APPENDIX

FORMS AND OTHER PROJECT DOCUMENTATION

Table of Contents

VERIFICATION OF EMPLOYMENT ELIGIBILITY FORM

PER FLORIDA STATUTE 448.095, CONTRACTORS AND SUBCONTRACTORS MUST REGISTER WITH AND USE THE E-VERIFY SYSTEM TO VERIFY THE WORK AUTHORIZATION STATUS OF ALL NEWLY HIRED EMPLOYEES.

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE BID/PROPOSAL. FAILURE TO SUBMIT THIS FORM AS REQUIRED MAY DEEM YOUR SUBMITTAL NONRESPONSIVE.

The affiant, by virtue of the signature below, certifies that:

1. The Contractor and its Subcontractors are aware of the requirements of Florida Statute 448.095.
2. The Contractor and its Subcontractors are registered with and using the E-Verify system to verify the work authorization status of newly hired employees.
3. The Contractor will not enter into a contract with any Subcontractor unless each party to the contract registers with and uses the E-Verify system.
4. The Subcontractor will provide the Contractor with an affidavit stating that the Subcontractor does not employ, contract with, or subcontract with unauthorized alien.
5. The Contractor must maintain a copy of such affidavit.
6. The City may terminate this Contract on the good faith belief that the Contractor or its Subcontractors knowingly violated Florida Statutes 448.09(1) or 448.095(2)(c).
7. If this Contract is terminated pursuant to Florida Statute 448.095(2)(c), the Contractor may not be awarded a public contract for at least 1 year after the date on which this Contract was terminated.
8. The Contractor is liable for any additional cost incurred by the City as a result of the termination of this Contract.

_____
Authorized Signature

_____
Printed Name

_____
Title

_____
Name of Entity/Corporation

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization on, this _____ day of _____, 20____, by _____ (name of person whose signature is being notarized) as the _____ (title) of _____ (name of corporation/entity), personally known _____, or produced _____ (type of identification) as identification, and who did/did not take an oath.

_____
Notary Public

_____
Printed Name

My Commission Expires: _____
NOTARY SEAL ABOVE

PROJECT PERMITS

GEOTECHNICAL SOIL REPORT

DRIGGERS ENGINEERING SERVICES INCORPORATED
Geotechnical Engineering & Construction Materials Testing

REPORT OF
THE GEOTECHNICAL INVESTIGATION

Water Main Replacements
Island Estates
Clearwater, Florida

DESI Project No. DES 239057

Prepared for
CHA Consulting, Inc.
3507 East Frontage Road, Suite 180
Tampa, Florida
Attention: Mr. Weston T. Haggen

Prepared by
DRIGGERS ENGINEERING SERVICES, INC.
P.O. Box 17839
12220 49th Street North
Clearwater, Florida 33762

April 26, 2023

Sarasota
Phone: 727.471.6655
Fax: 941.371.8962
saroffice@driggers-eng.com

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sphillwoffice@driggers-eng.com

DRIGGERS ENGINEERING SERVICES INCORPORATED
Geotechnical Engineering & Construction Materials Testing

April 27, 2023

CHA Consulting, Inc.
3507 East Frontage Road
Suite 180
Tampa, Florida 33607

Attn: Mr. Weston T. Haggen, P.E.

RE: Report of the Geotechnical Investigation
Water Main Replacements
Island Estates
Clearwater, Florida
Our File: DES 239057

Dear Mr. Haggen:

In accordance with your authorization, **DRIGGERS ENGINEERING SERVICES, INC.** has completed the requested program of Standard Penetration Test (SPT) borings along the alignment of various portions of water mains that are planned for replacement. Presented herein are the results of our field and laboratory testing together with geotechnical recommendations for your consideration.

FIELD INVESTIGATION PROGRAM

Plates I-A through I-D of the report illustrations identifies the respective positioning of fourteen (14) Standard Penetration Test (SPT) borings that were requested. In general, the test borings were drilled within a few feet of the locations identified on the plans which you provided. One exception was test boring P-8 which we off-set approximately 63 feet to the East to avoid damaging newly placed sod. The Standard Penetration Test method of sampling was utilized in our investigation. However, the upper 6 feet was advanced by hand auger borings as a double-check for the presence of any underground utilities that may not have been appropriately identified. Within the upper 6 feet, hand cone penetration testing was performed to provide information as to the relative consistency of the soils penetrated.

Beginning at 6 feet, Standard Penetration Test sampling was performed in accordance with ASTM D-1586. Logs of all of the test borings are presented in the report attachments providing information as to Standard Penetration resistance values in graphical and tabular form together with soil classification utilizing both the Unified and AASHTO Soil Classification systems.

LABORATORY TESTING

A limited laboratory testing program was undertaken to aid in characterizing the engineering properties of the subsurface soils. Our laboratory tests included grainsize analyses, Atterberg Limits determinations and organic content tests. The results of our laboratory tests are included in the report attachments.

GENERALIZED SUBSURFACE SOIL CONDITIONS

Plates II-A through II-C of the report appendix present the results of the test borings in profile. As seen, the test borings generally revealed the presence of fine sands with variable silt, shell and clay fines content extending to the requested investigation depth of 10 feet. However, a significant number of the test borings encountered seams of moderate to high plasticity clays with variable silt and sand content typically varying in thickness from the order of some 1 to 3 feet. These shallow, comparatively soft silty clays are a byproduct of the disposal of dredged fill materials created during the construction of the neighboring intracoastal waterways.

At two locations, P-5 and P-10, a variable thickness zone of fibrous highly organic material was encountered (Peat). These zones represent areas where surface vegetation existed prior to the dredged disposal of the overlying fill materials.

Plate III of the report illustrations identifies the depth range where compressible, relatively shallow clays were encountered as well as highly organic peat deposits. Plate III also summarizes the depth at which groundwater was encountered at each of the test boring locations. As seen, groundwater was encountered in the depth range of about 1.4 feet to as much as 7.9 feet below existing grade but typically in the depth range of 2.5 to 4.5 feet below existing grade. It should be noted that these groundwater observations were obtained during a period of negligible rainfall. One would certainly anticipate that groundwater levels may be on the order of 1 to 2 foot higher during the normal wet season and even higher during major storm events. The depth to groundwater and approximate estimated ground surface elevations are also noted on Plate III of the attachments.

GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

PLANNED IMPROVEMENTS – The water main replacements will consist typically of 8 to 12 inch ductile iron pipe that will commonly be installed by direct embedment with a nominal 3 to 4 feet of cover. Pipe bursting with HDPE piping will also be incorporated in localized areas wherein new piping will be installed in the old pipe.

PIPE SUBGRADE SOIL CONDITIONS – In general, our geotechnical investigation identifies that the subgrade soils within the depths contemplated for construction consists predominantly of sandy soils comprising the SP to SP-SM and SM Unified Soil Classification or the AASHTO A-3 Soil Classification. These types of soils are generally suitable for providing subgrade support with routine subgrade preparation in accordance with applicable City of Clearwater specifications. Moisture content should certainly be controlled within ± 2% of the optimum to facilitate stability and proper compaction. Some pipe settlement should be contemplated but would generally be expected to be on the order of 1 inch or less with the settlement primarily occurring relatively rapidly following backfill placement.

As previously pointed out, a number of test borings identified seams of soft silty clays that are likely to occur at or below the embedment depth of the piping. Other locations encountered some highly organic fibrous peat soils in the depth range of 5 to 6 feet and in some cases deeper. These types of soils certainly have the potential for producing increased settlement associated with compression and decomposition of organic materials. Accordingly, where present, these material types should be over-excavated and replaced with suitable backfill materials beneath new piping including a margin of at least 1 foot outside the pipe diameter. In areas where gravel may be incorporated, we recommend that the gravel consists of a FDOT No.57 gravel. The gravel should be completely wrapped, bottom, sides and top, with a geotextile fabric corresponding to a Tencate (Mirafi) 140N or equivalent. This fabric should be overlapped a minimum of 12-inches. The gravel bedding would also provide an effective drainage blanket to assist in the collection of groundwater and surface water during construction.

SUITABILITY OF EXCAVATED SOILS FOR USE AS BACKFILL – In general, the majority of the soils excavated for the pipe embedment will be suitable from a geotechnical perspective for reuse as compacted backfill with proper moisture control and compaction. Commonly, suitable soil types would include fine sands and slightly silty sands frequently having a variable shell content comprising the SP to SP-SM or AASHTO A-3 Soil Classification. Occasionally, silty sands comprising the SM Unified Soil Classification and the A-2-4 AASHTO

Classification could also be utilized. However, project specification requirements may be more stringent and these soils may not be considered acceptable. Where permissible, it is likely that A-2-4 or SM soils may have an elevated moisture content and warrant mixing and aeration with soils with a reduced fines content in order to obtain appropriate compaction. In general, it is recommended that moisture contents be controlled within ± 2% of optimum as established by the Modified Proctor moisture density relationship of AASHTO T-180. The moderate to high plasticity silty clays and organic soils would not be considered suitable for use as backfill.

GEOTECHNICAL CONSTRUCTION CONSIDERATIONS

As previously stated, it is anticipated that the vast majority of the new piping will be installed in an open excavation. Certainly, the contractor must comply with applicable OSHA Trench Safety requirements as well as applicable City of Clearwater standards for pipe construction. In any event, we would recommend constructing slopes no steeper than 1.5 horizontal to 1.0 vertical provided that effective dewatering is developed and maintained throughout the excavation pipe placement and backfill operations.

It is certainly conceivable that in localized areas it may be beneficial to incorporate trench box type construction to minimize the lateral extent of excavations. Where trench boxes are utilized, care must be exercised to compact all backfill soils including the volume of soil occupied by the trench box as the trench box is being raised to advance. Without proper compaction of the volume of soil temporarily displaced by the trench box, sloughing of compacted backfill into the voids space as the trench box is raised could result in some loss of lateral support for the embedded piping.

Groundwater will certainly need to be controlled during pipeline construction. We would recommend that groundwater be lowered to no less than 12 inches below the maximum excavation depth. Considering the stratified nature of the subsurface soils we would certainly recommend that the contractor retain a dewatering consultant to assist in developing an effective dewatering plan which would likely incorporate properly designed and constructed well points on both sides of the excavation.

Depending upon the ways and means of construction, the pipeline may occur in close proximity to existing structures or utilities. The contractor must therefore exercise due precautions in order to avoid any damage or deformation of flanking structures or utilities. In such instances, construction procedures should be incorporated that will minimize any significant vibration such

as vibratory installation and extraction of sheet piling or the use of heavy vibratory compaction equipment. In critical areas, backfill compaction should be conducted utilizing light hand-guided vibratory compaction equipment and thin lifts on the order of 6-inches or less in order to achieve uniform compaction.

LIMITATIONS

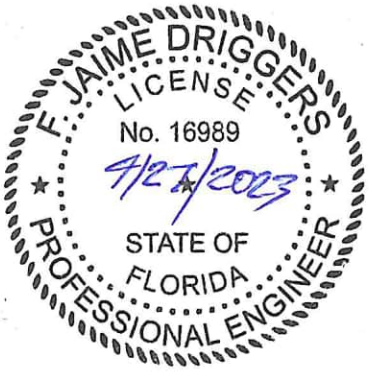
In general, the pattern of borings were relatively widely spaced and intended to provide general information to assist in the design of the planned facilities. It would certainly be recommended that a representative of the project geotechnical engineer by retained to monitor the construction and identify areas that may warrant special treatment or remediation. Appropriate compaction tests should also be performed as required by project specifications and in compliance with applicable City of Clearwater standards.

Our investigation may not have included development of all subsurface soils information that may be needed by the perspective contractor in the development of their construction ways and means. The contractor is certainly encouraged to conduct such additional investigation as may be deemed necessary to qualify their proposal.

DRIGGERS ENGINEERING SERVICES, INC. appreciates the opportunity to assist you on this project and we trust if you have any questions, you will not hesitate to contact the undersigned at your convenience.

Respectfully submitted,
DRIGGERS ENGINEERING SERVICES, INC.

F. Jaime Driggers, P.E.
President
FL Registration No. 16989



FJD\nja
FJD-REP\239057
Copies submitted: Email

APPENDIX

PLATES I-A – I-D - BORING LOCATION PLANS

PLATE II – SOIL BORING PROFILE

PLATE III – TEST BORING SUMMARY

STANDARD PENETRATION TEST BORING LOGS

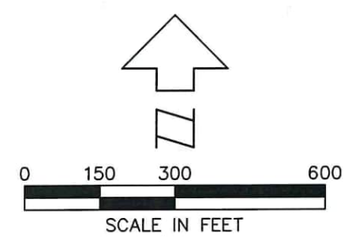
HAND AUGER BORING AND HAND CONE SOUNDING LOGS

SUMMARY OF LABORATORY TEST RESULTS

GRAINSIZE ANALYSES

METHOD OF TESTING

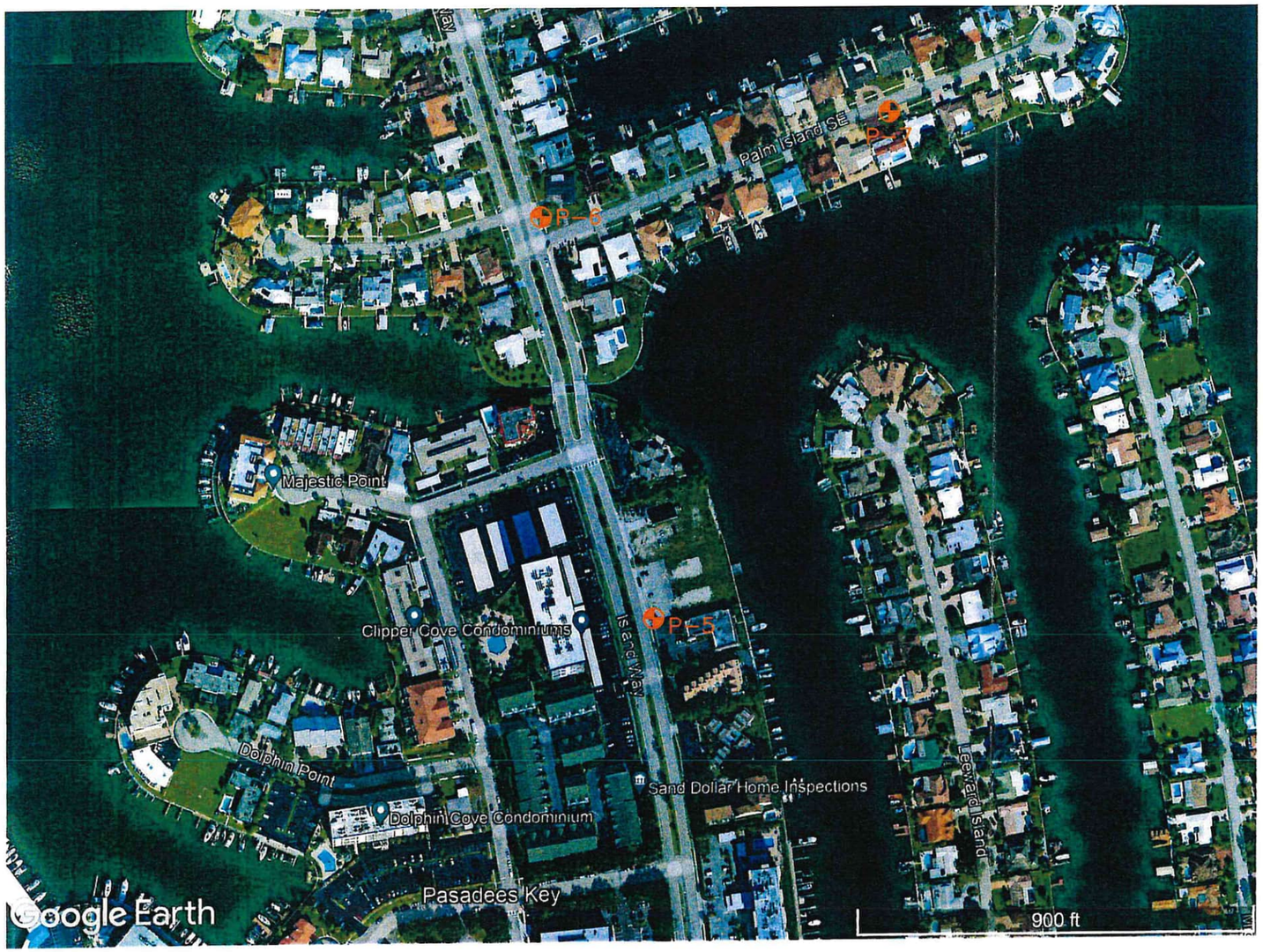
PLATES I-A – I-D - BORING LOCATION PLANS

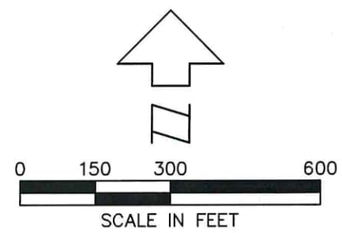


LEGEND:

STANDARD PENETRATION TEST BORING/ HAND CONE SOUNDING LOCATION

CAD / ENGINEER	SHEET TITLE	PROJECT NO.	DATE
R.D.B. / F.J.D.	BORING LOCATION PLAN	DES 239057	4/18/23
PREPARED BY	PROJECT NAME	CAD FILE NAME	SHEET NO.
DRIGGERS ENGINEERING SERVICES, INCORPORATED	WATER MAIN REPLACEMENT ISLAND ESTATES CLEARWATER, FLORIDA	A:\PLATE1\ 239057–P1A–CAD–IMPORT–PDF\ 239057–P1A–LOCATION–PLAN	PLATE I–A

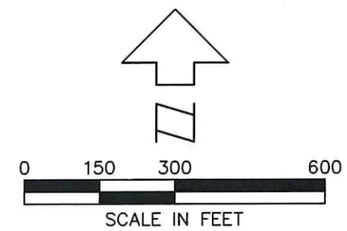




LEGEND:

STANDARD PENETRATION TEST BORING/ HAND CONE SOUNDING LOCATION

CAD / ENGINEER	SHEET TITLE	PROJECT NO.	DATE
R.D.B. / F.J.D.	BORING LOCATION PLAN	DES 239057	4/18/23
PREPARED BY	PROJECT NAME	CAD FILE NAME	SHEET NO.
desi DRIGGERS ENGINEERING SERVICES, INCORPORATED	WATER MAIN REPLACEMENT ISLAND ESTATES CLEARWATER, FLORIDA	A:\PLATE1\ 239057-P1B-CAD-IMPORT-PDF\ 239057-P1B-LOCATION-PLAN	PLATE I-B



LEGEND:

STANDARD PENETRATION TEST BORING/ HAND CONE SOUNDING LOCATION

CAD / ENGINEER	SHEET TITLE	PROJECT NO.	DATE
R.D.B. / F.J.D.	BORING LOCATION PLAN	DES 239057	4/18/23
PREPARED BY	PROJECT NAME	CAD FILE NAME	SHEET NO.
DRIGGERS ENGINEERING SERVICES, INCORPORATED	WATER MAIN REPLACEMENT ISLAND ESTATES CLEARWATER, FLORIDA	A:\PLATE1\ 239057-P1C-CAD-IMPORT-PDF\ 239057-P1C-LOCATION-PLAN	PLATE I-C

N

0 150 300 600

SCALE IN FEET

LEGEND:

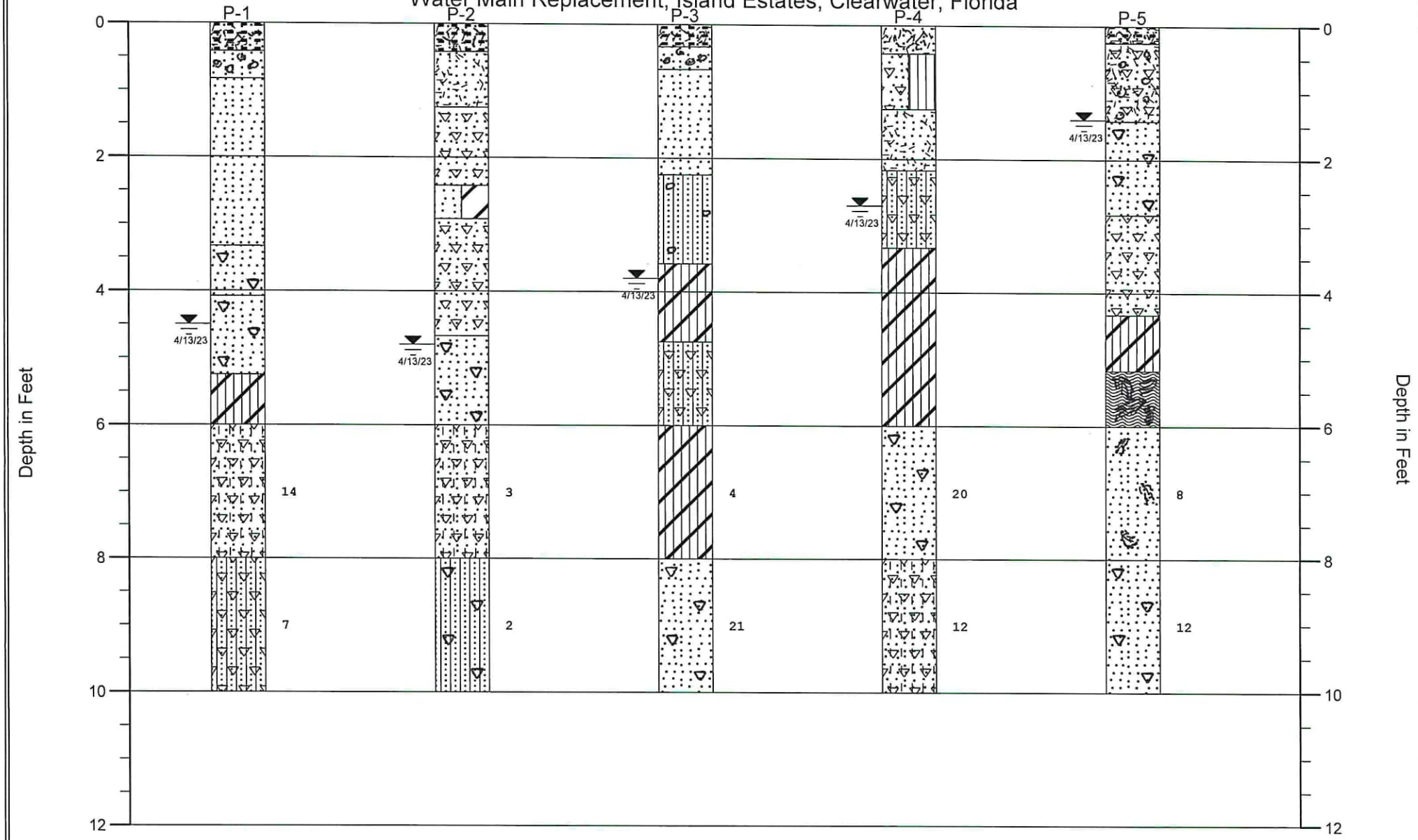
STANDARD PENETRATION TEST BORING/ HAND CONE SOUNDING LOCATION

CAD / ENGINEER	SHEET TITLE	PROJECT NO.	DATE
R.D.B. / F.J.D.	BORING LOCATION PLAN	DES 239057	4/18/23
PREPARED BY	PROJECT NAME	CAD FILE NAME	SHEET NO.
DRIGGERS ENGINEERING SERVICES, INCORPORATED	WATER MAIN REPLACEMENT ISLAND ESTATES CLEARWATER, FLORIDA	A:\PLATE1\ 239057-P1D-CAD-IMPORT-PDF\ 239057-P1D-LOCATION-PLAN	PLATE I-D

PLATE II – SOIL BORING PROFILE

SOIL BORING PROFILE

Water Main Replacement, Island Estates, Clearwater, Florida

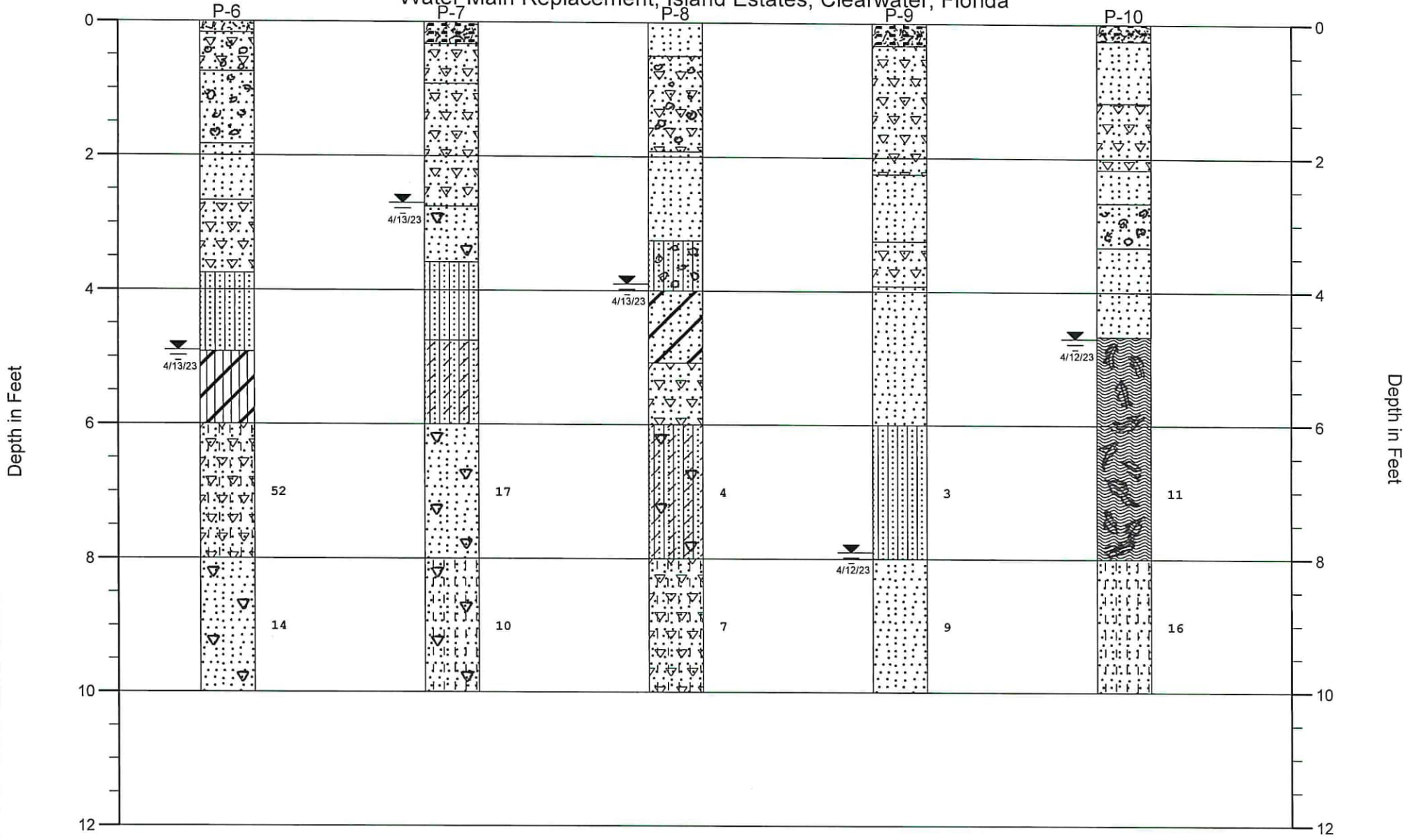


DRIGGERS ENGINEERING SERVICES, INC.

PLATE II – A

SOIL BORING PROFILE

Water Main Replacement, Island Estates, Clearwater, Florida



strata symbols

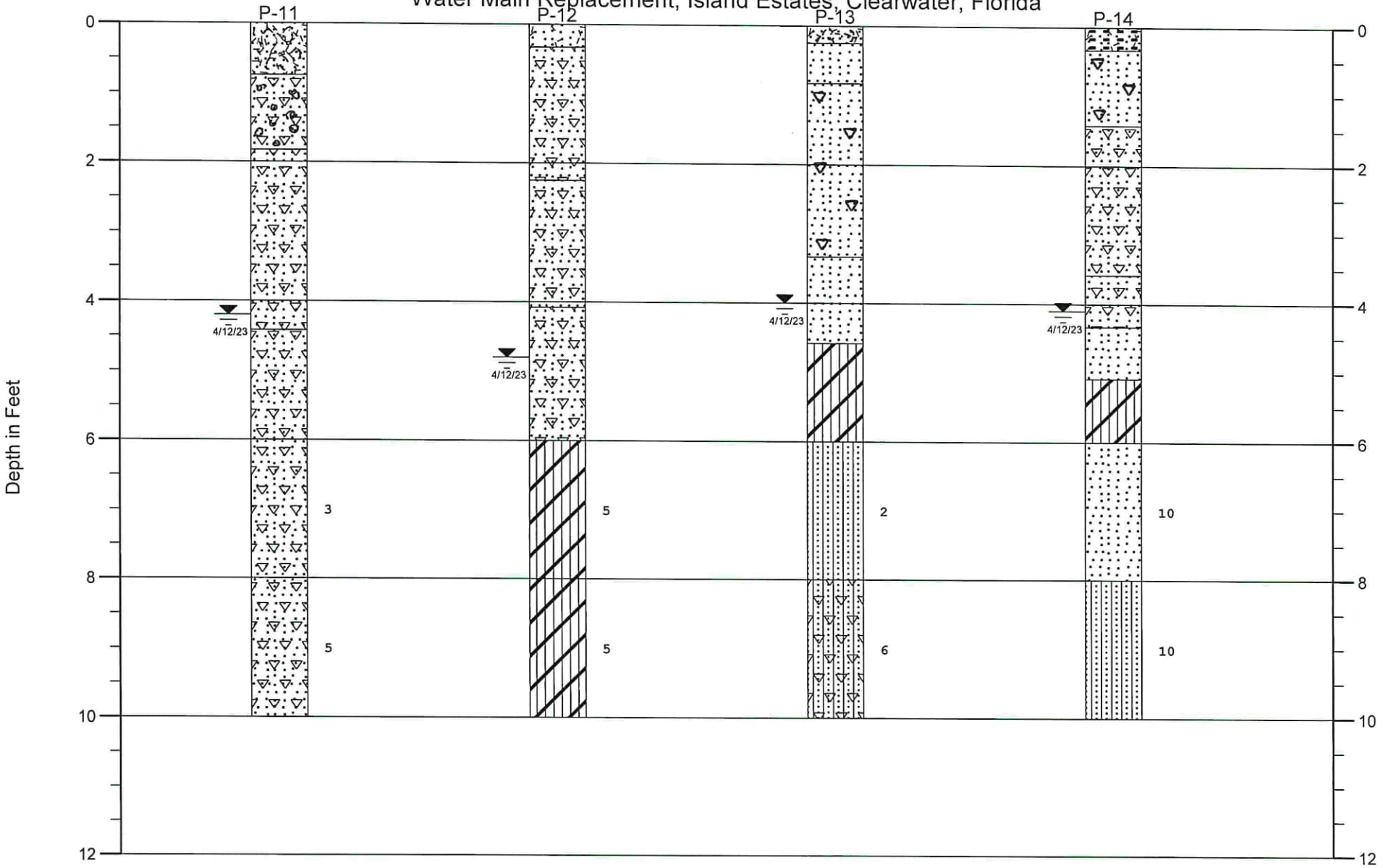
- Fine SAND with roots
- Fine SAND with shell
- Fine SAND
- Silty Fine SAND
- Silty CLAY
- Slightly silty Fine SAND with shell
- Fine SAND with organics and roots
- Silty, slightly clayey Fine SAND
- Slightly silty Fine SAND
- Sandy CLAY
- Fibrous Organic Matter (Peat)

DRIGGERS ENGINEERING SERVICES, INC.

PLATE II – B

SOIL BORING PROFILE

Water Main Replacement, Island Estates, Clearwater, Florida



strata symbols

- Fine SAND with roots
- Fine SAND with shell
- Silty CLAY
- Fine SAND
- Silty Fine SAND
- Silty Fine SAND with shell
- Fine SAND with organics and roots

DRIGGERS ENGINEERING SERVICES, INC.

PLATE II – C

PLATE III – TEST BORING SUMMARY

TEST BORING SUMMARY

Boring Location	Approx. Elevation (Ft.) (NAVD88)	Depth to Observed Water Table (Ft.)	Depth (Ft.) Soft Clay (C) Highly Organic (O)
P1	+5.1	4.5	5.2 – 6.0 (C)
P2	+3.5	4.8	-
P3	+4.5	3.8	3.5 – 5.8 ; 6.0 – 8.0 (C)
P4	+3.3	2.7	3.2 – 6.0 (C)
P5	+3.4	1.4	4.2 – 5.0 (C) ; 5.0 – 6.0 (O)
P6	+5.5	4.9	5.0 – 6.0 (C)
P7	Unknown	2.7	-
P8	Unknown	3.9	-
P9	+8.0	7.9	-
P10	+5.2	4.7	4.7 – 8.0 (O)
P11	+5.9	4.2	-
P12	+5.9	4.8	-
P13	+5.0	4.0	4.5 – 6.0 (C)
P14	+7.5	4.1	5.0 – 6.0 (C)

PLATE III

STANDARD PENETRATION TEST BORING LOGS

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-1**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-A **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 4.5' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP
			SURF. EL:		10 20 40 60 80
0			Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)		
			Dark brown Fine SAND with limestone fragments (SP) (A-3)		
			Light gray Fine SAND (SP) (A-3)		
5			Gray Fine SAND with rust colored veins and trace of shell (SP) (A-3)		
			Gray Fine SAND with trace of shell (SP) (A-3)		
			Dark gray silty CLAY (CH) (A-7-6)	4/5/9/9	
			Medium dense gray slightly silty Fine SAND with shell (SP-SM) (A-3)	2/3/4/5	
10			Loose dark gray silty Fine SAND with shell (SM) (A-2-4)		
15					
20					
25					
30					

Remarks GPS Location: 27° 58' 31.85" N 82° 49' 1.96" W

Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-2**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-A **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 4.8' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)		
			Tan and brown Fine SAND with roots (SP) (A-3)		
			Light tan Fine SAND with shell (SP) (A-3)		
			Light gray Fine SAND with pockets of orange CLAY (SP/CH) (A-3/A-7-6)		
5			Light tan Fine SAND with shell (SP) (A-3)		
			Gray Fine SAND with trace of shell (SP) (A-3)		
			Very loose gray slightly silty Fine SAND with shell (SP-SM) (A-3)	4/1/2/2	
			Very loose gray very silty Fine SAND with trace of shell (SM) (A-2-4)	2/1/1/3	
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 58' 36.87" N 82° 48' 58.45" W

Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-3**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-A **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 3.8' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)		
			Brown Fine SAND with limestone fragments (SP) (A-3)		
			Gray and brown Fine SAND (SP) (A-3)		
5			Dark gray silty Fine SAND with trace of limestone fragments (SM) (A-2-4)		
			Dark gray silty CLAY (CH) (A-7-6)		
			Dark gray silty Fine SAND with shell (SM) (A-2-4)	3/2/2/2	
			Soft gray silty CLAY (CH) (A-7-6)	8/12/9/12	
10			Medium dense gray Fine SAND with trace of shell (SP) (A-3)		
15					
20					
25					
30					

Remarks GPS Location: 27° 58' 37.63" N 82° 49' 2.92" W

Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-4**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-A **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 2.7' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP
			SURF. EL:		10 20 40 60 80
0			Dark brown Fine SAND with Root Mat (SP) (A-3)		
			Light gray and gray Fine SAND with shell and pockets of SILT (SP/MH) (A-3/A-4)		
			Gray Fine SAND with roots (SP) (A-3)		
			Light gray and gray silty Fine SAND with shell (SM) (A-2-4)		
5			Dark gray silty CLAY (CH) (A-7-6)		
			Medium dense gray Fine SAND with trace of shell (SP) (A-3)	4/7/13/11	
			Medium dense gray slightly silty Fine SAND with shell (SP-SM) (A-3)	7/8/4/7	
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 58' 43.27" N 82° 48' 58.66" W
Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO.** P-5

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-B **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 1.4' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown organic Fine SAND with Root Mat and shell (SP-SM/Pt) (A-8)		
			Gray and dark gray Fine SAND with roots, shell and limestone fragments (SP) (A-3)		
			Gray Fine SAND with trace of shell (SP) (A-3)		
5			Gray Fine SAND with shell (SP) (A-3)		
			Dark gray silty CLAY (CH) (A-7-6)		
			Dark brown Fibrous Organic Matter (Peat) (Pt) (A-8)	2/2/6/10	
			Loose dark gray Fine SAND with trace of dark brown Fibrous Organic Matter (SP) (A-3)	7/6/6/6	
10			Medium dense gray Fine SAND with trace of shell (SP) (A-3)		
15					
20					
25					
30					

Remarks GPS Location: 27° 58' 52.17" N 82° 49' 0.31" W
Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO.** P-6

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-B **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 4.9' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Gray Fine SAND with Root Mat and trace of shell (SP) (A-3)		
			Gray Fine SAND with shell and limestone fragments (SP) (A-3)		
			Light gray Fine SAND with limestone fragments (SP) (A-3)		
5			Light gray Fine SAND with trace of shell (SP) (A-3)		
			Light gray Fine SAND with shell (SP) (A-3)	4/20/32/27	
			Dark gray silty Fine SAND with trace of shell (SM) (A-2-4)	3/5/9/11	
10			Dark gray silty CLAY (CH) (A-7-6)		
			Very dense gray slightly silty Fine SAND with shell (SP-SM) (A-3)		
			Medium dense light gray Fine SAND with trace of shell (SP) (A-3)		
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 1.10" N 82° 49' 3.13" W

Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO.** P-7

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-B **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 2.7' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)		
			Brown Fine SAND with shell (SP) (A-3)		
			Gray Fine SAND with shell (SP) (A-3)		
			Light gray Fine SAND with trace of shell (SP) (A-3)		
5			Dark gray silty Fine SAND (SM) (A-2-4)		
			Dark gray silty, slightly clayey Fine SAND (SM) (A-2-4)	4/8/9/21	
			Medium dense gray Fine SAND with trace of shell (SP) (A-3)	7/5/5/6	
10			Loose gray slightly silty Fine SAND with trace of shell (SP-SM) (A-3)		
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 3.31" N 82° 48' 54.27" W
Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-8**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-C **Foreman** R.K.

Completion Depth 10.0' **Date** 4/13/23 **Depth To Water** 3.9' **Time** _____ **Date** 4/13/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION SURF. EL:	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP 10 20 40 60 80
0			Dark brown Fine SAND (SP) (A-3)		
			Light gray Fine SAND with shell and limestone fragments (SP) (A-3)		
			Light gray Fine SAND (SP) (A-3)		
			Gray silty Fine SAND with limestone fragments (SM) (A-2-4)		
5			Green sandy CLAY (CH) (A-7-6)		
			Gray Fine SAND with shell and limestone fragments (SP) (A-3)	2/2/2/2	
			Very loose dark gray silty, slightly clayey Fine SAND with trace of shell (SM) (A-2-4)	3/4/3/3	
10			Loose dark gray slightly silty Fine SAND with shell (SP-SM) (A-3)		
			Note: Boring P-8 was offset 63.0' East due to freshly-laid sod at original location.		
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 8.31" N 82° 48' 56.45" W

Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-9**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-C **Foreman** R.K.

Completion Depth 10.0' **Date** 4/12/23 **Depth To Water** 7.9' **Time** _____ **Date** 4/12/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)		
			Tan Fine SAND with shell (SP) (A-3)		
			Tan Fine SAND (SP) (A-3)		
			Light brown Fine SAND with shell (SP) (A-3)		
5			Light gray Fine SAND (SP) (A-3)		
			Very loose dark gray silty Fine SAND (SM) (A-2-4)	3/2/1/6	
			Loose gray Fine SAND (SP) (A-3)	5/4/5/3	
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 11.00" N 82° 49' 8.00" W
Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-10**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-C **Foreman** R.K.

Completion Depth 10.0' **Date** 4/12/23 **Depth To Water** 4.7' **Time** _____ **Date** 4/12/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)		
			Dark brown Fine SAND (SP) (A-3)		
			Gray Fine SAND with shell (SP) (A-3)		
			Light gray Fine SAND (SP) (A-3)		
5			Light gray Fine SAND with limestone fragments (SP) (A-3)		
			Gray Fine SAND (SP) (A-3)		
			Stiff dark brown Fibrous Organic Matter (Peat) (Pt) (A-8)	7/10/1/1	
			Medium dense grayish-brown slightly silty Fine SAND (SP-SM) (A-3)	12/11/5/3	
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 16.04" N 82° 49' 10.60" W

Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-11**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-C **Foreman** R.K.

Completion Depth 10.0' **Date** 4/12/23 **Depth To Water** 4.2' **Time** _____ **Date** 4/12/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown Fine SAND with Root Mat (SP) (A-3)		
			Tan Fine SAND with shell and limestone fragments (SP) (A-3)		
			Light brown Fine SAND with shell (SP) (A-3)		
5			Brown and gray Fine SAND with shell (SP) (A-3)		
			Very loose to loose gray Fine SAND with shell (SP) (A-3)	2/2/1/1	
				5/2/3/4	
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 23.68" N 82° 49' 12.59" W
Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO.** P-12

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-D **Foreman** R.K.

Completion Depth 10.0' **Date** 4/12/23 **Depth To Water** 4.8' **Time** _____ **Date** 4/12/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Brown Fine SAND with roots (SP) (A-3)		
			Gray Fine SAND with shell (SP) (A-3)		
			Tan Fine SAND with shell (SP) (A-3)		
5			Gray Fine SAND with shell (SP) (A-3)		
			Firm dark gray silty CLAY with trace of light gray Fine SAND (CH) (A-7-6)	3/3/2/2	
				2/2/3/4	
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 26.29" N 82° 49' 13.11" W

Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-13**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-D **Foreman** R.K.

Completion Depth 10.0' **Date** 4/12/23 **Depth To Water** 4.0' **Time** _____ **Date** 4/12/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Brown and gray Fine SAND with Root Mat (SP) (A-3)		
			Dark brown Fine SAND (SP) (A-3)		
			Tan Fine SAND with trace of shell (SP) (A-3)		
			Gray Fine SAND with trace of shell (SP) (A-3)		
5			Dark gray silty CLAY (CH) (A-7-6)		
			Very loose light gray and gray very silty Fine SAND (SM) (A-2-4)	1/1/1/1	
			Loose gray silty Fine SAND with shell (SM) (A-2-4)	2/2/4/5	
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 34.82" N 82° 49' 13.52" W
Borehole Grouted **Casing Length** _____

DRIGGERS ENGINEERING SERVICES INCORPORATED

Project No. DES 239057 **BORING NO. P-14**

Project Water Main Replacement, Island Estates, Clearwater, Florida

Location See Plate I-D **Foreman** R.K.

Completion Depth 10.0' **Date** 4/12/23 **Depth To Water** 4.1' **Time** _____ **Date** 4/12/23

DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP (10 20 40 60 80)
			SURF. EL:		
0			Dark brown organic Fine SAND with roots (SP-SM/Pt) (A-3)		
			Tan Fine SAND with trace of shell (SP) (A-3)		
			Tan Fine SAND with shell (SP) (A-3)		
			Gray Fine SAND with shell (SP) (A-3)		
5			Gray Fine SAND (SP) (A-3)		
			Dark gray silty CLAY (CH) (A-7-6)		
			Loose gray Fine SAND (SP) (A-3)	1/3/7/6	●
			Loose dark brown silty Fine SAND (SM) (A-2-4)	4/4/6/11	●
10					
15					
20					
25					
30					

Remarks GPS Location: 27° 59' 46.50" N 82° 49' 12.34" W
Borehole Grouted **Casing Length** _____

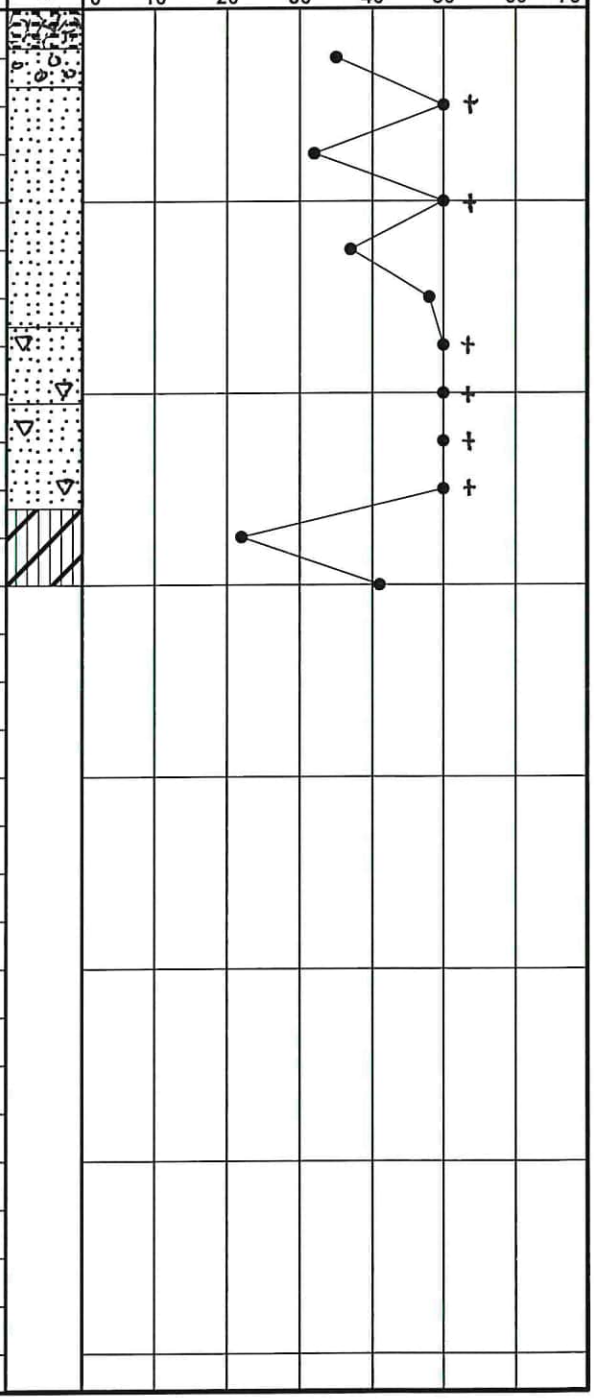
HAND AUGER BORING AND HAND CONE SOUNDING LOGS

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc.
WATER TABLE: 4.5'	**DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23
COMPLETION DEPTH: 6.0'	
LOCATION: See Plate I-A	**TEST NUMBER:** P-1

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	HAND CONE TIP RESISTANCE (TSF) 0 10 20 30 40 50 60 70
	Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-3)	0		
	Dark brown Fine SAND with limestone fragments (SP) (A-3)			
	Light gray Fine SAND (SP) (A-3)	2		
	Gray Fine SAND with rust colored veins and trace of shell (SP) (A-3)	4		
	Gray Fine SAND with trace of shell (SP) (A-3)			
	Dark gray silty CLAY (CH) (A-7-6)	6		
	GPS Location: 27° 58' 31.85" N 82° 49' 1.96" W	8		
		10		
		12		
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14		



DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc.
WATER TABLE: 4.8'	**DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23
COMPLETION DEPTH: 6.0'	
LOCATION: See Plate I-A	**TEST NUMBER:** P-2

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	HAND CONE TIP RESISTANCE (TSF) 0 10 20 30 40 50 60 70
	Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)	0		
	Tan and brown Fine SAND with roots (SP) (A-3)			
	Light tan Fine SAND with shell (SP) (A-3)	2		
	Light gray Fine SAND with pockets of orange CLAY (SP/CH) (A-3/A-7-6)			
	Light tan Fine SAND with shell (SP) (A-3)	4		
	Gray Fine SAND with trace of shell (SP) (A-3)			
		6		
	GPS Location: 27° 58' 36.87" N 82° 48' 58.45" W			
		8		
		10		
		12		
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc.
WATER TABLE: 3.8'	**DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23
COMPLETION DEPTH: 6.0'	
LOCATION: See Plate I-A	**TEST NUMBER:** P-3

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	HAND CONE TIP RESISTANCE (TSF)
	Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)	0		0 10 20 30 40 50 60 70
	Brown Fine SAND with limestone fragments (SP) (A-3)			
	Gray and brown Fine SAND (SP) (A-3)	2		
	Dark gray silty Fine SAND with trace of limestone fragments (SM) (A-2-4)			
	Dark gray silty CLAY (CH) (A-7-6)	4		
	Dark gray silty Fine SAND with shell (SM) (A-2-4)			
		6		
	GPS Location: 27° 58' 37.63" N 82° 49' 2.92" W	8		
		10		
		12		
	LEGEND: ● + Denotes Penetration Resistance in excess of 50 TSF	14		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc. **WATER TABLE:** 2.7' — **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23 — **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-A	**TEST NUMBER:** P-4

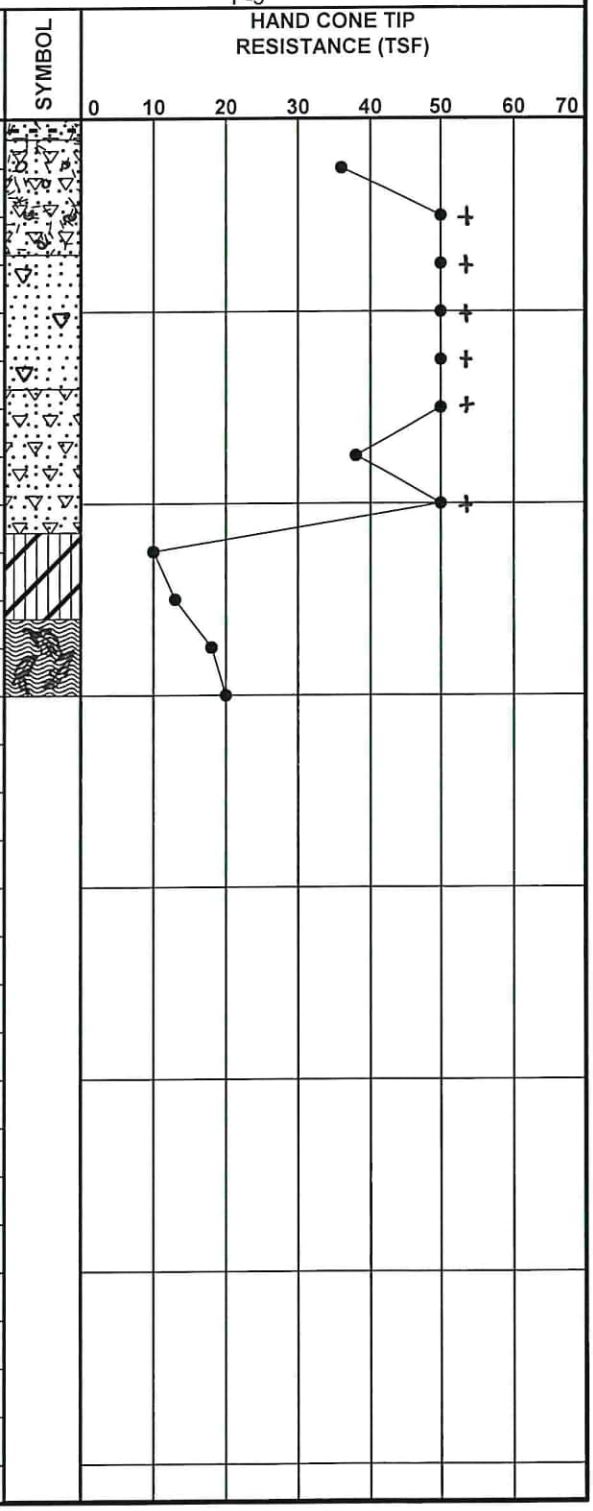
ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	HAND CONE TIP RESISTANCE (TSF)
	Dark brown Fine SAND with Root Mat (SP) (A-3)	0		0 10 20 30 40 50 60 70
	Light gray and gray Fine SAND with shell and pockets of SILT (SP/MH) (A-3/A-4)			
	Gray Fine SAND with roots (SP) (A-3)	2		
	Light gray and gray silty Fine SAND with shell (SM) (A-2-4)			
	Dark gray silty CLAY (CH) (A-7-6)	4		
		6		
	GPS Location: 27° 58' 43.27" N 82° 48' 58.66" W	8		
		10		
		12		
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc. **WATER TABLE:** 1.4' **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23 **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B	**TEST NUMBER:** P-5

ELEV. (FT)	DESCRIPTION	DEPTH (FT)
	Dark brown organic Fine SAND with roots and shell (SP-SM/Pt) (A-8)	0
	Gray and dark gray Fine SAND with roots, shell and limestone fragments (SP) (A-3)	
	Gray Fine SAND with trace of shell (SP) (A-3)	2
	Gray Fine SAND with shell (SP) (A-3)	
	Dark gray silty CLAY (CH) (A-7-6)	4
	Dark brown Fibrous Organic Matter (Peat) (Pt) (A-8)	6
	GPS Location: 27° 58' 52.17" N 82° 49' 0.31" W	8
		10
		12
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14



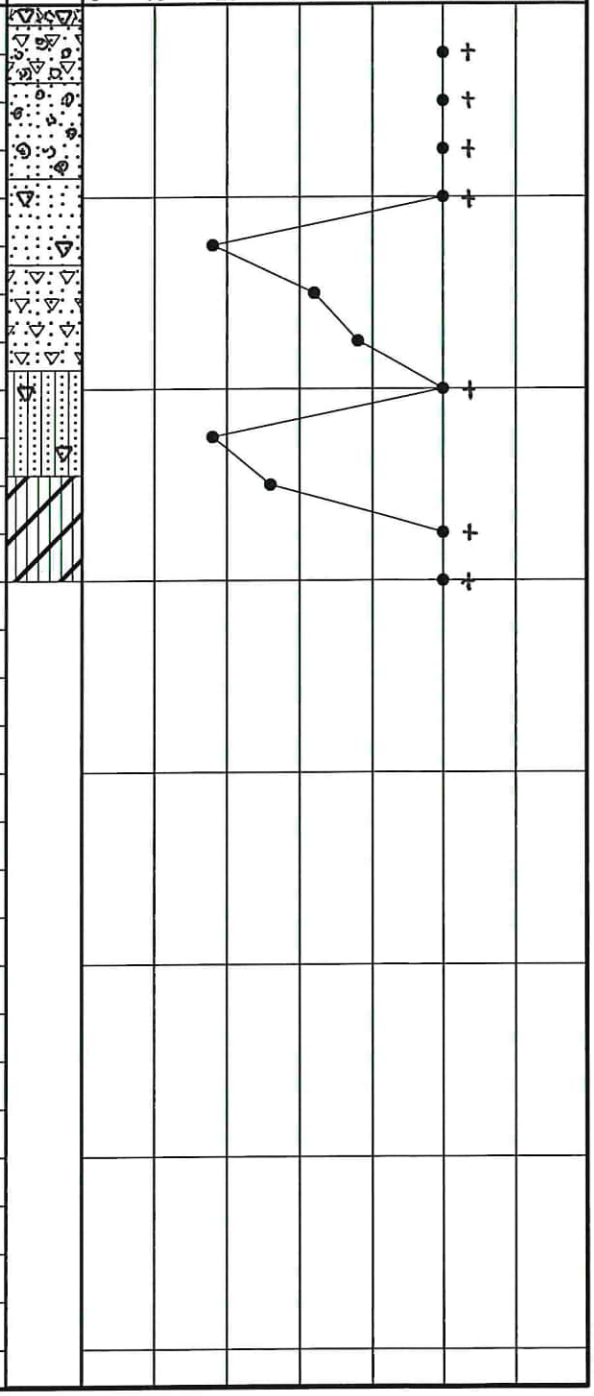
DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc. **WATER TABLE:** 4.9' **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23 **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-B	**TEST NUMBER:** P-6

ELEV. (FT)	DESCRIPTION	DEPTH (FT)
	Gray Fine SAND with Root Mat and trace of shell (SP) (A-3)	0
	Gray Fine SAND with shell and limestone fragments (SP) (A-3)	
	Light gray Fine SAND with limestone fragments (SP) (A-3)	2
	Light gray Fine SAND with trace of shell (SP) (A-3)	
	Light gray Fine SAND with shell (SP) (A-3)	
	Dark gray silty Fine SAND with trace of shell (SM) (A-2-4)	4
	Dark gray silty CLAY (CH) (A-7-6)	
		6
	GPS Location: 27° 59' 1.10" N 82° 49' 3.13" W	
		8
		10
		12
	LEGEND: ● + Denotes Penetration Resistance in excess of 50 TSF	14

SYMBOL

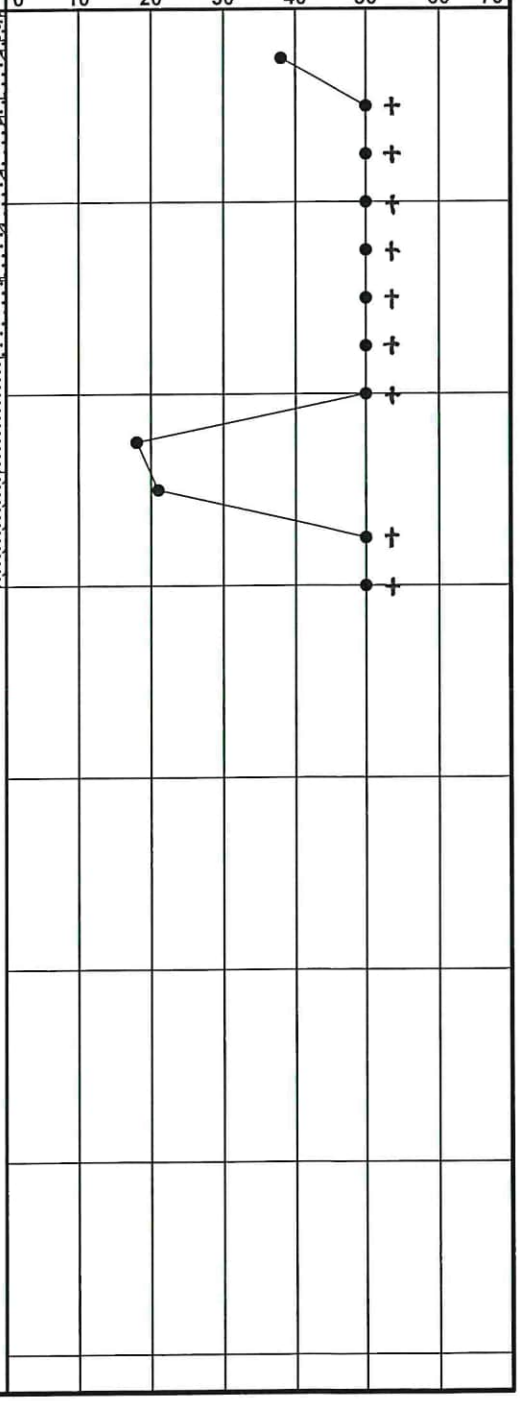


DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc.
WATER TABLE: 2.7'	**DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23
COMPLETION DEPTH: 6.0'	
LOCATION: See Plate I-B	**TEST NUMBER:** P-7

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL
	Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)	0	
	Brown Fine SAND with shell (SP) (A-3)		
	Gray Fine SAND with shell (SP) (A-3)	2	
	Light gray Fine SAND with trace of shell (SP) (A-3)		
	Dark gray silty Fine SAND (SM) (A-2-4)	4	
	Dark gray silty, slightly clayey Fine SAND (SM) (A-2-4)	6	
	GPS Location: 27° 59' 3.31" N 82° 48' 54.27" W	8	
		10	
		12	
	LEGEND: ● + Denotes Penetration Resistance in excess of 50 TSF	14	

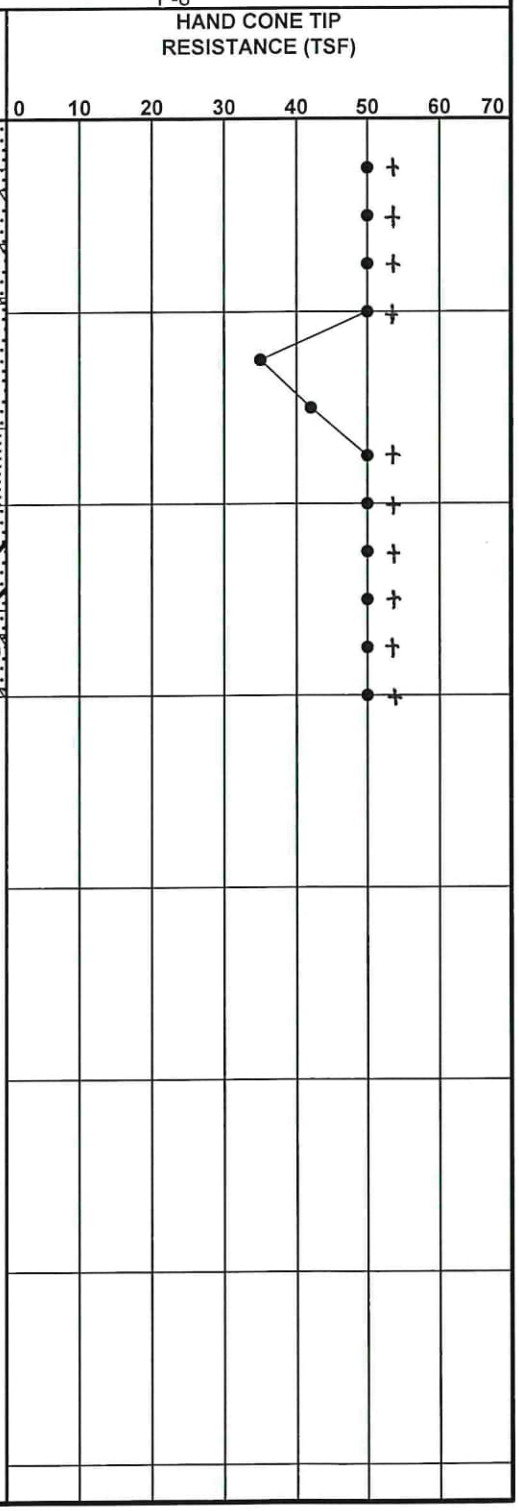


DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc.
WATER TABLE: 3.9'	**DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/13/23
COMPLETION DEPTH: 6.0'	
LOCATION: See Plate I-C	**TEST NUMBER:** P-8

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL
	Dark brown Fine SAND (SP) (A-3)	0	
	Light gray Fine SAND with shell and limestone fragments (SP) (A-3)		
	Light gray Fine SAND (SP) (A-3)	2	
	Gray silty Fine SAND with limestone fragments (SM) (A-2-4)	4	
	Green sandy CLAY (CH) (A-7-6)		
	Gray Fine SAND with shell and limestone fragments (SP) (A-3)	6	
	GPS Location: 27° 59' 8.31" N 82° 48' 56.45" W Note: Boring P-8 was offset 63.0' East due to freshly-laid sod at original location.	8	
		10	
		12	
	LEGEND: ● + Denotes Penetration Resistance in excess of 50 TSF	14	



DRIGGERS ENGINEERING SERVICES INCORPORATED

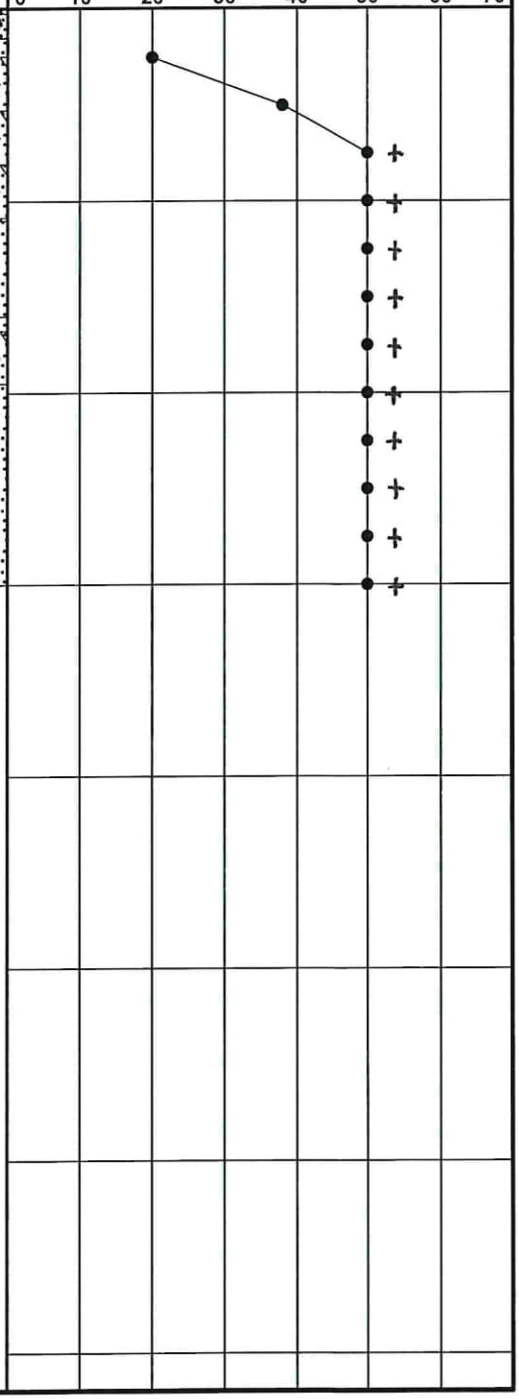
HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc. **WATER TABLE:** See "Note" **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/12/23 **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-C	**TEST NUMBER:** P-9

ELEV. (FT)	DESCRIPTION	DEPTH (FT)
	Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)	0
	Tan Fine SAND with shell (SP) (A-3)	
		2
	Tan Fine SAND (SP) (A-3)	
	Light brown Fine SAND with shell (SP) (A-3)	
	Light gray Fine SAND (SP) (A-3)	4
		6
	GPS Location: 27° 59' 11.00" N 82° 49' 8.00" W Note: Water Table not encountered within depth of 6.0'.	8
		10
		12
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14

SYMBOL

HAND CONE TIP RESISTANCE (TSF)



DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc.
WATER TABLE: 4.7'	**DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/12/23
	COMPLETION DEPTH: 6.0'
LOCATION: See Plate I-C	**TEST NUMBER:** P-10

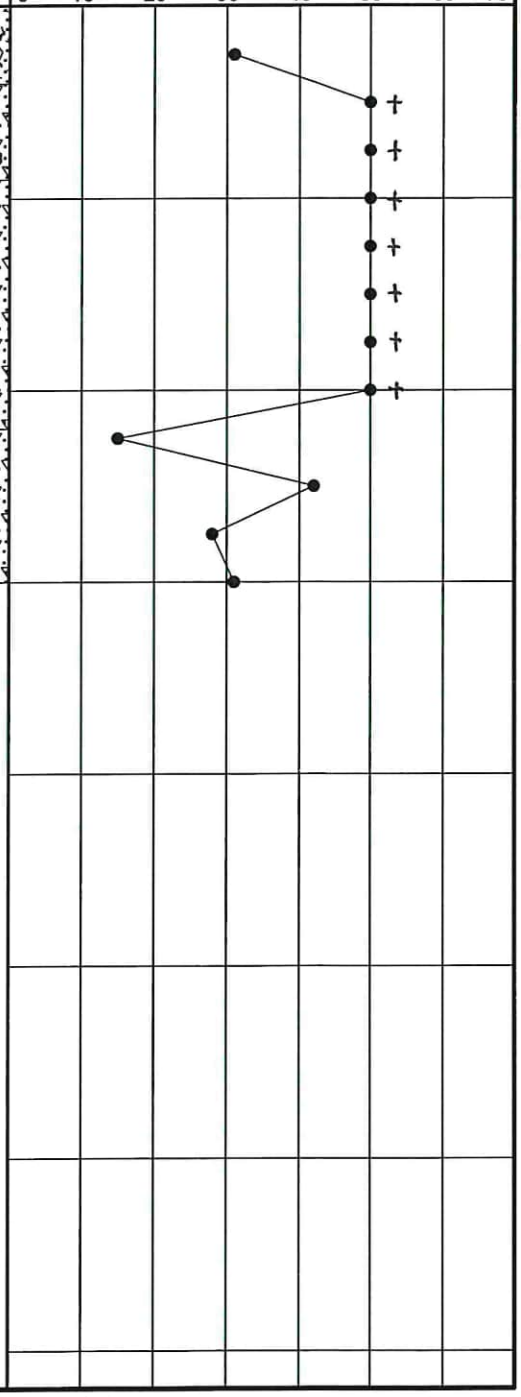
ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL	HAND CONE TIP RESISTANCE (TSF) 0 10 20 30 40 50 60 70
	Dark brown organic Fine SAND with Root Mat (SP-SM/Pt) (A-8)	0		
	Dark brown Fine SAND (SP) (A-3)			
	Gray Fine SAND with shell (SP) (A-3)	2		
	Light gray Fine SAND (SP) (A-3)			
	Light gray Fine SAND with limestone fragments (SP) (A-3)			
	Gray Fine SAND (SP) (A-3)	4		
	Dark brown Fibrous Organic Matter (Peat) (Pt) (A-8)			
		6		
	GPS Location: 27° 59' 16.04" N 82° 49' 10.60" W	8		
		10		
		12		
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14		

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc. **WATER TABLE:** 4.2' **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/12/23 **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-C	**TEST NUMBER:** P-11

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL
	Dark brown Fine SAND with Root Mat (SP) (A-3)	0	
	Tan Fine SAND with shell and limestone fragments (SP) (A-3)		
	Light brown Fine SAND with shell (SP) (A-3)	2	
		4	
	Brown and gray Fine SAND with shell (SP) (A-3)		
		6	
	GPS Location: 27° 59' 23.68" N 82° 49' 12.59" W	8	
		10	
		12	
	LEGEND: • + Denotes Penetration Resistance in excess of 50 TSF	14	

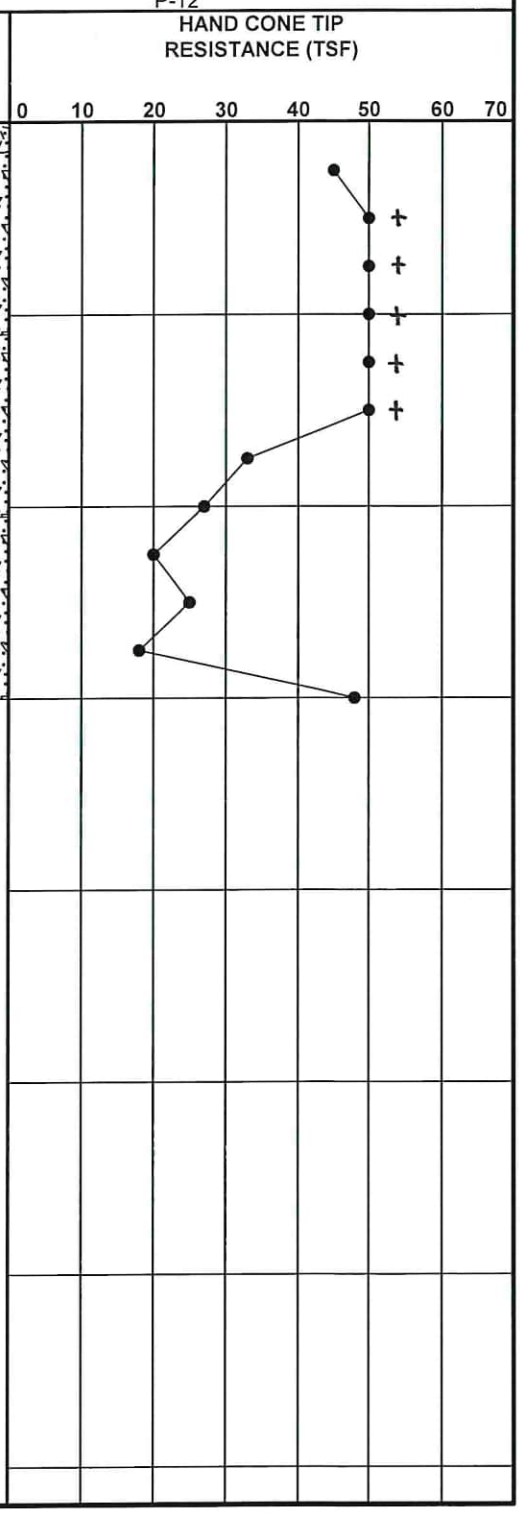


DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc. **WATER TABLE:** 4.8' **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/12/23 **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-D	**TEST NUMBER:** P-12

ELEV. (FT)	DESCRIPTION	DEPTH (FT)	SYMBOL
	Brown Fine SAND with roots (SP) (A-3)	0	
	Gray Fine SAND with shell (SP) (A-3)		
		2	
	Tan Fine SAND with shell (SP) (A-3)		
		4	
	Gray Fine SAND with shell (SP) (A-3)		
		6	
	GPS Location: 27° 59' 26.29" N 82° 49' 13.11" W	8	
		10	
		12	
	LEGEND: ● + Denotes Penetration Resistance in excess of 50 TSF	14	



DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

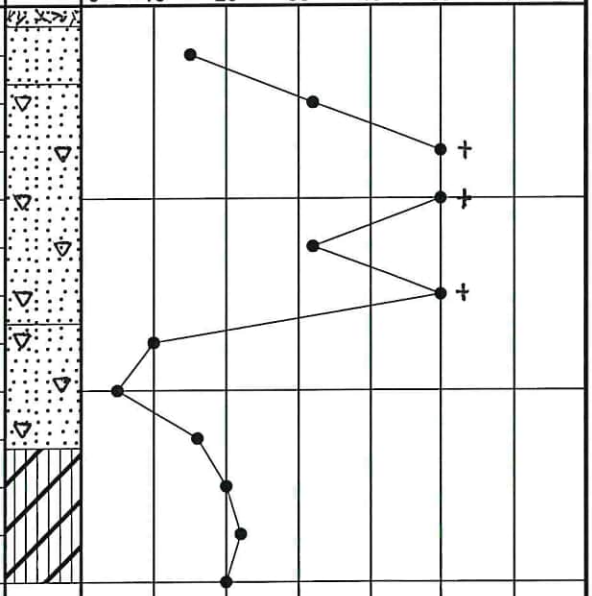
PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc. **WATER TABLE:** 4.0' **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/12/23 **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-D	**TEST NUMBER:** P-13

ELEV. (FT)	DESCRIPTION	DEPTH (FT)
	Brown and gray Fine SAND with Root Mat (SP) (A-3)	0
	Dark brown Fine SAND (SP) (A-3)	
	Tan Fine SAND with trace of shell (SP) (A-3)	2
	Gray Fine SAND with trace of shell (SP) (A-3)	4
	Dark gray silty CLAY (CH) (A-7-6)	6
	GPS Location: 27° 59' 34.82" N 82° 49' 13.52" W	8
		10
		12
		14

SYMBOL

HAND CONE TIP RESISTANCE (TSF)

0 10 20 30 40 50 60 70



LEGEND:

● + Denotes Penetration Resistance in excess of 50 TSF

DRIGGERS ENGINEERING SERVICES INCORPORATED

HAND AUGER BORING/HAND CONE SOUNDING LOG

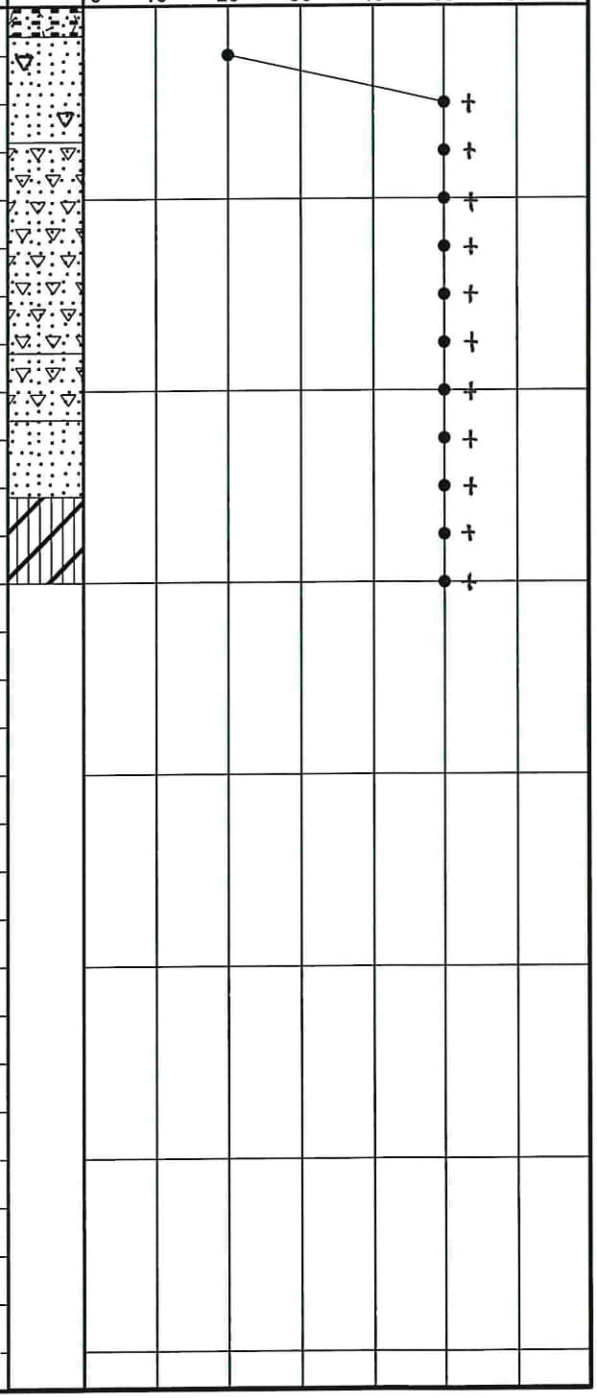
PROJECT: Water Main Replacement Island Estates Clearwater, Florida Project No.: DES 239057	**CLIENT:** CHA Consulting Services, Inc.
	WATER TABLE: 4.1' — **DATE:** 4/12/23
TECHNICIAN: R.K./B.C.	**DATE:** 4/12/23 — **COMPLETION DEPTH:** 6.0'
LOCATION: See Plate I-D	**TEST NUMBER:** P-14

ELEV. (FT)	DESCRIPTION	DEPTH (FT)
	Dark brown organic Fine SAND with roots (SP-SM/Pt) (A-8)	0
	Tan Fine SAND with trace of shell (SP) (A-3)	
	Tan Fine SAND with shell (SP) (A-3)	2
	Gray Fine SAND with shell (SP) (A-3)	4
	Gray Fine SAND (SP) (A-3)	
	Dark gray silty CLAY (CH) (A-7-6)	6
	GPS Location: 27° 59' 46.50" N 82° 49' 12.34" W	8
		10
		12
	LEGEND: ● + Denotes Penetration Resistance in excess of 50 TSF	14

SYMBOL

HAND CONE TIP RESISTANCE (TSF)

0 10 20 30 40 50 60 70



SUMMARY OF LABORATORY TEST RESULTS

SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	DEPTH (ft)	DESCRIPTION	W %	Y_d (pcf)	G_s	ATTERBERG LIMITS			P.P. (tsf)	U.C.	CON.	G.S.	ORG. (%)	pH	Cl. (ppm)	SO_4 (ppm)	RES. (ohm-cm)
						LL	PL	PI									
P-1	6.0-8.0	Gray slightly silty Fine SAND with shell										*					
P-3	3.6-4.8	Dark gray silty CLAY	80.8			121	52	69									
P-4	3.3-6.0	Dark gray silty CLAY	102.0			164	131	33				** 51.0					
P-5	5.2-6.0	Dark brown Fibrous Organic Matter (Peat)											11.6				
P-6	6.0-8.0	Gray slightly silty Fine SAND with shell										*					
P-7	4.8-6.0	Dark gray silty, slightly clayey Fine SAND				NP	NP					** 14.0					
P-8	8.0-10.0	Dark gray slightly silty Fine SAND with shell				NP	NP					*					
P-9	6.0-8.0	Dark gray silty Fine SAND				38	29	9				** 22.7					
P-10	4.7-6.0	Dark brown Fibrous Organic Matter (Peat)											42.5				
P-10	6.0-8.0	Dark brown Fibrous Organic Matter (Peat)											34.2				
P-11	4.4-5.2	Brown and gray Fine SAND with shell										*					
P-11	6.0-8.0	Dark brown Fibrous Organic Matter (Peat)											34.2				
P-12	6.0-8.0	Dark gray silty CLAY	54.8			97	47	50				** 38.2					
P-13	6.0-8.0	Gray very silty Fine SAND				39	26	13				*					
P-14	8.0-10.0	Dark brown silty Fine SAND											0.1				

W % = Water Content
Y_d (pcf) = Dry Density
G_S = Specific Gravity
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
P.P. (tsf) = Pocket Penetrometer
U.C. = Unconfined Compression

Con. = Consolidation Test
G.S. (+1) = Grainsize Analysis (Hydrometer)
ORG. (%) = Organic Content
Cl. (ppm) = Total Chloride
SO_4 (ppm) = Total Sulfate
RES. (ohm-cm) = Lab Resistivity
* = See Test Curves
** = Percent Passing No. 200 Sieve

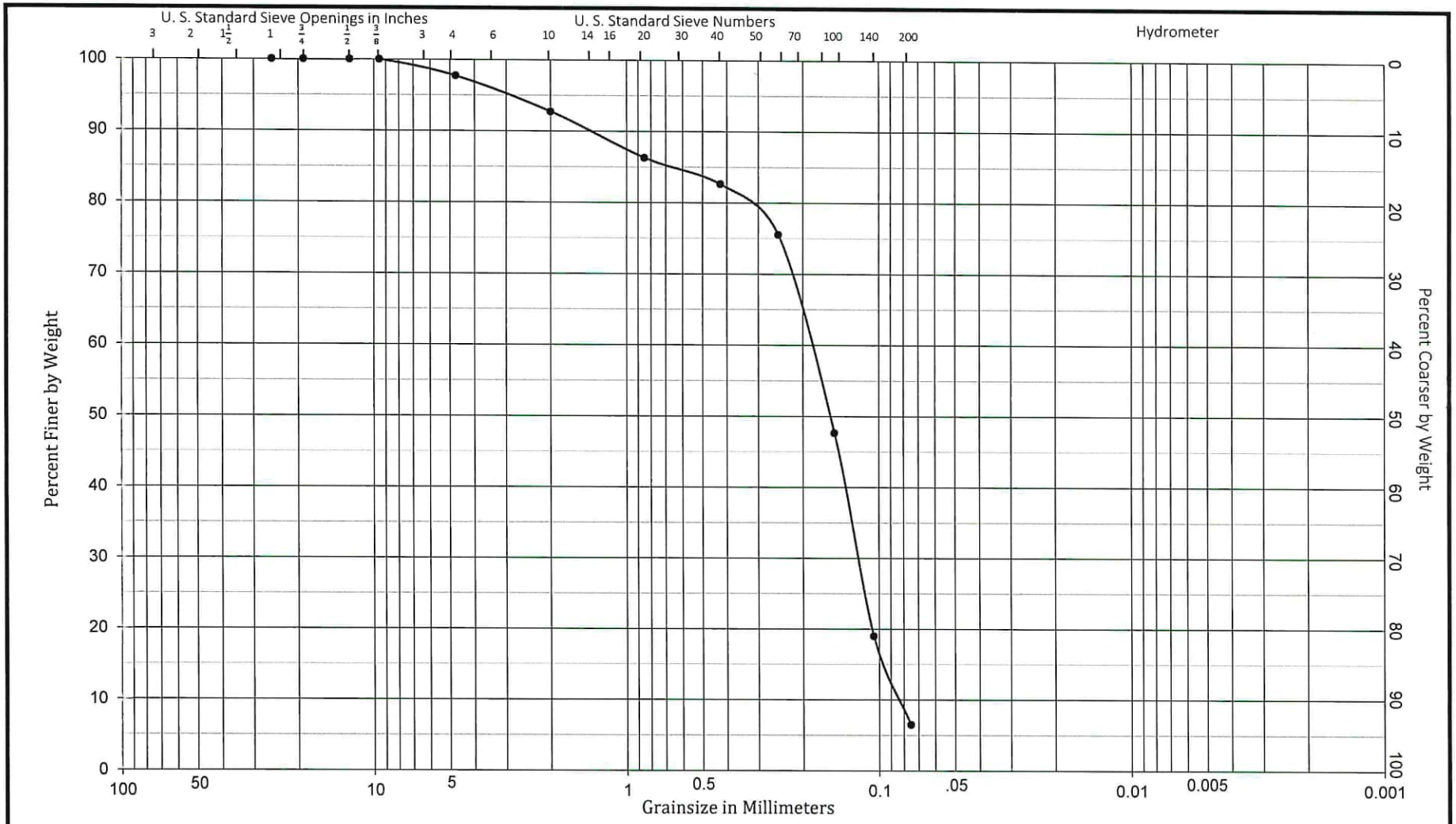
CLIENT: CHA Consulting Services, Inc.

PROJECT: Water Main Replacement, Island Estates, Clearwater, Florida

FILE: DES 239057

GRAINSIZE ANALYSES

DRIGGERS ENGINEERING SERVICES, INC.



	GRAVEL	SAND			SILT or CLAY
		Coarse	Medium	Fine	

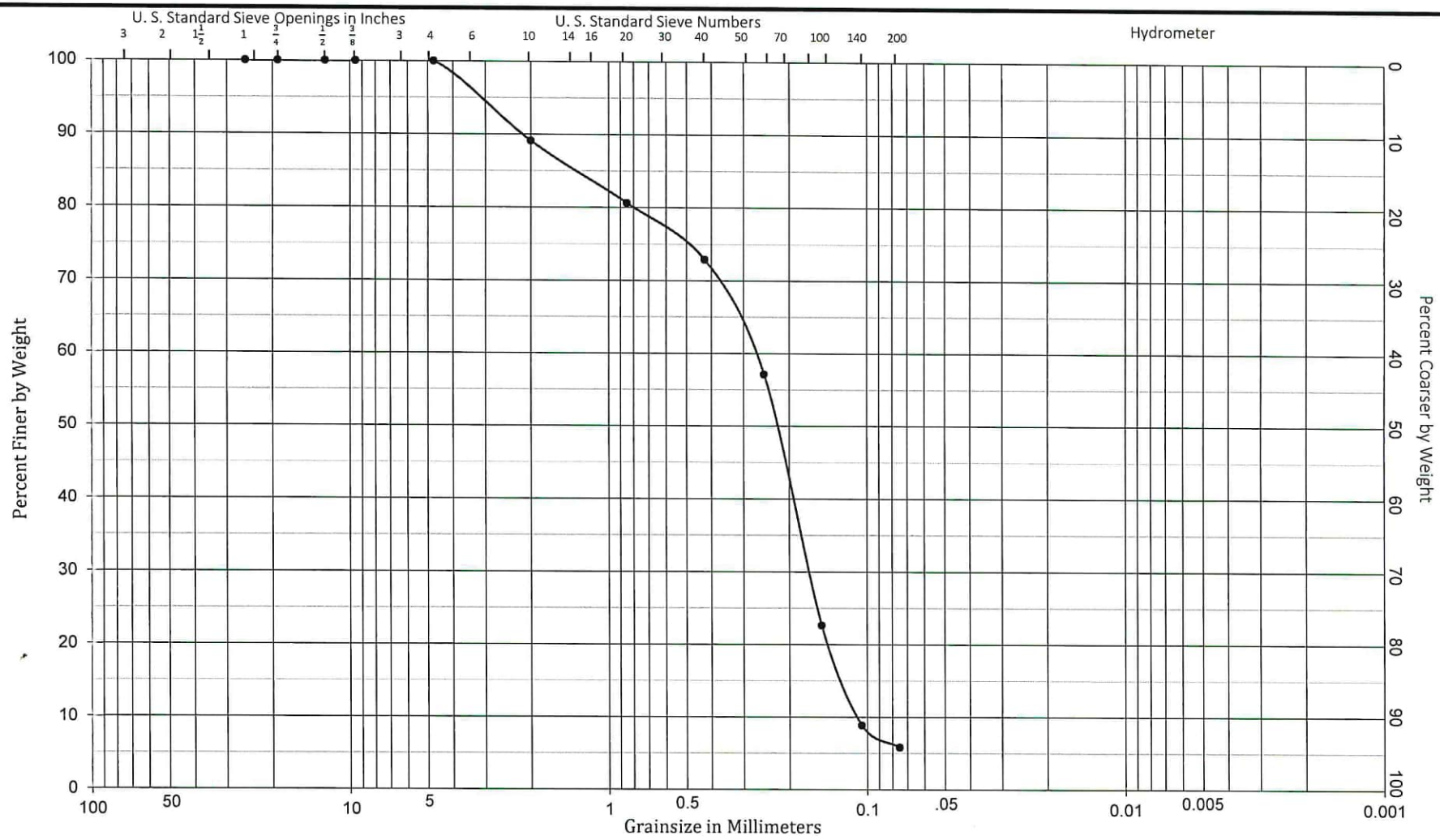
Number	Depth	Moisture	L.L.	P.L.	P.I.	Classification
P-1	6.0'-8.0'					Gray slightly silty Fine SAND with shell

CLIENT: CHA Consulting Services, Inc.

PROJECT: Water Main Replacement, Island Estates

FILE: DES 239057

DRIGGERS ENGINEERING SERVICES, INC.



GRAVEL	SAND			SILT or CLAY
	Coarse	Medium	Fine	

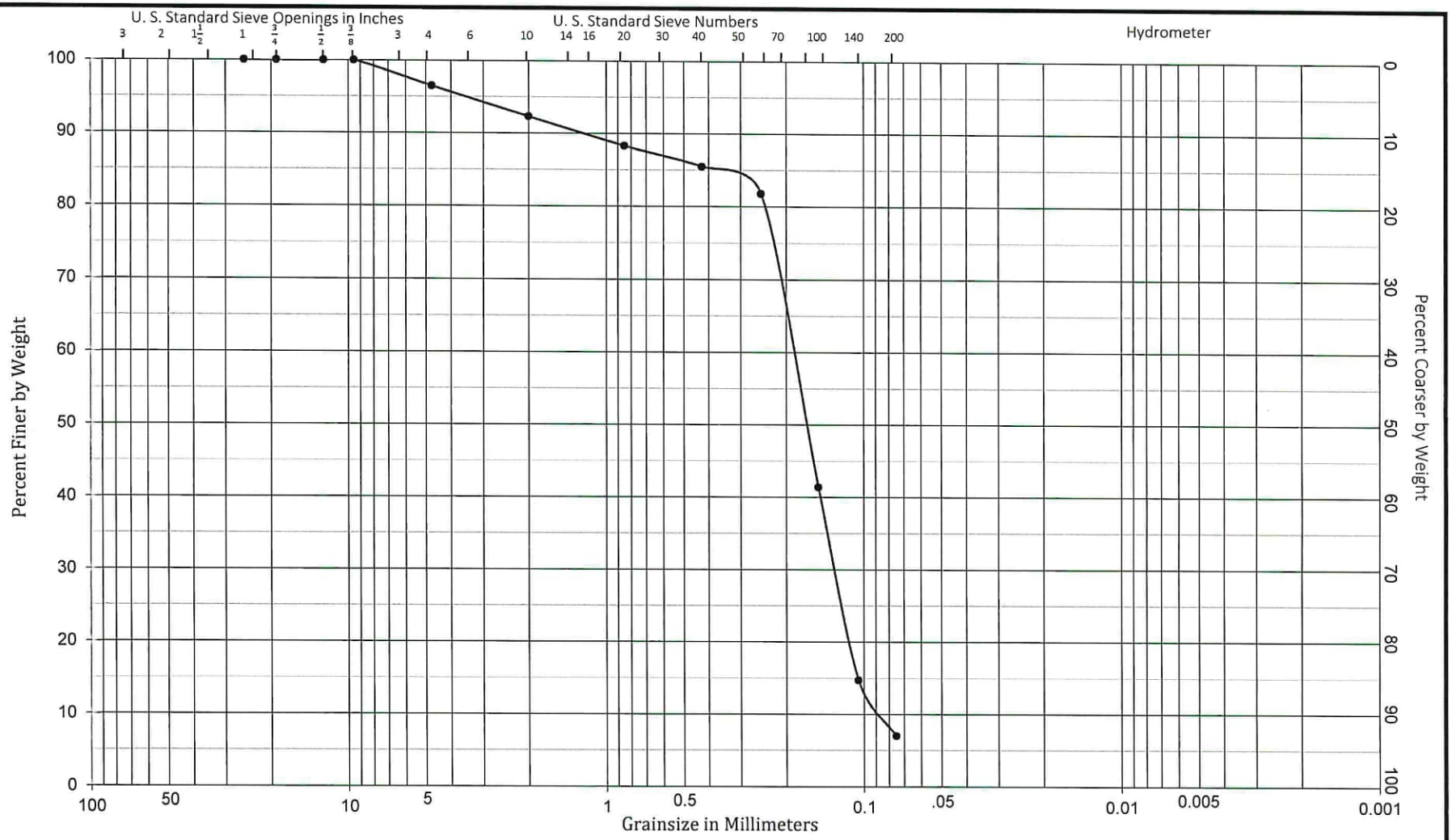
Number	Depth	Moisture	L.L.	P.L.	P.I.	Classification
P-6	6.0'-8.0'					Gray slightly silty Fine SAND with shell

CLIENT: CHA Consulting Services, Inc.

PROJECT: Water Main Replacement, Island Estates

FILE: DES 239057

DRIGGERS ENGINEERING SERVICES, INC.



	GRAVEL	SAND			SILT or CLAY
		Coarse	Medium	Fine	

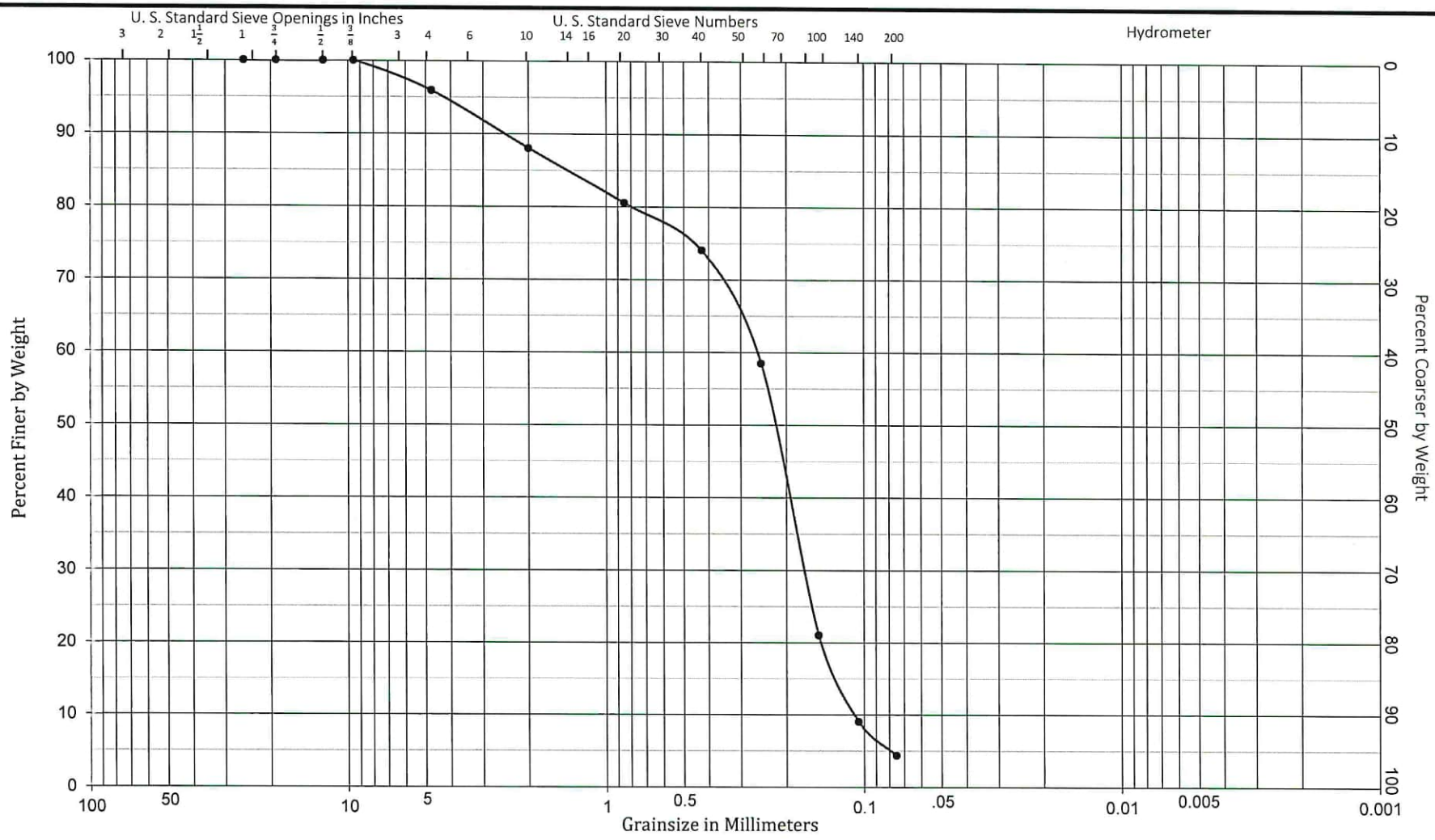
Number	Depth	Moisture	L.L.	P.L.	P.I.	Classification
P-8	8.0'-10.0'					Dark gray slightly silty Fine SAND with shell

CLIENT: CHA Consulting Services, Inc.

PROJECT: Water Main Replacement, Island Estates

FILE: DES 239057

DRIGGERS ENGINEERING SERVICES, INC.



GRAVEL	SAND			SILT or CLAY
	Coarse	Medium	Fine	

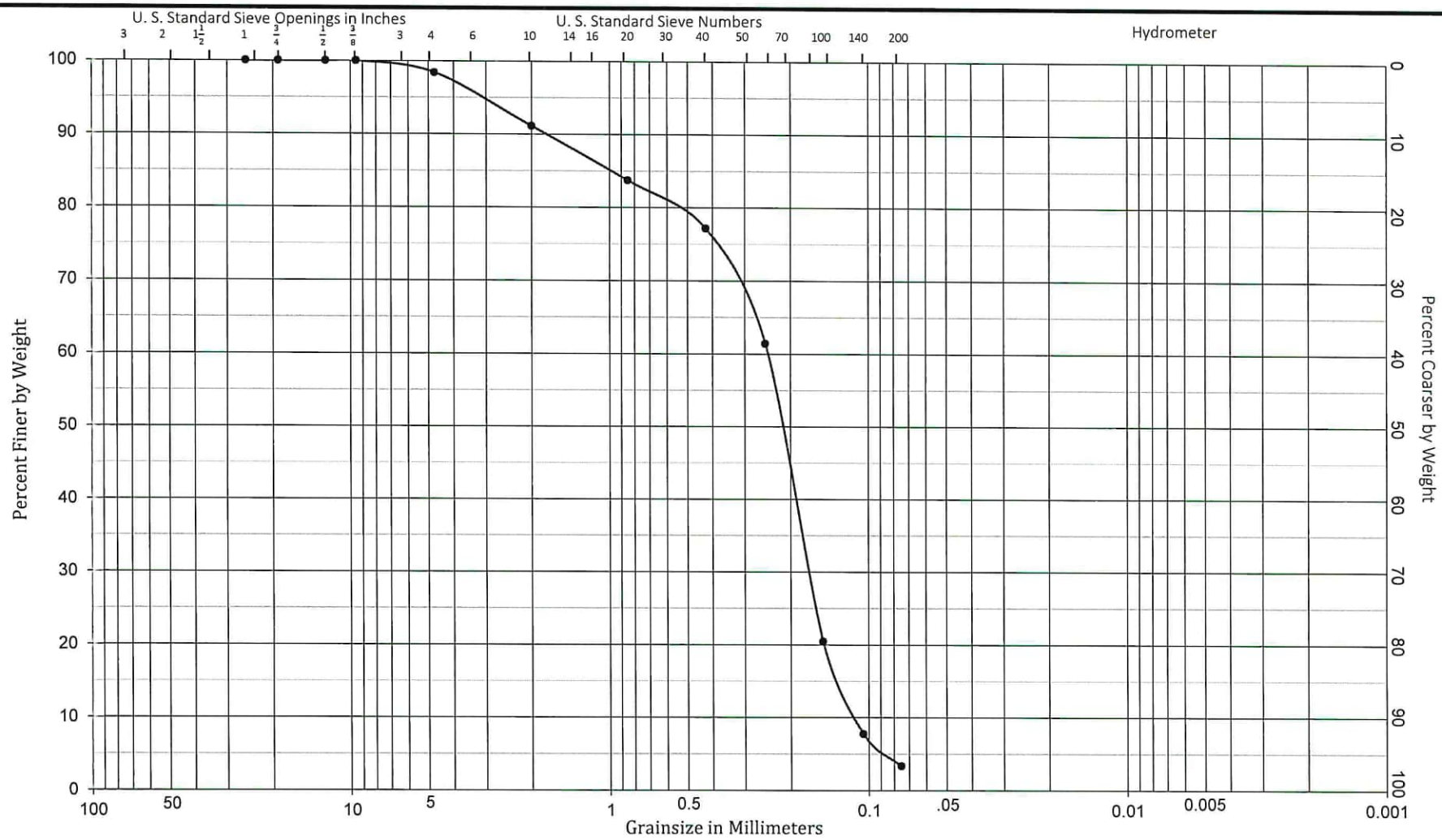
Number	Depth	Moisture	L.L.	P.L.	P.I.	Classification
P-11	4.4'-5.2'					Brown and gray Fine SAND with shell

CLIENT: CHA Consulting Services, Inc.

PROJECT: Water Main Replacement, Island Estates

FILE: DES 239057

DRIGGERS ENGINEERING SERVICES, INC.



GRAVEL	SAND			SILT or CLAY
	Coarse	Medium	Fine	

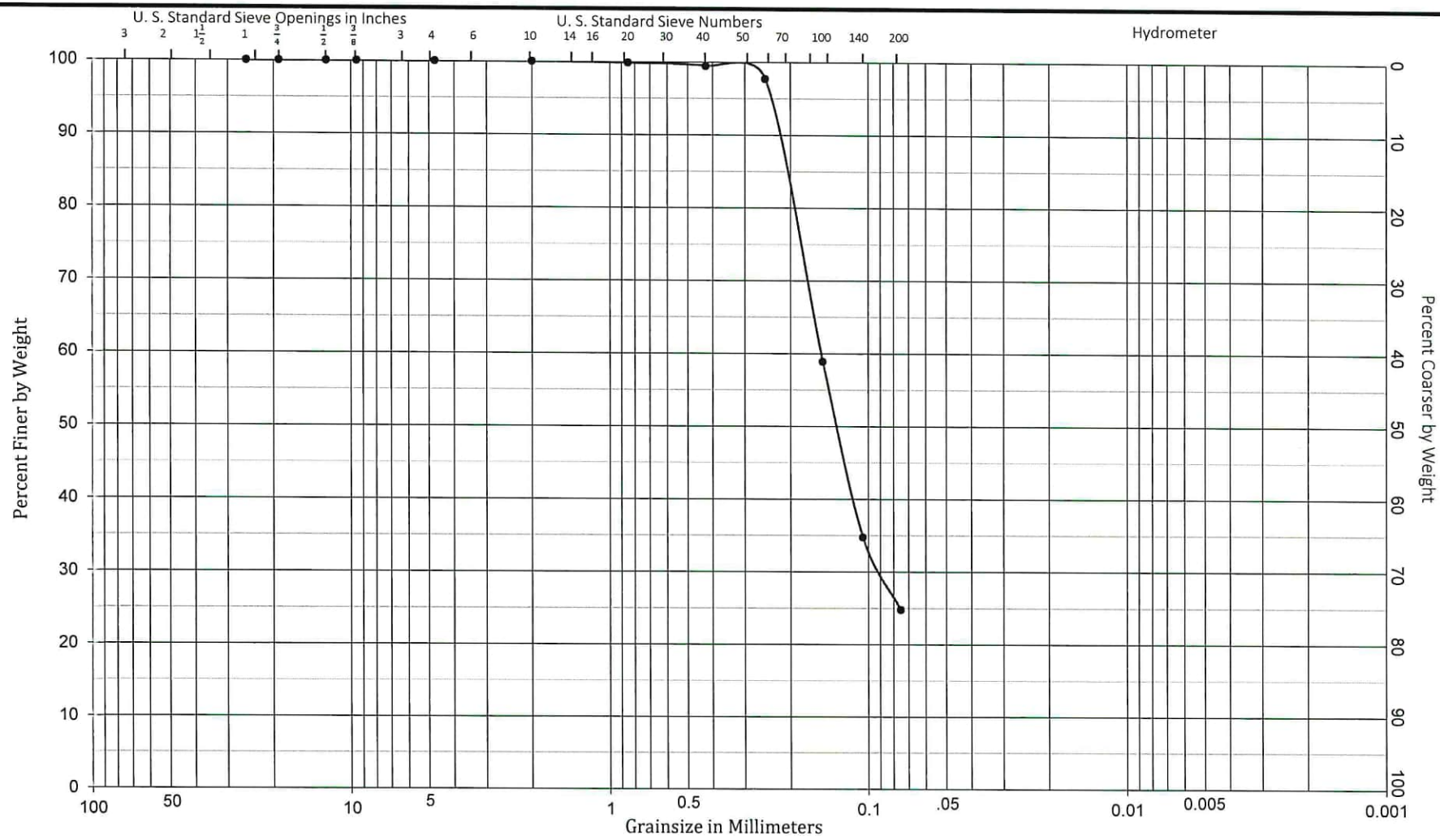
Number	Depth	Moisture	L.L.	P.L.	P.I.	Classification
P-11	6.0'-8.0'					Gray Fine SAND with shell

CLIENT: CHA Consulting Services, Inc.

PROJECT: Water Main Replacement, Island Estates

FILE: DES 239057

DRIGGERS ENGINEERING SERVICES, INC.



	GRAVEL	SAND			SILT or CLAY
		Coarse	Medium	Fine	

Number	Depth	Moisture	L.L.	P.L.	P.I.	Classification
P-13	6.0'-8.0'					Gray very silty Fine SAND

CLIENT: CHA Consulting Services, Inc.

PROJECT: Water Main Replacement, Island Estates

FILE: DES 239057

METHOD OF TESTING

STANDARD PENETRATION TEST
AND
SOIL CLASSIFICATION

STANDARD PENETRATION TEST (ASTM D-1586)

In the Standard Penetration Test borings, a rotary drilling rig is used to advance the borehole to the desired test depth. A viscous drilling fluid is circulated through the drill rods and bit to stabilize the borehole and to assist in removal of soil and rock cuttings up and out of the borehole.

Upon reaching the desired test depth, the 2-inch O.D. split-barrel sampler or "split-spoon", as it is sometimes called, is attached to an N-size drill rod and lowered to the bottom of the borehole. A 140-pound hammer, attached to the drill string at the ground surface, is then used to drive the sampler into the formation. The hammer is successively raised and dropped for a distance of 30 inches using a rope and "cathead" assembly. The number of blows is recorded for each 6-inch interval of penetration or until virtual refusal is achieved. In the above manner, the samples are ideally advanced a total of 18 inches. The sum of the blows required to effect the final 12 inches of penetration is called the blow count, penetration resistance or "N" value of the particular material at the sample depth.

After penetration, the rods and sampler are retracted to the ground surface where the core sample is removed, sealed in a glass jar and transported to the laboratory for verification of field classification and storage.

SOIL SYMBOLS AND CLASSIFICATION

Soil and rock samples secured in the field sampling operation were visually classified as to texture, color and consistency. The Unified Soil Classification was assigned to each soil stratum per ASTM D-2487. Soil classifications are presented descriptively and symbolically for ease of interpretation. The stratum identification lines represent the approximate boundary between soil types. In many cases, this transition may be gradual.

Consistency of the soil as to relative density or undrained shear strength, unless otherwise noted, is based upon Standard Penetration resistance values of "N" values and industry-accepted standards. "N" values, or blow counts, are presented in both tabular and graphical form on each respective boring log at each sample interval. The graphical plot of blow count versus depth is for illustration purposes only and does not warrant continuity in soil consistency or linear variation between sample intervals.

The borings represent subsurface conditions at respective boring locations and sample intervals only. Variations in subsurface conditions may occur between boring locations. Groundwater depths shown represent water depths at the dates and time shown only. The absence of water table information does not necessarily imply that groundwater was not encountered.

HAND CONE PENETRATION TEST

The cone penetration test was performed using a DGSI Model S-215 double rod Static Cone Penetrometer.

Dual rods enable the cone stress to be measured directly. Soil friction on the outer rod does not influence the reading. Depending upon the application, either the maximum bearing for an increment of push or the least bearing for an increment can be reported. If you were investigating for soft spots, you would take the least reading. In typical use, you would force the cone into the soil 6 inches, retract the cone slightly until the gauge reads zero, then advance an additional 6-inch increment. If you meet with refusal, the cone can be removed and the hole opened with a hand auger to permit a continuation of measurements against depth.

The tool has been designed to allow a maximum force of 250 lbs. to be applied, somewhat more than the average weight of an operator. The unit can be operated in a vertical or horizontal position. The cone tip has an included angle of 60 degrees. The cone has a section area of 1.5 cm^2. The maximum total bearing (Q_c) is 70 kg/cm^2.

The reading (Q_c) is in kg/cm^2 which is essentially equal to ton/ft^2.

The cone index (Q_c) is read directly. The correlation between the cone index and soil constants is not absolute. Generally, the following results have been determined through extensive field use of the unit. Further verification of correlation in your local soil types is essential.

Standard Penetration (Sands) N=Standard Penetration Test Blowcount $Q_c = 4N$	**Strength and Cohesion** Q_u - Unconfined compression (kg/cm^2) c - Cohesion (kg/cm2) Uniform clay and silty clays: $Q_c = 5\ Q_u$ $Q_c = 10\ c$ Clayey Silts: $Q_c = (10 \text{ to } 20)\ Q_u$ $Q_c = (20 \text{ to } 40)\ c$

PREFERRED PRODUCT LIST

City of Clearwater Preferred Product List

The list of preferred products shall be used for the construction of water and reclaimed water utilities for the City of Clearwater. This list does not relieve the Contractor from their responsiblity to conform to the City's Technical Specifications and Construction Standard Details. Products submitted for use on City projects which are not included in the list below shall be subject to the review and approval by the City.

Cat.	Description	Manufacturer	Potable Water		Reclaimed Water	
			Model	Comments	Model	Comments
Air Release Valve	ARV Enclosure	Water Plus Polyethelene Enclosure	H-20	Blue 28" Tall	H-20	Pantone 28" Tall
			H-30	Blue 44" Tall	H-30	Pantone 44" Tall
			H-40	Blue 30" Tall	H-40	Pantone 30" Tall
		DFW Plastics		Blue		Purple
	Air Release Valve	ARI	D-040 SS or Nylon	Combination	D-041SS	Combination
		H-TEC	SS 993		SS993	
		Vent-o-Mat	Series RBX DN50		Series RBX DN50	
Casing Seals/Spacers	Casing Seals	Advance Products	Model AC and AW		Model AC and AW	
		BWM Company	Model WR and PO		Model WR and PO	
		Cascade Water Works	Model CCES		Model CCES	
		CCI Pipeline	Model ESW and ESC		Model ESW and ESC	
		Pipeline Seal & Insulator	Model C and W		Model C and W	
		Power Seal	Model 4810ES		Model 4810ES	
	Casing Spacer	Advance Products	SS18/SS112		SS18/SS112	
		BWM Company	BWM-SS8/SS-12		BWM-SS8/SS-12	
		Cascade Water Works	Series CCS		Series CCS	
		CCI Pipeline	Model CCS8		Model CCS8	
		Pipeline Seal & Insulator	Series S8G/S12G-2		Series S8G/S12G-2	
Coatings	Exterior Coating for Exposed Metal Assets	Zinc/ Urethane/ Fluoropolymer system for above ground piping				
		Carboline	Primer: Carbozinc 621	3.0-8.0 mils	Primer: Carbozinc 621	3.0-8.0 mils
			1st Coat: Carbothane 133 HB	3.0-5.0 mils	1st Coat: Carbothane 133 HB	3.0-5.0 mils
			2nd Coat: Carboxane 950	2.0-3.0 mils	2nd Coat: Carboxane 950	2.0-3.0 mils
		Tnemec	Primer: Series 90-97 Tnemec-Zinc	2.5-3.5 mils	Primer: Series 90-97 Tnemec-Zinc	2.5-3.5 mils
			1st Coat: Series 66 Hi-Build Epoxoline	2.0-6.0 mils	1st Coat: Series 66 Hi-Build Epoxoline	2.0-6.0 mils
			2nd Coat: Series 700 Hydroflon	2.0-3.0 mils	2nd Coat: Series 700 Hydroflon	2.0-3.0 mils
		Zinc/Epoxy/Urethane system for above ground piping				
		Carboline	Carbozinc 621	3.0-8.0 mils	Carbozinc 621	3.0-8.0 mils
			Carboguard 60	4.0-6.0 mils	Carboguard 60	4.0-6.0 mils
			Carboxane 950	2.0-3.0 mils	Carboxane 950	2.0-3.0 mils
		Tnemec	Series 90-97 Tnemec-Zinc	2.5-3.5 mils	Series 90-97 Tnemec-Zinc	2.5-3.5 mils
			Series 66 Hi-Build Epoxoline	2.0-6.0 mils	Series 66 Hi-Build Epoxoline	2.0-6.0 mils
			Series 1095 Urethane	4.0-10.0 mils	Series 1095 Urethane	4.0-10.0 mils
		Polyamide Epoxy- Coal Tar for Burried Pipes				
		Tnemec	1st Coat: Series 46H-413 Hi-Build Tneme Tar	8-10.0 Mils	1st Coat: Series 46H-413 Hi-Build Tneme Tar	8-10.0 Mils
			2nd Coat: Series 46H-413 Hi-Build Tneme Tar	8-10.0 Mils	2nd Coat: Series 46H-413 Hi-Build Tneme Tar	8-10.0 Mils
Fittings	Ductile Iron Fittings	American		Cement or FBE Lined		Cement or FBE Lined
		Sigma		Cement or FBE Lined		Cement or FBE Lined
		Star		Cement or FBE Lined		Cement or FBE Lined
		Tyler Union		Cement or FBE Lined		Cement or FBE Lined
Hydrants	Hydrants	American Flow Control	Darling B-84-B-5		Hydrants are not acceptable for Reclaimed Water Applicatons.	
		AVK	Nostalgic 2780			
		EJ Co.	Watermaster 5CD250			
		Kennedy	Guardian No. K-81D			
		Mueller	Super Centurion No 250			

City of Clearwater Preferred Product List

The list of preferred products shall be used for the construction of water and reclaimed water utilities for the City of Clearwater. This list does not relieve the Contractor from their responsiblity to conform to the City's Technical Specifications and Construction Standard Details. Products submitted for use on City projects which are not included in the list below shall be subject to the review and approval by the City.

Cat.	Description	Manufacturer	Potable Water		Reclaimed Water	
			Model	Comments	Model	Comments
Joint Restraints	Ductile Iron Pipe MJ Restraint	EBAA Iron	Megalug Series 1100		Megalug Series 1100	
		Ford/Uniflange	UFR-1400		UFR-1400	
		Sigma	OneLok Series SLD/SLDE		OneLok Series SLD/SLDE	
		Smith Blair	Camlock Series 111		Camlock Series 111	
		Star	Star Grip Series 3000		Star Grip Series 3000	
		Tyler Union	TufGrip Series TLD		TufGrip Series TLD	
	Ductile Iron Pipe Bell Joint Restraints (4-12")	EBAA Iron	Tru-Dual Series 1500 TD		Tru-Dual Series 1500 TD	
		Ford/Uniflange	Uni-Flange Series 1390C		Uni-Flange Series 1390C	
		Sigma	PV-Lok Series PWP-C		PV-Lok Series PWP-C	
		Smith Blair	Bell-Lock Series 165		Bell-Lock Series 165	
		Star	StarGrip Series 3100S		StarGrip Series 3100S	
		Tyler Union	TufGrip-Series 300C		TufGrip-Series 300C	
	Ductile Iron Pipe Bell Joint Restraints (>16")	EBAA Iron	Series 1100HD		Series 1100HD	
		Sigma	Series SSLDH		Series SSLDH	
		Star	Series 3100S		Series 3100S	
	Ductile Iron Pipe Joint Restraint Gaskets and Locking Bell	American	Fast Grip Gasket	Gasket	Fast Grip Gasket	Gasket
			Flex Ring Joint	Bell Lock	Flex Ring Joint	Bell Lock
			Lok Ring Joint	Bell Lock	Lok Ring Joint	Bell Lock
		McWane	Sure Stop 350 Gasket	Gasket	Sure Stop 350 Gasket	Gasket
			Thrust Lock	Bell Lock	Thrust Lock	Bell Lock
			TR- Flex	Bell Lock	TR- Flex	Bell Lock
		US Pipe	Field Lok 350 Gasket	Gasket	Field Lok 350 Gasket	Gasket
			Field Lok Gasket	Gasket	Field Lok Gasket	Gasket
			TR-Flex	Bell Lock	TR-Flex	Bell Lock
			HP Lok Restraint Joint	Bell Lock	HP Lok Restraint Joint	Bell Lock
	PVC Pipe MJ Restraint	EBAA Iron	Megalug Series 2000PV		Megalug Series 2000PV	
		Ford/Uniflange	UFR 1500 Series		UFR 1500 Series	
		Sigma	OneLok Series SLG/SLE		OneLok Series SLG/SLE	
		Smith Blair	Cam Lok Series 120		Cam Lok Series 120	
		Star	Star Grip Series 4000		Star Grip Series 4000	
		Tyler Union	TufGrip Series TLP		TufGrip Series TLP	
	PVC Bell Joint Restraint (4"-12") (New and Existing)	EBAA Iron	Series 1600		Series 1600	
		Ford/Uniflange	Uni-Flange Series 1390		Uni-Flange Series 1390	
		Sigma	PV-Lok Series PWP		PV-Lok Series PWP	
		Smith Blair	Bell-Lock Series 165		Bell-Lock Series 165	
		Star	Series 1100C		Series 1100C	
		Tyler Union	TufGrip 300C		TufGrip 300C	
Locator Wire	Locator Wire	Copperhead Industries	1045B-EHS	Open Cut or Directional Drill	1045P-EHS	Open Cut or Directional Drill
			3/16B-PB	Pipe Bursting	3/16P-PB	Pipe Bursting
		Protrace	HDD-CCS PE45	Open Cut or Directional Drill	HDD-CCS PE45	Open Cut or Directional Drill
		Agave	BT-1001	Open Cut or Directional Drill	BT-1001	Open Cut or Directional Drill
			BT-3/16SS	Pipe Bursting	BT-3/16SS	Pipe Bursting

City of Clearwater Preferred Product List

The list of preferred products shall be used for the construction of water and reclaimed water utilities for the City of Clearwater. This list does not relieve the Contractor from their responsiblity to conform to the City's Technical Specifications and Construction Standard Details. Products submitted for use on City projects which are not included in the list below shall be subject to the review and approval by the City.

Cat.	Description	Manufacturer	Potable Water		Reclaimed Water	
			Model	Comments	Model	Comments
Pipe	PVC C900 DR 18 Bell and Spigot (Up to 12")	Diamond Plastics Corp	C-900	Blue	C-900	Pantone Purple
		JM Eagle	C-900	Blue	C-900	Pantone Purple
		National Pipe & Plastics	C-900	Blue	C-900	Pantone Purple
		North American Pipe Corp	C-900	Blue	C-900	Pantone Purple
	Restrained Joint PVC Pipe for Directional Drilling	CertainTeed	Certa-Lok-C900		Certa-Lok-C900	
		JM Eagle	Eagle Loc 900		Eagle Loc 900	
	HDPE C906 DR 11	JM Eagle		DR-11 Blue		DR-11 Pantone Purple
		Performance Pipe (Chevron)		DR-11 Blue		DR-11 Pantone Purple
		Poly Pipe		DR-11 Blue		DR-11 Pantone Purple
	Ductile Iron Pipe	American	Cement Lined		Cement Lined	
		Griffin	Cement Lined		Cement Lined	
		McWane	Cement Lined		Cement Lined	
		US Pipe	Cement Lined		Cement Lined	
Polywrap	Polywrap	American		Blue		Pantone Purple
		Christys		Blue		Pantone Purple
		Trumbull		Blue		Pantone Purple
		US Pipe		Blue		Pantone Purple
Repair Clamp	Repair Clamp	JCM	JCM 118		JCM 118	
		Romac	SS2 or SS3		SS2 or SS3	
Services	Ductile Iron Service Saddle	Ford	FC202		FC202	
		JCM	Series 406		Series 406	
		Mueller	DR2S Series		DR2S Series	
		Romac	202N Series		202N Series	
		Smith Blair	397, 317 Series		397, 317 Series	
	Service Saddle for HDPE Pipe	Ford	FCP-202 Series	With Spring Washers	FCP-202 Series	With Spring Washers
		JCM	Series 406	With Spring Washers	Series 406	With Spring Washers
		Romac	202N-H Series	With Spring Washers	202N-H Series	With Spring Washers
		Smith Blair	317 Series	With Spring Washers	317 Series	With Spring Washers
	Corporation Stop- Threaded	Ford	FB400-6	1 1/2"	FBRW1000-4Q	1" shall be ball corporation stop. 2" shall be threaded corporation stop.
			FB400-7	2"		
		Mueller	H-10003N	1"	B-25008-20	
			B-2996N	1 1/2"		
			B-2996N	2"		
	Curb Stops	Ford	B43-332 WQ	with Lock Wing and Compression Inlet	BRW 43-444W-Q	Reclaimed Water shall be stamped on curb stops
					BRW 41-777W-Q	
		Mueller	Mueller H24350	with Lock Wing and Compression Inlet	B24353 N-20	
					B25170 N-20	
	Polyethylene Tubing	Charter				
		Endot				
		JM Eagle				
	Meter Boxes	Armorcast Product				
		Carson				
		Hubbell				
Tapping Sleeves and Valves	Line Stops	JCM	JCM 442		JCM 442	
		Smith Blair	680		680	
	Tapping Sleeves	JCM	JCM 412		JCM 412	
			JCM 452		JCM 452	
		Smith Blair	622		622	
	Tapping Valve	American	Seriess 2500		Seriess 2500	
		Clow	Series F-6114		Series F-6114	
		Mueller	Series T2361		Series T2361	

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Cat.	Description	Manufacturer	Potable Water		Reclaimed Water	
			Model	Comments	Model	Comments
Valves	Butterfly Valve	Clow	#1450	24" and above	#1450	24" and above
		Dezurik	BAW	24" and above	BAW	24" and above
		Pratt		24" and above		24" and above
	Gate Valve	American	Series 2500 NRS		Series 2500 NRS	
		Clow	Series F-6100		Series F-6100	
		Mueller	Series A-2360		Series A-2360	
	OS&Y Valves	American	Series 2500 OS&Y		Series 2500 OS&Y	
		Clow	2638, 2639, or 2640		2638, 2639, or 2640	
		Mueller	R-2360		R-2360	
Valve Box	Sigma					
	Star					
	Tyler Union					