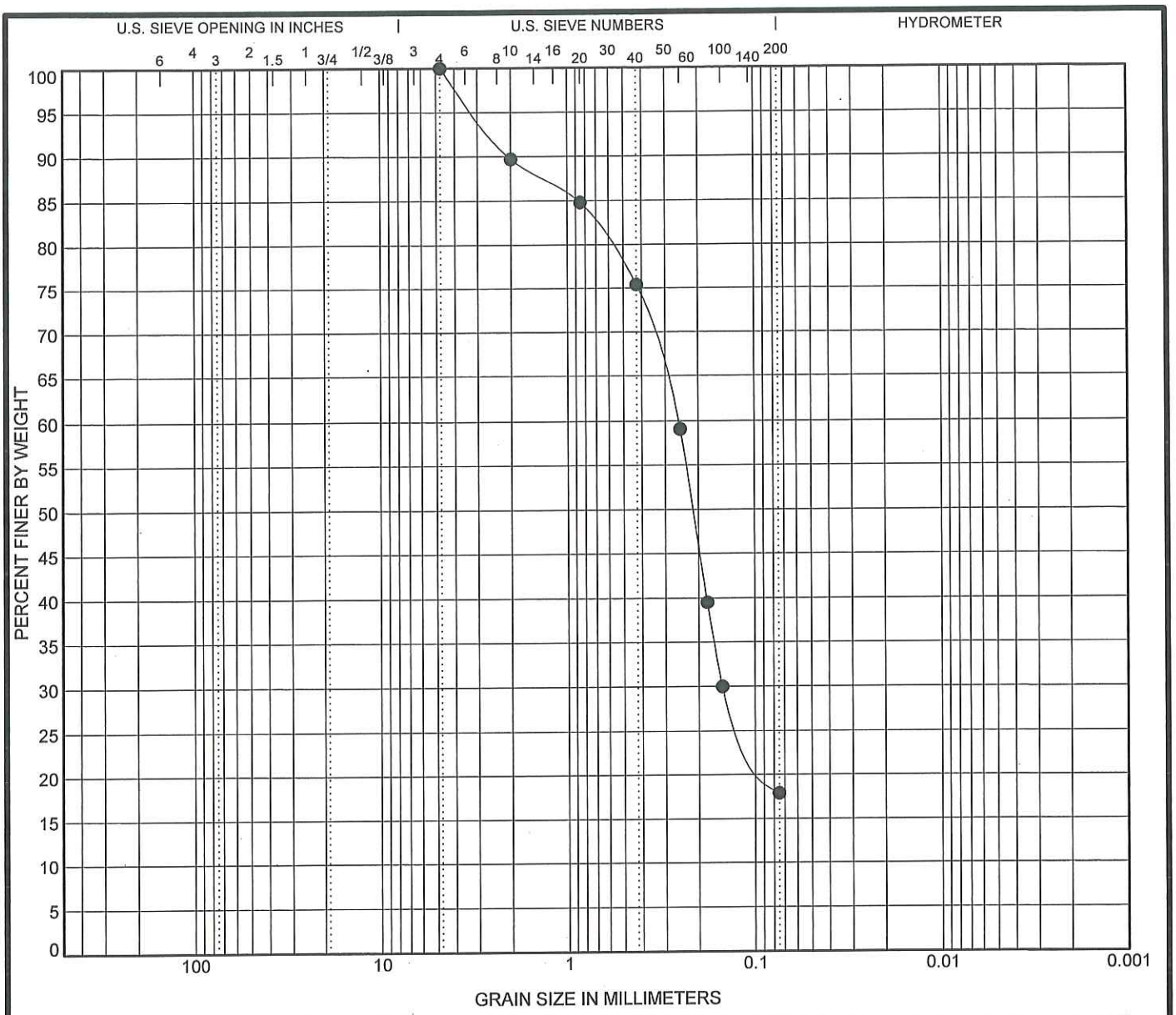


Incremental Infiltration Rate
Big Cypress Visitor Center
Allied Proj. No.: 44-5929



APPENDIX B

Gradation Test Results



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	AB-1	10.0	**Dark brown, silty SAND (SM)**					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AB-1	10.0	**4.75**	**0.257**	**0.15**		**0.0**	**82.1**	**17.9**	

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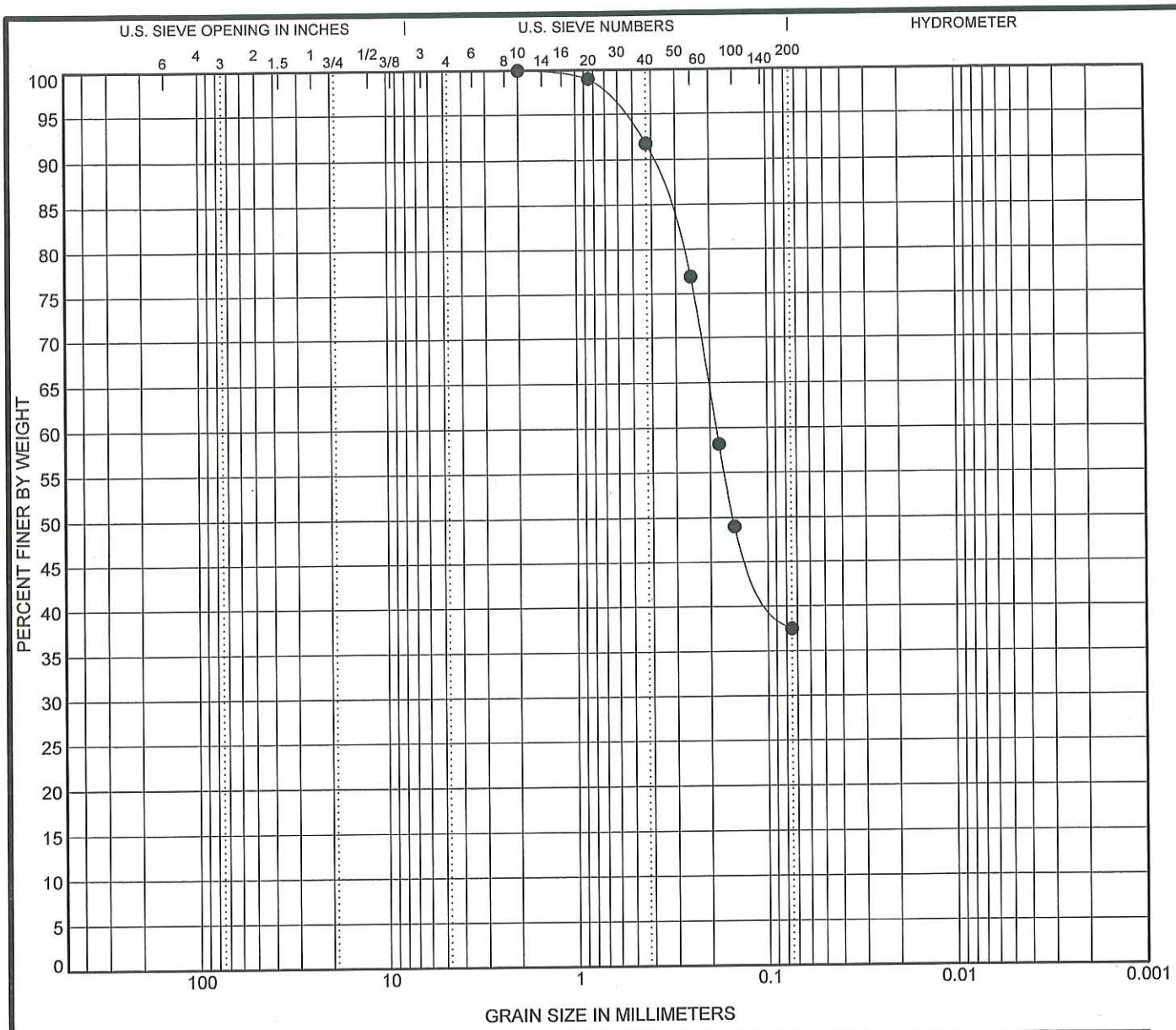
Project: Big Cypress Visitor Center
Location: Collier County, Florida
Job No.: 47-6427



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● AB-2	10.0	**Dark brown, silty SAND (SM)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● AB-2	10.0	2	0.186			0.0	62.5	37.5	

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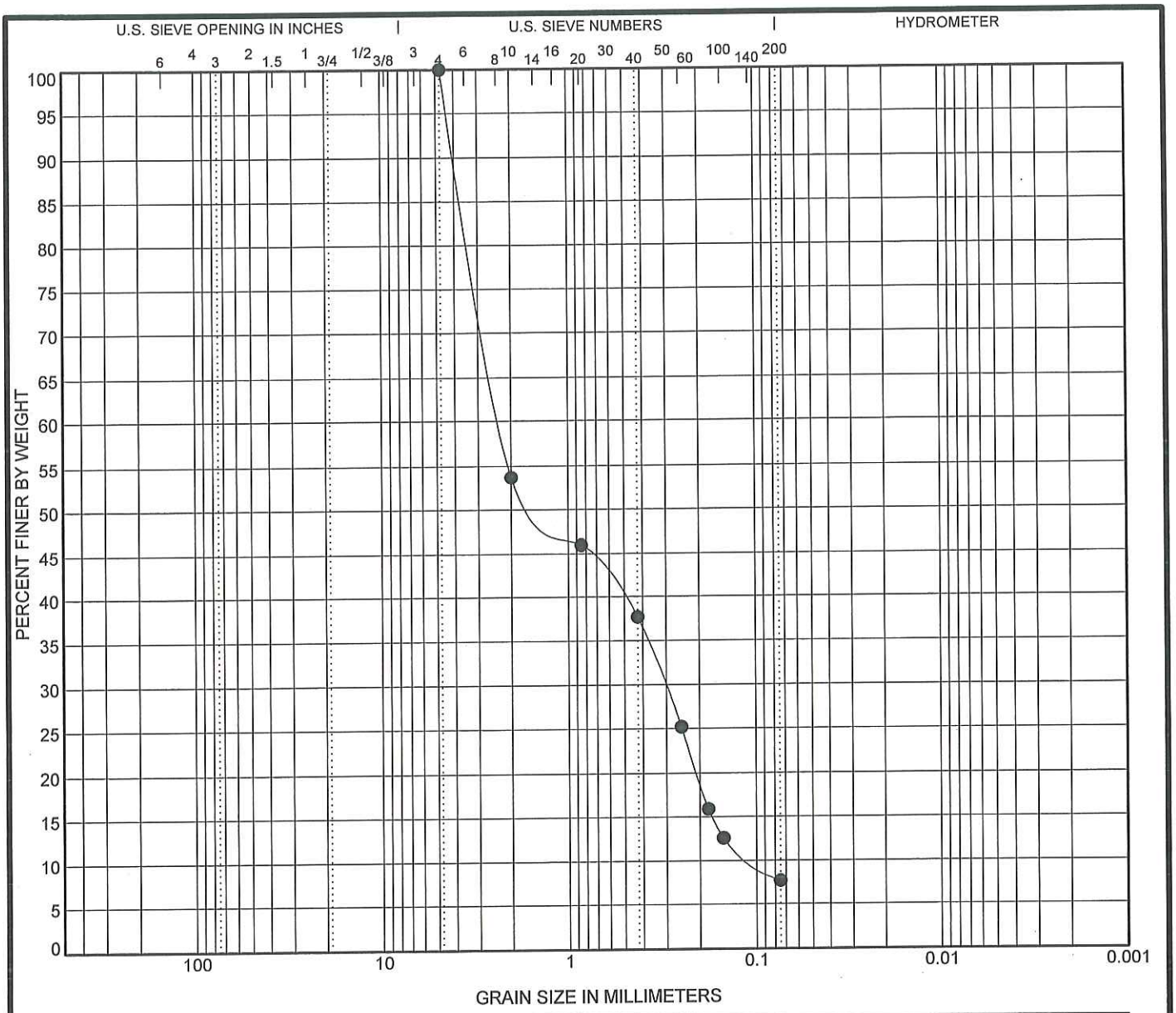

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	**HA-1**	**5.0**	**Grayish brown, slightly silty SAND, some gravel (SP-SM)**				**0.40**	**21.67**

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**HA-1**	**5.0**	**4.75**	**2.25**	**0.307**	**0.104**	**0.0**	**92.3**	**7.7**	

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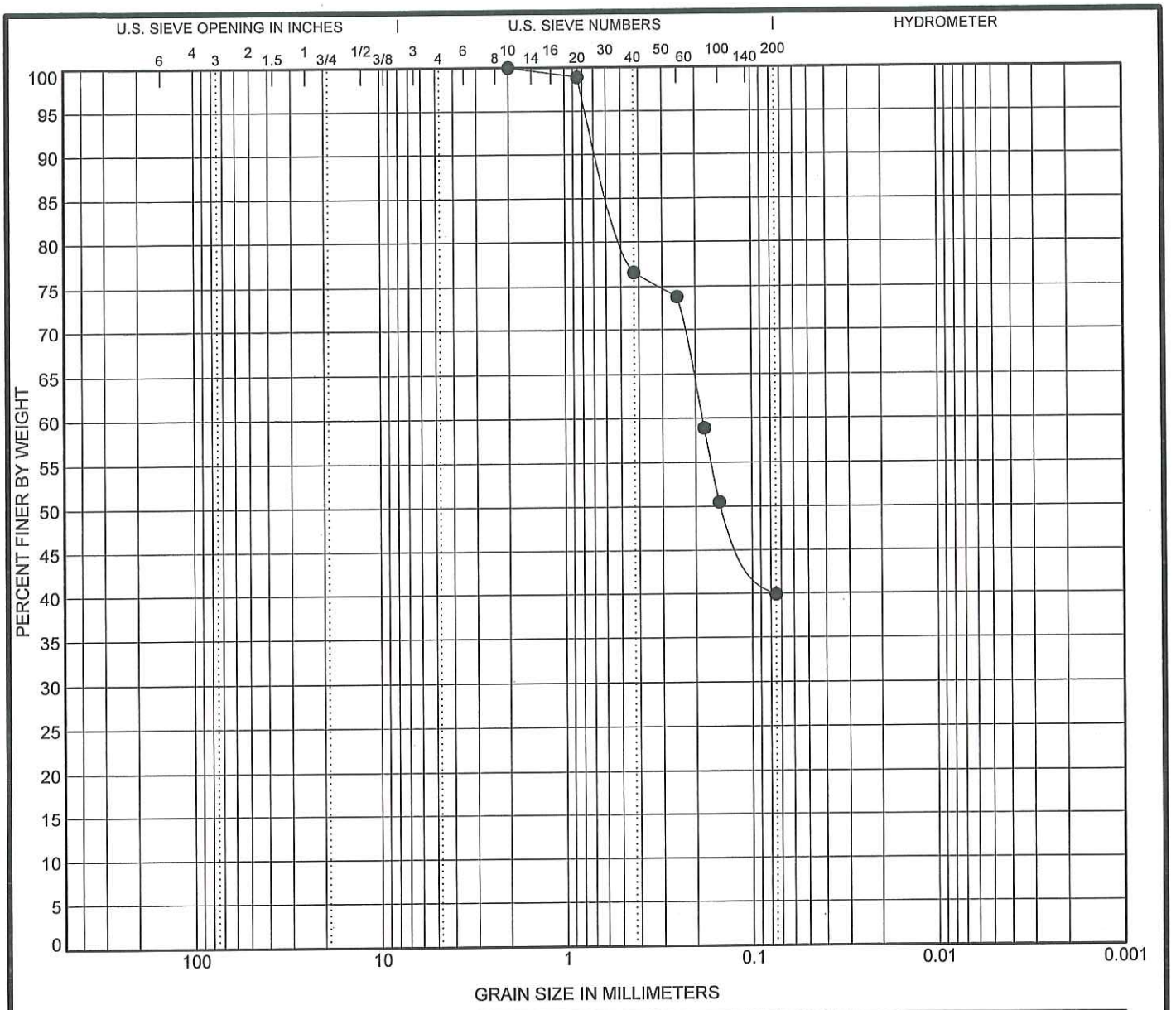

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	HA-3	5.0	Dark brown, silty SAND (SM)					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	HA-3	5.0	2	0.184			0.0	60.1	39.9	

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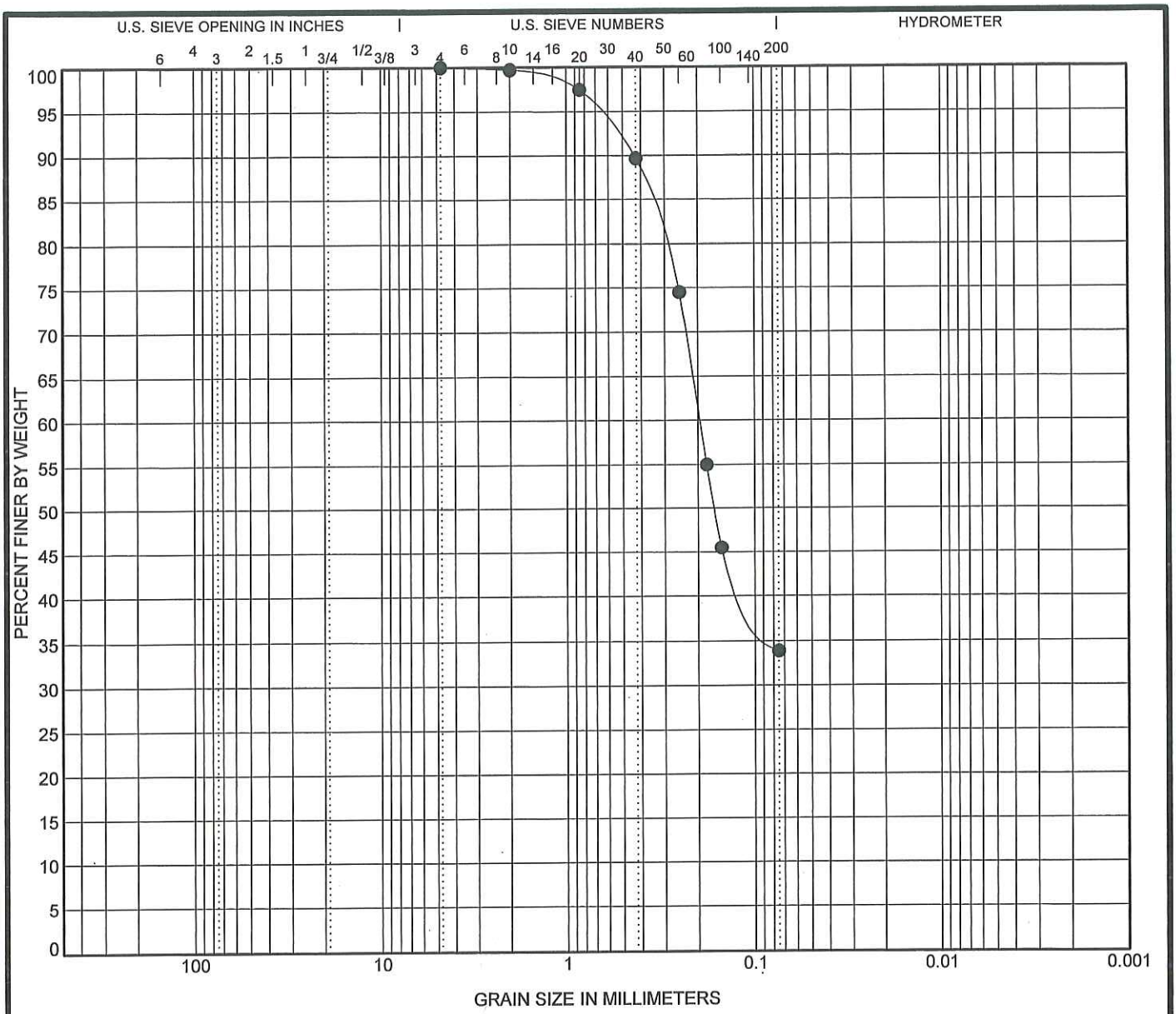

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	HA-5	5.0	**Dark brown, silty SAND (SM)**					

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	HA-5	5.0	**4.75**	**0.196**			**0.0**	**66.1**	**33.9**	

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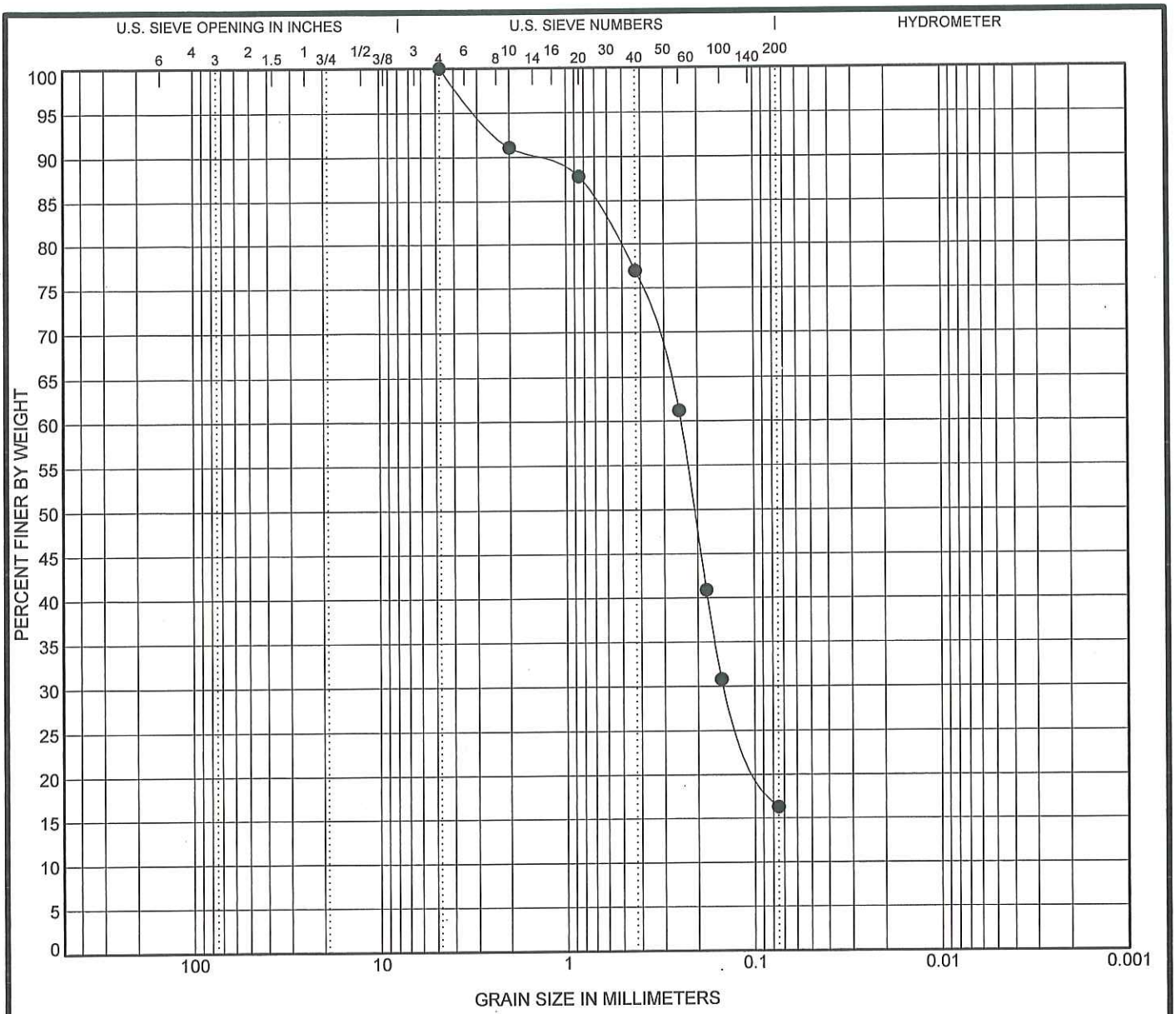

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● HA-6	5.0	**Dark brown, silty SAND, trace of gravel (SM)**					

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● HA-6	5.0	**4.75**	**0.245**	**0.144**		**0.0**	**83.7**	**16.3**	

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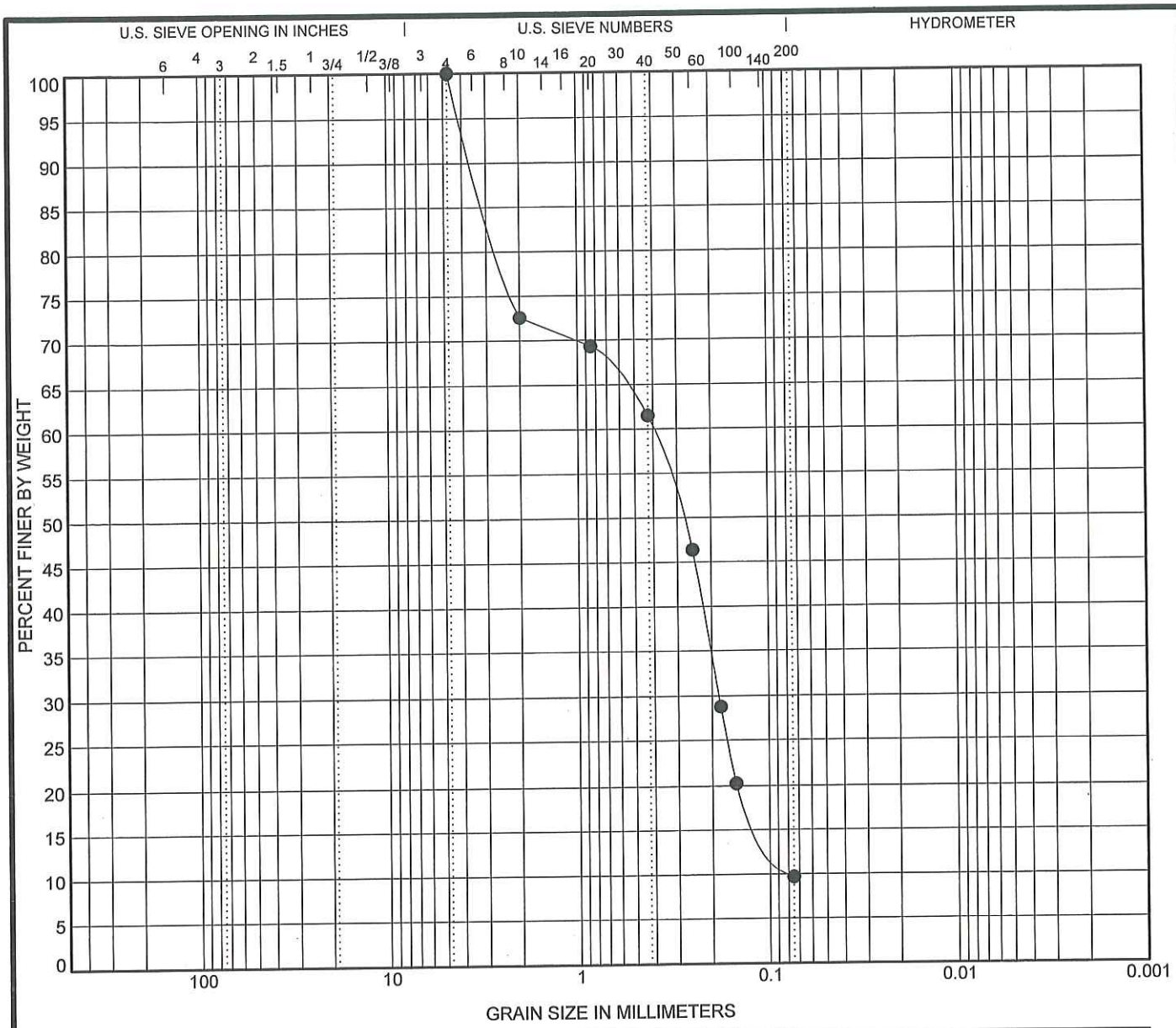

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● HA-7	5.0	**Dark brown, slightly silty SAND, some gravel (SP-SM)**				**1.10**	**5.27**

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● HA-7	5.0	**4.75**	**0.403**	**0.184**	**0.076**	**0.0**	**90.3**	**9.7**	

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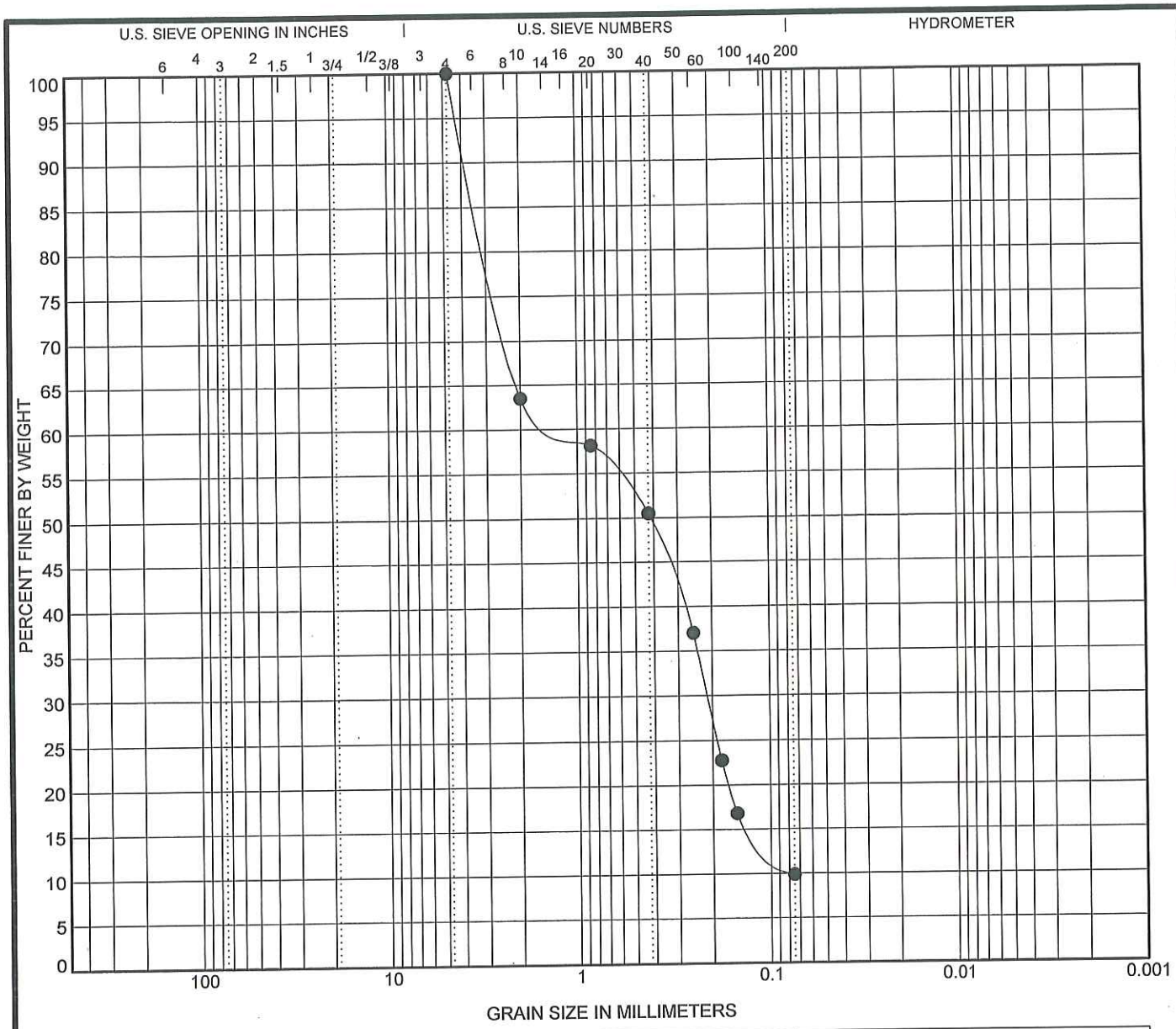
US GRAIN SIZE 47-6427.GPJ ALLIED ENG TESTING.GDT 3/7/07



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● HA-8	5.0	**Dark brown, slightly silty SAND, some gravel (SP-SM)**				**0.52**	**15.16**

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● HA-8	5.0	**4.75**	**1.149**	**0.213**	**0.076**	**0.0**	**90.1**	**9.9**	

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