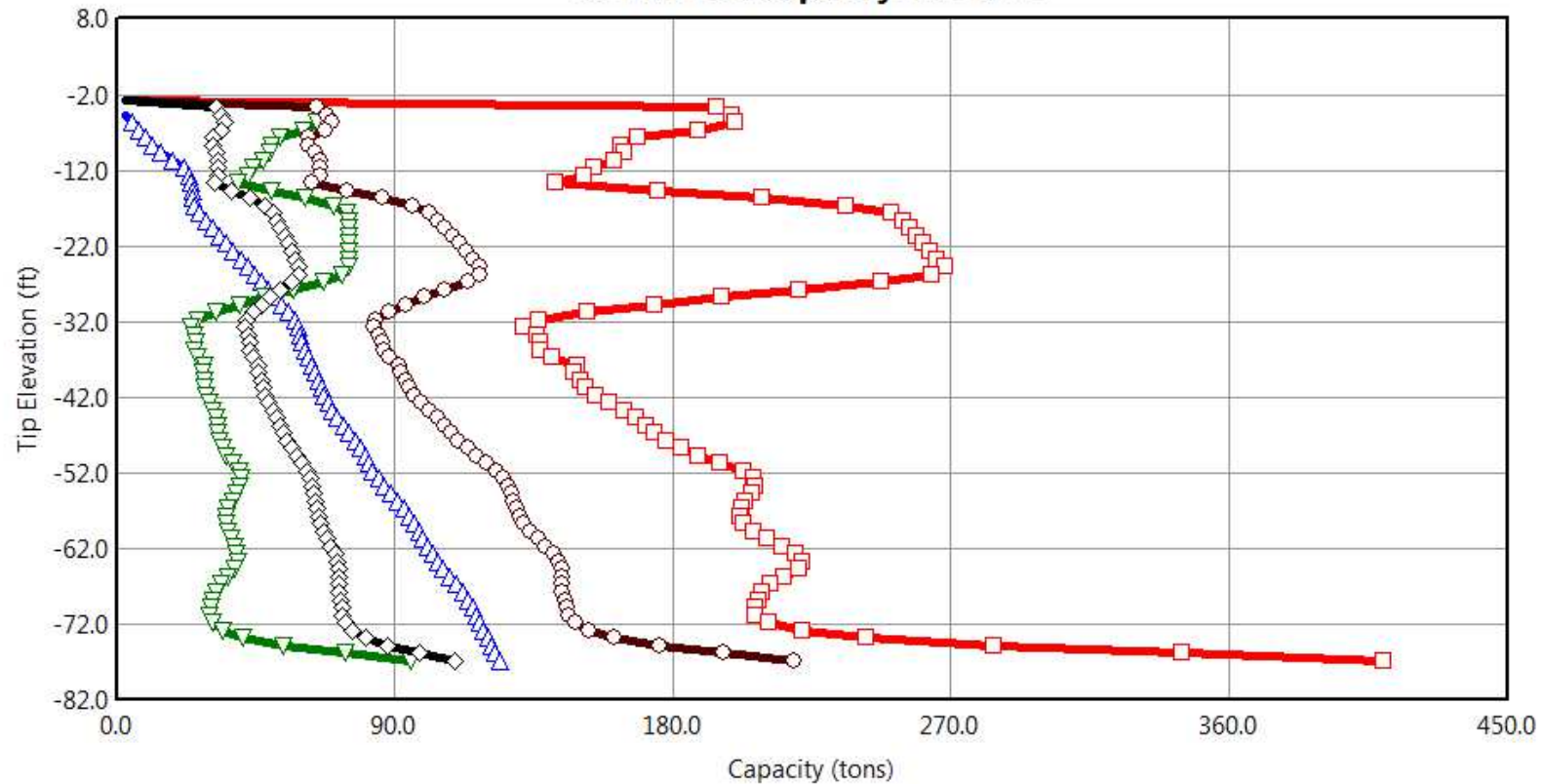


Job Name: CR-880

State Job (Project) #: 2000-01-21005

Driven Pile Capacity: IDs 1-86



Curves

☒ Ultimate Side Friction☒ Mobilized End Bearing☒ Ultimate Pile Capacity☒ Estimated Davisson Capacity☒ Allowable Pile Capacity

*The 'Save to File' button saves the currently selected Curves to a text file.

Driven Pile Data

Boring Number: B-4
Ground Surface Elevation 17.30 (ft)
Section: Square
Width 18.00 (in)

Project Data

File: B-4-Void-21
Date: Sep 05, 2023
Engineer: ZP

Analysis Data

Analysis Type: SPT

Plot Options

CustomizeUpdate PlotPrint PlotPrint WindowSave To File

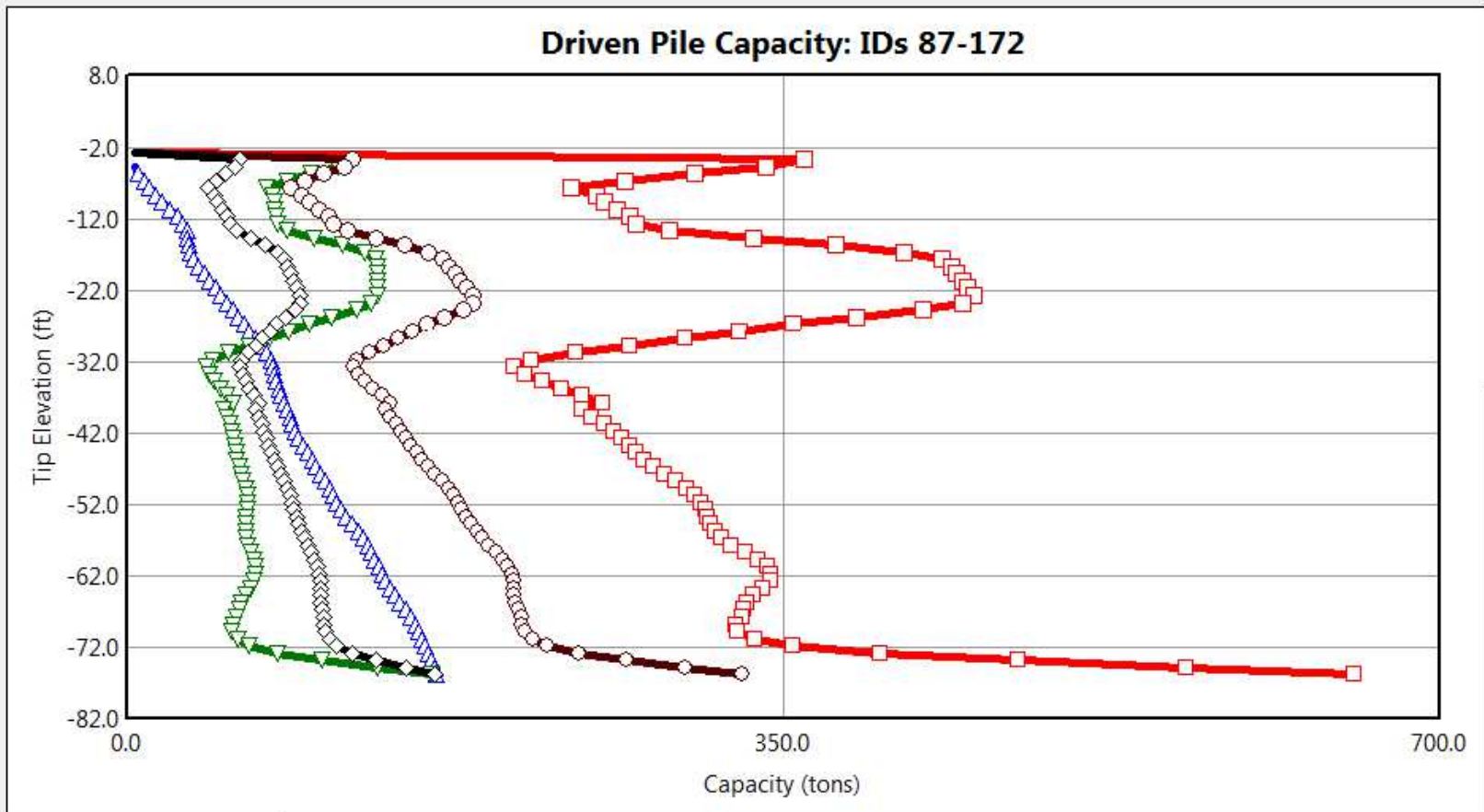
SSP-111D

Close

B-4-Void-21.0ft_Preform(-35ft).in

Job Name: CR-880

State Job (Project) #: 2000-01-21005



Curves

☒ Ultimate Side Friction☒ Mobilized End Bearing☒ Ultimate Pile Capacity☒ Estimated Davisson Capacity☒ Allowable Pile Capacity

*The 'Save to File' button saves the currently selected Curves to a text file.

Driven Pile Data

Boring Number: B-4
Ground Surface Elevation 17.30 (ft)
Section: Square
Width 24.00 (in)

Project Data

File: B-4-Void-21
Date: Sep 05, 2023
Engineer: ZP

Analysis Data

Analysis Type: SPT

Plot Options

CustomizeUpdate PlotPrint PlotPrint WindowSave To File

SSP-112D

Close

B-4-Void-21.0ft_Preform(-35ft).in

APPENDIX – C

PILE DATA TABLE

TABLE - C1
[PBC PROJECT NO.: 2019803]

PILE DATA TABLE																		
BRIDGE No.	INSTALLATION CRITERIA								DESIGN CRITERIA									MAX PILE CUT-OFF ELEVATIONS
	PIER or BENT NUMBER	PILE SIZE (in)	NOMINAL BEARING RESISTANCE (tons)	NOMINAL UPLIFT RESISTANCE (tons)	MINIMUM TIP ELEVATION (ft)	TEST PILE LENGTH (ft)	REQUIRED JET ELEVATION (ft)	REQUIRED PREFORM ELEVATION (ft) *	FACTORED DESIGN LOAD (tons)	FACTORED DESIGN UPLIFT LOAD (tons)	DOWN DRAG (tons)	TOTAL SCOUR RESISTANCE (tons)	NET SCOUR RESISTANCE (tons)	100-YEAR SCOUR ELEVATION (ft)	LONG TERM SCOUR ELEVATION (ft)	RESISTANCE FACTOR- φ (Uplift)	RESISTANCE FACTOR- φ (Compression)	
XXXXXX	EB 1	18	167	N/A	-37.0	76	N/A	-35.0	108.6	N/A	N/A	N/A	N/A	11.8	N/A	N/A	0.65	+14.5
	IB 2	18	202	N/A	-46.0	93	N/A	-35.0	131.3	N/A	N/A	N/A	N/A	2.2	N/A	N/A	0.65	+14.7
	IB 3	18	211	N/A	-61.0	98	N/A	-35.0	137.2	N/A	N/A	N/A	N/A	-6.4	N/A	N/A	0.65	+14.4
	IB 4	18	212	N/A	-51.0	106	N/A	-35.0	137.8	N/A	N/A	N/A	N/A	-6.4	N/A	N/A	0.65	+14.3
	IB 5	18	171	N/A	-46.0	102	N/A	-35.0	111.2	N/A	N/A	N/A	N/A	2.2	N/A	N/A	0.65	+14.2
	EB 6	18	126	N/A	-37.0	76	N/A	-35.0	81.9	N/A	N/A	N/A	N/A	11.8	N/A	N/A	0.65	+13.7

* - Required preform elevation -35.0 feet is needed to penetrate the hard limestone/sand layer.

Note:

	$\frac{(\text{Factored Design Load} + \text{Net Scour Resistance} + \text{Down Drag})}{\phi} \leq \text{Nominal Bearing Resistance}$
UPLIFT RESISTANCE -	The ultimate side friction capacity that must be obtained below the 100 year scour elevation to resist pullout of the pile (Specify only when design require uplift capacity).
TOTAL SCOUR RESISTANCE -	An estimate of the ultimate static side friction resistance provided by the scourable soil.
NET SCOUR RESISTANCE -	An estimate of the ultimate static side friction resistance provided by the soil from the required preformed or jetting elevation to the scour elevation.
100-YEAR SCOUR ELEVATION-	Estimated elevation of scour due to the 100 year storm event.
LONG TERM SCOUR ELEVATION -	Estimated elevation of scour used in design for extreme event loading.

PILE INSTALLATION NOTES:

Contractor to verify location of all utilities prior to any pile driving.	No jetting will be allowed without the approval of the Engineer
Minimum Tip Elevation is required for lateral stability or tension capacity at all locations and shall meet the requirements of section 455 of the specifications.	The Contractor should not anticipate being allowed to jet piles below the minimum tip elevation.
When a required jetting elevation is shown, the jet shall be lowered to the elevation and continue to operate at this elevation until the pile driving is completed. If jetting or preforming elevations differ from those shown on the table, the Engineer shall be responsible for determination of the required driving resistance.	At each Bent, pile driving is to commence at the center of the Bent and proceed outward.

Date: October 21, 2022

Prepared by: **GCME, Inc.**

TO: Stanley Consultants, Inc
1641 Worthington Road, Suite 400
West Palm Beach, FL 33409

Attention: **Mr. Amin Ahmed, P.E.**
Senior Project Manager

SUBJECT: **Geotechnical Services Report – Preliminary
Roadway Improvements**
CR-880: Sam Senter Road over SFWMD Ocean Canal
Palm Beach County, Florida
PBC Project No.: 2019803
GCME Project No.: 2000-01-21005

Dear Mr. Ahmed,

GCME, Inc. has completed the Preliminary Geotechnical Report for the roadway improvement in connection with the subject project. The purpose of this report is to provide geotechnical information to the roadway engineers and for preparation of the plans for the proposed improvements. The following report includes the methods of study, evaluations, and recommendations concerning geotechnical aspects for the proposed roadway improvements.

The work was completed following our contract with your firm and followed the basic guidelines of the Florida Department of Transportation (FDOT) Soils and Foundations Handbook, 2020. This report is written using English units.

-00000-

We are pleased to be of continued service to Stanley Consultants, Inc. and Palm Beach County. If you have any questions or comments regarding the contents of the following report, please call.

Very truly yours,

GCME, INC.



Zhijun Pan, P.E.
Senior Project Engineer
FL. Reg. No. 70634



Partha Ghosh, P.E.
Principal Engineer
FL Registration No. 51377

ZP/PG: mg
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1.0 INTRODUCTION

The project site is located along CR-880 and Sam Senter Road, in Palm Beach County. Land in the project vicinity is rural. Terrain in the area is relatively flat. The subject project corridor consists of generally one (1) lane of through traffic in each direction, eastbound and westbound.

The limit of this project extends from 2,300 feet west, 1,900 feet east, and 400 feet north of the intersection of CR-880 and Sam Senter Road. The scope of the project consists of widening an approximately 0.8-mile section of CR-880 to the south, and either reconstructing or milling and resurfacing the existing CR-880.

The details of the field exploration performed as per our scope of services authorized/negotiated with Palm beach County are as follows:

1. For the proposed roadway widening:
 - a. Drill six (6) SPT borings (1,000 feet spacing) to depths of 20 feet to get to the bottom of organic soil / muck.
 - b. Drill twenty-two (22) SPT borings (200 feet spacing) to depths of 10 feet.
 - c. Muck Probes.
 - d. Collect two (2) undisturbed Shelby tube samples of the organics soils for consolidation testing.
 - e. Samples of the soils encountered will be obtained and the depth to the groundwater level will be measured and recorded for each of the borings. Following completion of the drilling and testing, the boreholes will be backfilled with grout.
 - f. Collect 2 bulk subgrade samples for Limerock Bearing Ratio (LBR) determinations.
2. For the existing roadway:
 - a. Perform six (6) asphalt cores.
 - b. Drill six (6) SPT borings (1,000 feet spacing) to depths of 20 feet to get to the bottom of organic soil / muck.
 - c. Collect one (1) undisturbed Shelby tube samples of the organics soils for consolidation testing.

2.0 FIELD INVESTIGATION

In summary, our field testing program for the project consisted of drilling thirty-one (31) Standard Penetration Test (SPT) borings, seven (7) pavement cores and four (4) undisturbed shelly tube samples along the project corridor for roadway improvements. The borings were drilled to depths of 10 to 20 feet below existing grade. We also performed sixty-seven (67) muck probes to find out the limit and thickness of muck at toe of existing embankment along the south side of roadway corridor.

The numbering schedule and location of the borings drilled for the proposed improvements of the roadway corridor are as follows:

- Along south side of CR-880:
(10' SPT Borings) Twenty-two (22) borings, R-101 thru. R-122
- Along Sam Senter Road:
(10' SPT Borings) Three (3) borings, R-201 thru. R-203
- Along south side of CR-880:
(20' SPT Borings) Six (6) borings, R-301 thru. R-306
- Along CR-880:
(Cores & 20' SPT Borings) Six (6) pavement cores, PC-1 thru. PC-6
- Along Sam Senter Road: One (1) pavement core, PC-7
- Along CR-880: Four (4) Shelby tube samples
- Along south side of CR-880: Two (2) LBR samples, LBR-1 & LBR-2
- Along south side of CR-880: Sixty-seven (67) Muck Probes, 1A thru. 42A

The approximate locations of the borings and pavement cores are presented on 'Approximate Boring Location Plan', Plate 1 through 11.

The SPT borings were advanced using mud rotary procedures. The borings were drilled to depth of 10 to 20 feet below grade. Samples of the in-place materials were recovered with a standard split barrel advanced with a 140-pound hammer falling 30 inches (the SPT after ASTM D 1586). Soil samples were field classified, placed in sealed containers and transported to our laboratory for further analysis by a soils engineer. Classification of the subsoils found in the boring followed the American Association of State Highway and Transportation Officials (ASSHTO) Soil Classification System.

3.0 LABORATORY TESTS

Representative samples recovered from the borings were visually reviewed in the laboratory by a geotechnical engineer to confirm the field classification. The recovered samples for the borings were classified in general accordance with the American Association of State Highway and Transportation Officials (ASSHTO) Soil Classification System. The visual classification of the soil was confirmed with the use of the laboratory test results. Laboratory index tests consisting of natural moisture content, organic content determination and sieve analyses were performed on selected samples. The laboratory index property test results of samples recovered from the borings are presented on Table – 1 and are also summarized in the Table – 1A.

In addition to the index property testing performed, three (3) consolidation tests were completed on the undisturbed Shelby tube samples taken from the organic (muck) soil layer to evaluate the compressibility aspects of the peat. The tests were performed in accordance with ASTM D 2435. The results of the consolidation tests indicate that the peat samples along the project corridor are

over-consolidated, with pre-consolidation pressures in the range of 1934 psf to 2960 psf. Compression index values ranged between 3.73 and 4.47. Recompression index values varied from 0.36 to 0.64. Coefficient of consolidation values mostly ranged between 0.024 and 3.531 foot²/day for applied stresses from 60 psf to 8000 psf. A summary of the consolidation test results is presented in Table – 2.

As described above, the laboratory results indicate that the peat is over-consolidated (please note, one sample is obtained from below existing embankment/asphalt pavement, one sample was obtained from embankment shoulder, and one sample is obtained from toe of embankment.) with an average maximum past vertical stress of about 2600 psf, which is higher than the present vertical stress of the peat inside or outside of the embankment. This is somewhat surprising since peat is a young “soil” and there should not have historically been a naturally occurring layer of overburden soil above it. It is difficult to know the source of the historical overburden. It may have been man placed fill that was removed at some point in the past or it may be the result of vehicle traffic and/or desiccation of the peat.

In addition, bulk samples of the upper 1 to 3 feet of soils were collected at two (2) different locations along the project corridor roadway for determination of the Limerock Bearing Ratio. The results are presented in Table – 3, followed by the graphs.

The corrosion parameters of pH, resistivity, sulfates and chlorides were measured for canal water samples and soil sample from the borings. The test results were compared with FDOT criteria for corrosivity to enable the materials to be classified accordingly. Corrosion series tests results are presented in Table – 4.

4.0 USDA, SCS SOIL SURVEY

Research of the U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS) Soil Survey of the Palm Beach County indicates the presence of different soil map units along the roadway sections. The soil map units present along the project corridor are described in details in Appendix – A. A segment of the USDA Soils Map showing the proposed roadway section and the surrounding areas is also presented in Appendix – A.

5.0 PAVEMENT CONDITION SURVEY

The pavement cores and pavement condition summary data for the roadway corridor are provided in a separated report. Please note, the soil profiles for the borings drilled at the pavement core locations are utilized and provided in this report.

6.0 SUBSURFACE CONDITIONS

The borings disclosed that the project corridor is generally underlain with sands or interlayering of sands, silty sands, silt, limestone and organic soils (OL/Peat). The subsurface geologic profiles encountered at the roadway boring location, along with the SPT results, are presented on Figures 1 through 4. The subsurface geologic profiles encountered at the pavement cores / borings location are presented on Figure – 5. The soil profiles are drawn with reference to elevations. The station,

offset and elevation information of borings are provided by the project surveyor.

The subsurface conditions found in the borings located within the roadway generally consisted of about 12 to 26 inches of asphaltic concrete over about 2 to 6 feet of embankment fill materials (i.e. sand with some shell fragments and limerock gravels).

Beneath the fill (and starting at the ground surface at the off-road boring locations at shoulder / toe of embankment) there is silty to clayey peat. The peat thickness ranged between 2 and 10 feet.

The peat thickness was greater beneath the existing embankment (where it ranged from 5 to 10 feet thick) than it was in the off-road borings. The peat thickness generally ranged from 4 to 5 feet in the borings at shoulder, and generally ranged from 2 feet in the borings at toe of embankment. The reason for this is not clear but it could possibly be that during the original embankment construction the first few feet of fill that was placed over the naturally occurring peat. This additional peat might have been obtained during excavation of the canal to the north.

A formation of silty, sandy limestone (that is sometimes highly weathered to the state of a shelly clayey sand or sandy clay) was generally found below the peat. In most of the borings the limestone is interlayered by fine silty sand or stiff silt with trace to some shell fragments and limestone fragments. This limestone layer generally extends to the maximum depth of exploration (approximately elevation -35 feet, NAVD, as indicated in the bridge boring soil profiles).

Descriptions of the various strata found in the borings are presented in following section.

6.1 Stratigraphy

Soils and soil profiles encountered in SPT borings drilled underneath the roadway / pavement for the project roadway corridor study generally consisted of ten (10) general types:

Stratum P: Asphalt pavement.

Stratum 1: Base – Light brown to gray fine to medium Sand, some shell fragments and limerock gravels, some clayey sand lenses (A-1-b, A-2-4).

Stratum 1A: Dark brown to brown Sand with trace roots (Topsoil / A-8).

Stratum 2: Dark brown to black silty, clayey Peat (A-8).

Stratum 3: Light brown to gray silty, sandy Limestone, shell fragments, weakly to well cemented.

Stratum 4: Light gray weathered Limestone.

Stratum 5: Light brown to gray Silty Sand with few to some limestone fragments and shell fragments (A-1-b, A-2-4).

Stratum 5A: Light brown to gray Silt with trace to few limestone fragments (A-4).

Stratum 5B: Brown Sand with silt, trace to few limerock fragments (A-3).

Stratum 5C: Light brown Silty Sand and some shell fragments (A-1-b).

Stratum P is asphalt pavement.

Stratum 1 is base and is classified as A-1-b or A-2-4, consists of select materials and is adequate for subgrade and embankment support.

Stratum 1A is topsoil (A-8) and considered to be unsuitable material and shall be removed in accordance with subsoil excavation referenced in FDOT Standard Plans 120-002 and Standard Specification Section 120.

Stratum 2 consists of organic soils classified as A-8 materials. These soils are found along the project corridor with organic content ranging from 6.1% to 89.3%.

Stratum 3 and 4 consist of limestone.

Stratum 5 is silty sand with fine content ranging from 11.8% to 35.2%. Stratum 5 soils are classified as A-1-b and A-2-4, consist mainly of soils with high fines content and are likely to retain some excess moisture and could be difficult to handle, place and compact compared to A-3 materials.

Stratum 5A is silt material with fine content ranging from 37.2% to 60.4%. Stratum 5A soils are classified as A-4 (plastic soil). These soils are usually present about 2 feet or more below the existing grade. Based on the proposed final grade of the improved roadway, removal of these soils will not be necessary.

Stratum 5B classified as A-3, consists of select material and is adequate for subgrade and embankment support, and should be utilized according to Standard Plans, Index 120-001.

Stratum 5C is silty shelly sand with fine content ranging 11.9%. Stratum 5C soils are classified as A-1-b, consist mainly of soils with high fines content and are likely to retain some excess moisture and could be difficult to handle, place and compact compared to A-3 materials.

Figures RSS-1, Cross Section Soil Survey for the Design of Roads, describes the various strata that were encountered during the study of the project corridor and presents test results for each stratum and general recommendation for handling each soil stratum.

6.2 Groundwater

The depths to the groundwater table measured in each of the borings are indicated in the soil profiles on Figures 1 through 5, and are present in Table – 5.

For all the borings (including bridge borings) drilled along the project corridor, the overall groundwater depth varied from 2.5 to 12.7 feet, which corresponding to elevation +4.1 feet to +10.1 feet, NAVD.

For the 20 feet SPT borings drilled at the pavement core locations along CR-880, groundwater was generally not encountered excepting at one boring PC-5 (where groundwater depth was 11.3 feet, corresponding to elevation +6.4 feet NAVD).

For the borings drilled along CR-880 at shoulder, groundwater was generally not encountered within upper 10 feet, excepting at four (4) boring locations (where groundwater depth varied from 9.0 to 11.5 feet, corresponding to elevation +6.2 to +8.1 feet, NAVD) which are located at east of Sam Sent Road.

For the borings drilled along CR-880 at toe of embankment slope, groundwater depth varied from 2.5 to 4.5 feet, corresponding to elevation +5.2 to +10.1 feet, NAVD) which are located at east of Sam Sent Road.

For the borings drilled along Sam Sent Road at shoulder, groundwater depth varied from 9.0 to 10.0 feet, excepting at one (1) location R-201 (where groundwater was not encountered), corresponding to elevation +4.7 to +6.2 feet, NAVD.

The groundwater levels along the project corridor will be largely impacted by controlled water level in the SFWMD Ocean Canal running parallel along the north side the project corridor.

Groundwater levels were reported in each of the borings. Based on our experience, water levels encountered in the test borings may not have sufficient time to achieve equilibrium prior to reading measurements. Therefore, groundwater levels encountered in the field during construction may be higher (or lower) than that indicated on the test boring logs. Fluctuation should be anticipated due to environmental variation and seasonal condition, such as the frequency and magnitude of rainfall patterns, as well as man-made influences, such as existing canals, swales, drainage ponds, and under drains. We recommend that the contractors determine the actual groundwater levels prior to the time of the construction to evaluate groundwater impact on their construction procedure.

7.0 ROADWAY EMBANKMENT EVALUATION

The findings of field and laboratory analytical data for this study indicate that the roadway alignment is generally suitable for the planned construction when viewed from a geotechnical engineering perspective. The subsurface conditions of the roadway alignment will impose some constraints or limitations on the design or construction of the planned project from a soil mechanics, foundation engineering or engineering geology standpoint. The position of the groundwater table must also be generally considered during final design phase and construction.

The majority of the project corridor is underlain with interlayering of Strata 1A, 1, 2, 3, 4, 5 and 5A soils.

Stratum 1 (base material) consists of select material and are adequate for subgrade and embankment support. However, portions have high fine content (average fines content 24.7%) and are likely to retain some excess moisture and could be difficult to handle, place and compact compared to ordinary A-3 materials.

Stratum 3 and 4 consist of Limestone. Specialized tools and equipment are necessary to excavate and/or penetrate the limestone layer.

Stratum 5 soils are silty soils with average fines content 21.6%. These soils due to high fines content are likely to retain excess moisture and could be difficult to handle, place and compact. A-2-4 material placed below the existing water level must contain less than 15% passing the No. 200 U.S. Standard sieve. These soils may be used in the roadway subgrade with extra caution, and proper supervision and quality control. However, the District Materials Engineer (along with the CEI team) has the authority to approve or disapprove the use of these soils based on existing site conditions during construction and efficiency of the contractor's means and methods for handling these soils.

Stratum 5A soils are silt material with average fines content 49.7%. These soils due to high fines content are likely to retain excess moisture and could be difficult to handle, place and compact. These A-4 material need to be removed to 2 feet below base and replaced with embankment fill, as per FDOT Standard Plans Index 120-002. However, based on existing roadway grades and proposed improvements, removal of this A-4 soil layer will not be necessary.

Stratum 5B and 5C consist of select material and are adequate for subgrade and embankment support, and should be utilized according to Standard Plans, Index 120-001.

Stratum 2 consists of organic soils classified as A-8 materials. These soils are found along the project corridor with average organic content 62.4%. We understand that the proposed improvements include mainly milling and resurfacing of the corridor with widening being proposed along CR-880 corridor. As per FDOT Standard Plans Index 120-002, these soils need to be removed and replaced with select embankment fill. However, we believe that based on the proposed project corridor improvement; and the location, extent, depth, and organic content of these soils; removal and replacement of the organic soils with select fill materials may not be a feasible option applicable to these locations.

We performed sixty-seven (67) muck probes to determine the limit and thickness of muck at toe of existing embankment along the south side of roadway corridor. The details are present in Table – 6.

We understand that the organic soils will not be removed and rigid inclusions will be performed along the project corridor. The detail of analysis of rigid inclusions is present in the next section.

The recommendations of handling of each soil layer (Stratum 1 through 5C) are presented in Figure RSS - 1, Cross Section Soil Survey for the Design of Roads.

8.0 GEOTECHNICAL EVALUATION

8.1 General

The proposed project is considering to widen the roadway to the south of it. Based on the information obtained from our geotechnical exploration, peat exists within the embankment and gradually to the south of it (toe of existing embankment slope). The peat is weak and its

compressibility must be accounted for in the project design and construction.

We believe Palm Beach County has completed a geotechnical study for about 19 miles along County Road (CR) 880. The study limits of the roadway is located between Main Street in Belle Glade and State Road (SR) 80. The purpose of the study was to evaluate the option of mitigating the effect of the existing organic (muck) soils in reference to the proposed improvement / widening. Based on the study, various options were evaluated and the most feasible option 'Rigid Inclusion' was recommended.

This project site is along CR 880, for a length of about 4200 feet and is part of the study corridor. We understand Palm Beach County's decision to utilize the concept of rigid inclusion along this small corridor, and evaluate the effect and performance of the recommended alternative.

The following section provides a discussion of anticipated roadway settlement if the peat layer is left in place and the proposed widening are designed with Rigid Inclusion.

8.2 Roadway Widening Over Existing Peat With Rigid Inclusion

This option will treat the peat layer beneath the 15 ft wide extension using Rigid Inclusions. This consists of inserting shallow unreinforced concrete "piles" on a grid pattern through the peat. We anticipate that the inclusions would be installed to a depth of 20 feet below working grade and on a center to center spacing of about 6 ft (conservative), with three rows of inclusions beneath the widening. A relieving platform [Load Transfer Platform (LTP)] consisting of granular fill with 2 layers of geogrid reinforcement would be constructed over the rigid inclusions. We anticipate that this LTP would be about 2 ft (minimum) thick and would exist between the bottom of the base course and the top of the inclusions. Please note the system described is conceptual after discussion with an experienced specialty contractor with experience in performing rigid inclusion. The actual design would need to be completed by the specialty contractor's engineer.

We estimated the settlement under the roadway widening if the organic soils (muck) is left in place. The settlement estimates were performed for one (1) typical section (with maximum length) assuming the road is widening to south / right side for approximate 15 feet. The organic soils (muck) layer under the existing embankment and widening portion is conservatively estimated to 10 feet thick in the settlement analysis. The consolidation lab data from three Shelby tube samples are analyzed respectively. The settlement analysis is performed using FoSSA 2.0 program.

The settlement at the center of existing roadway embankment, and the settlement at the center of the widening section, are analyzed. The settlement analysis is performed as following:

- i. The muck layer below existing roadway and slope (proposed roadway) was conservatively estimated to be 10 feet.
- ii. A representative subsurface soil stratum was chosen based on all borings detailed and shown on Sheet B-1 in Appendix – B.
- iii. For the loading, we used a 3 feet pavement section and traffic loading of 250 psf.
- iv. Settlement was calculated at two (2) points, as mentioned above.
- v. Consolidation test results from all three (3) tests were used for the calculation.

The summary of settlement analysis is presented in Table – B1, and the details of analysis (including FoSSA outputs) are presented in Appendix – B. The estimates of settlement include compression of the granular soils and primary consolidation of the peat and do not include long term secondary compression (which is estimated to be about 1 to 2 inches over 20 years).

The results indicate that the settlement at the center of existing roadway embankment will be minimal. Please note, the settlement shown at the center of the existing roadway is between 2.5 and 4 inches. Most of this settlement has already occurred. There will be minor settlement due to the additional embankment widening. However, the settlement of the widening section varies between 2 to 4 inches. We understand Rigid Inclusion will help to mitigate this settlement.

In reference to our meeting with a specialty contractor with experience in designing and installing Rigid Inclusion, the conservative cost of Rigid Inclusion will be \$25 to \$28 / sq. ft with 20 feet depth with 6 feet grid. Assuming a length of 4200 feet with 15 feet of widening, the total anticipated cost for Rigid Inclusion will be approximately \$ 1.6 to \$1.8 million.

9.0 GEOTECHNICAL RECOMMENDATIONS

We understand that the recommended option appears to be widening the existing CR 880 roadway after installing rigid inclusions through the peat, as 3 rows of 20 ft deep rigid inclusions that penetrate through the peat beneath the widening area. The actual design of the rigid inclusions system would need to be performed by a specialty contractor. Also, this alternative has some risk of long term settlement beneath the existing roadway footprint (and differential settlement) as the underlying peat just north of the rigid inclusions continues to undergo long term compression but the widened area above the inclusions remains relatively still. For this reason, periodic asphalt concrete overlays may be needed to reestablish grade and/or appropriate roadway cross slopes for drainage.

10.0 LIMITATIONS OF STUDY

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein are preliminary and have been presented after being prepared following generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics and engineering geology. This company is not responsible for the conclusion, opinion, or recommendations made by others based on this data. No other warranties are expressed or implied.

This report is prepared based on information received from your office via telephone conversations and emails and are mentioned in the report. If any of this information is not correct, or if the location of the proposed structure is changed, or if the loads or foundation type change, please contact us so that the recommendation provided in the report may be reviewed for continued applicability.

The scope of the investigation was intended to evaluate soil conditions within the influence of foundations and does not include an evaluation of potential deep soil problems such as sinkholes. The analysis and recommendations submitted in this report are based upon the data obtained

from the soil borings performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature, or location of the proposed structures.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in the report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

TABLE -1

SUMMARY OF LABORATORY TESTING RESULTS [PBC Project No. 2019803]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Sample Depth (ft)	Stratum	AASHTO Symbol	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis									
						LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200	
R-101	2.0 - 4.0	1	A-1-b	13.6				63.1	52.7	43.5	36.4	29.7	24.8	21.9	19.4	17.0		
R-101	8.0 - 10.0	2	A-8	377.3	76.2													
R-102	0.0 - 2.0	2	A-8	190.2	53.9													
R-102	2.0 - 4.0	5A	A-4	43.3				90.7	84.2	72.0	64.2	57.9	52.2	49.0	46.3	42.9		
R-103	6.0 - 8.0	2	A-8	214.9	69.4													
R-104	6.0 - 8.0	5	A-2-4	30.4				97.3	88.4	79.2	66.6	54.1	44.2	37.7	33.4	30.0		
R-105	8.0 - 10.0	2	A-8	138.9	29.8													
R-106	6.0 - 8.0	5A	A-4	33.5				100.0	98.2	93.2	84.1	73.5	64.3	57.4	52.7	48.3		
R-107	4.0 - 6.0	1	A-1-b	16.4				96.5	86.5	74.6	61.0	47.4	37.2	30.7	23.1	17.2		
R-108	2.0 - 4.0	2	A-8	209.4	56.8													
R-108	8.0 - 10.0	5C	A-1-b	27.1				100.0	95.4	79.1	60.9	47.9	37.9	30.0	20.1	11.9		
R-109	8.0 - 10.0	2	A-8	176.4	61.1													
R-110	2.0 - 4.0	5	A-2-4	43.1				85.5	64.8	51.6	47.5	43.6	39.0	35.4	32.1	29.0		
R-113	6.0 - 8.0	2	A-8	396.4	83.2													
R-113	8.0 - 10.0	5A	A-4	41.6				100.0	99.4	94.8	89.2	80.6	73.3	68.9	65.0	59.2		
R-114	2.0 - 4.0	5A	A-4	39.0												60.4		
R-115	4.0 - 6.0	1	A-1-b	15.0												17.6		
R-115	8.0 - 10.0	2	A-8	303.6	81.1													
R-117	2.0 - 4.0	1	A-1-b	11.9												24.6		
R-117	6.0 - 8.0	2	A-8	225.7	74.6													
R-118	2.0 - 4.0	2	A-8	25.1	13.5													
R-119	7.0 - 8.0	2	A-8	17.7	6.1													
R-119	8.0 - 10.0	5A	A-4	45.8												60.0		
R-121	6.0 - 8.0	2	A-8	388.7	89.3													
R-201	4.0 - 6.0	5A	A-4	15.5												40.1		
R-201	8.0 - 10.0	2	A-8	373.4	82.1													
R-202	2.0 - 4.0	1	A-2-4	11.5				96.6	96.6	92.9	85.8	78.2	69.7	58.9	48.6	34.4		

SSP-129D

SUPPLEMENTAL SPECIAL PROVISIONS

TABLE -1

SUMMARY OF LABORATORY TESTING RESULTS [PBC Project No. 2019803]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Sample Depth (ft)		Stratum	AASHTO Symbol	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis												
							LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200				
R-202	4.3	- 6.0	2	A-8	62.6	19.9																
R-203	2.0	- 4.0	1	A-2-4	14.7																	33.8
R-203	6.5	- 8.0	2	A-8	129.2	69.1																
R-301	6.0	- 8.0	5A	A-4	34.0					100.0	98.9	98.0	94.2	82.5	68.3	58.6	53.3	49.1				
R-302	2.0	- 4.0	2	A-8	184.0	39.0																
R-302	8.0	- 10.0	5	A-2-4	28.5					100.0	95.5	86.3	77.0	65.8	56.0	48.0	42.3	35.2				
R-302	18.0	- 20.0	5	A-2-4	19.8					100.0	95.0	86.9	71.6	59.0	51.5	46.5	32.1	19.5				
R-303	8.0	- 10.0	5	A-1-b	25.9					100.0	88.8	76.7	62.4	49.7	38.5	29.7	20.5	13.3				
R-304	7.0	- 8.0	2	A-8	162.8	75.6																
R-304	18.0	- 20.0	5A	A-4	27.1					100.0	100.0	96.5	88.2	71.9	62.4	58.9	54.4	48.3				
R-305	4.0	- 6.0	5A	A-4	62.8					96.1	94.9	90.1	84.2	76.3	69.4	64.9	61.6	58.2				
R-305	12.0	- 13.5	5	A-1-b	20.0					100.0	90.4	79.7	67.4	56.7	49.6	43.6	31.3	17.4				
R-306	6.0	- 8.0	5A	A-4	35.0					100.0	98.1	89.7	76.5	62.0	51.5	45.0	40.6	37.2				
R-306	8.0	- 10.0	5	A-2-4	33.4					100.0	98.9	96.1	90.6	76.5	53.1	31.1	18.3	11.8				
PC-1	8.0	- 10.0	2	A-8	367.1	82.8																
PC-1	13.5	- 15.0	5A	A-4	41.4					100.0	96.7	89.0	80.4	70.6	62.8	58.5	55.3	51.9				
PC-2	4.0	- 6.0	2	A-8	336.9	83.3																
PC-3	4.0	- 6.0	1	A-2-4	16.8					94.5	88.6	79.3	68.5	57.4	48.9	42.6	35.2	28.2				
PC-4	10.0	- 12.0	2	A-8	236.2	50.6																
PC-4	12.0	- 13.5	5A	A-4	30.0					96.5	89.5	81.2	71.6	62.7	54.6	48.7	44.7	40.2				
PC-5	5.0	- 6.0	2	A-8	306.2	86.9																
PC-5	12.0	- 13.5	5	A-1-b	39.9					100.0	98.5	93.1	84.9	67.7	48.4	30.8	21.8	16.3				
PC-6	6.0	- 8.0	2	A-8	426.3	89.2																

SSP-129D

TABLE -1

SUMMARY OF LABORATORY TESTING RESULTS [PBC Project No. 2019803] [STARTUM 1]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Sample Depth (ft)	Stratum	AASHTO Symbol	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis									
						LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200	
R-101	2.0 - 4.0	1	A-1-b	13.6					63.1	52.7	43.5	36.4	29.7	24.8	21.9	19.4		17.0
R-107	4.0 - 6.0	1	A-1-b	16.4					96.5	86.5	74.6	61.0	47.4	37.2	30.7	23.1		17.2
R-115	4.0 - 6.0	1	A-1-b	15.0														17.6
R-117	2.0 - 4.0	1	A-1-b	11.9														24.6
R-202	2.0 - 4.0	1	A-2-4	11.5					96.6	96.6	92.9	85.8	78.2	69.7	58.9	48.6		34.4
R-203	2.0 - 4.0	1	A-2-4	14.7														33.8
PC-3	4.0 - 6.0	1	A-2-4	16.8					94.5	88.6	79.3	68.5	57.4	48.9	42.6	35.2		28.2

TABLE -1

SUMMARY OF LABORATORY TESTING RESULTS [PBC Project No. 2019803] [STARTUM 2]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Sample Depth (ft)		Stratum	AASHTO Symbol	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
							LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

SSP-131D

TABLE -1

SUMMARY OF LABORATORY TESTING RESULTS [PBC Project No. 2019803] [STARTUM 5]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Sample Depth (ft)	Stratum	AASHTO Symbol	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis									
						LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200	
R-104	6.0 - 8.0	5	A-2-4	30.4				97.3	88.4	79.2	66.6	54.1	44.2	37.7	33.4			30.0
R-110	2.0 - 4.0	5	A-2-4	43.1				85.5	64.8	51.6	47.5	43.6	39.0	35.4	32.1			29.0
R-302	8.0 - 10.0	5	A-2-4	28.5				100.0	95.5	86.3	77.0	65.8	56.0	48.0	42.3			35.2
R-302	18.0 - 20.0	5	A-2-4	19.8				100.0	95.0	86.9	71.6	59.0	51.5	46.5	32.1			19.5
R-303	8.0 - 10.0	5	A-1-b	25.9				100.0	88.8	76.7	62.4	49.7	38.5	29.7	20.5			13.3
R-305	12.0 - 13.5	5	A-1-b	20.0				100.0	90.4	79.7	67.4	56.7	49.6	43.6	31.3			17.4
R-306	8.0 - 10.0	5	A-2-4	33.4				100.0	98.9	96.1	90.6	76.5	53.1	31.1	18.3			11.8
PC-5	12.0 - 13.5	5	A-1-b	39.9				100.0	98.5	93.1	84.9	67.7	48.4	30.8	21.8			16.3

TABLE -1

SUMMARY OF LABORATORY TESTING RESULTS [PBC Project No. 2019803] [STARTUM 5A]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Sample Depth (ft)	Stratum	AASHTO Symbol	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis									
						LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200	
R-102	2.0 - 4.0	5A	A-4	43.3				90.7	84.2	72.0	64.2	57.9	52.2	49.0	46.3			42.9
R-106	6.0 - 8.0	5A	A-4	33.5				100.0	98.2	93.2	84.1	73.5	64.3	57.4	52.7			48.5
R-113	8.0 - 10.0	5A	A-4	41.6				100.0	99.4	94.8	89.2	80.6	73.3	68.9	65.0			59.2
R-114	2.0 - 4.0	5A	A-4	39.0														60.4
R-119	8.0 - 10.0	5A	A-4	45.8														60.0
R-201	4.0 - 6.0	5A	A-4	15.5														40.1
R-301	6.0 - 8.0	5A	A-4	34.0				100.0	98.9	98.0	94.2	82.5	68.3	58.6	53.3			49.1
R-304	18.0 - 20.0	5A	A-4	27.1				100.0	100.0	96.5	88.2	71.9	62.4	58.9	54.4			48.3
R-305	4.0 - 6.0	5A	A-4	62.8				96.1	94.9	90.1	84.2	76.3	69.4	64.9	61.6			58.2
R-306	6.0 - 8.0	5A	A-4	35.0				100.0	98.1	89.7	76.5	62.0	51.5	45.0	40.6			37.2
PC-1	13.5 - 15.0	5A	A-4	41.4				100.0	96.7	89.0	80.4	70.6	62.8	58.5	55.3			51.9
PC-4	12.0 - 13.5	5A	A-4	30.0				96.5	89.5	81.2	71.6	62.7	54.6	48.7	44.7			40.2

SSP-133D

TABLE -1

SUMMARY OF LABORATORY TESTING RESULTS [PBC Project No. 2019803] [STARTUM 5C]

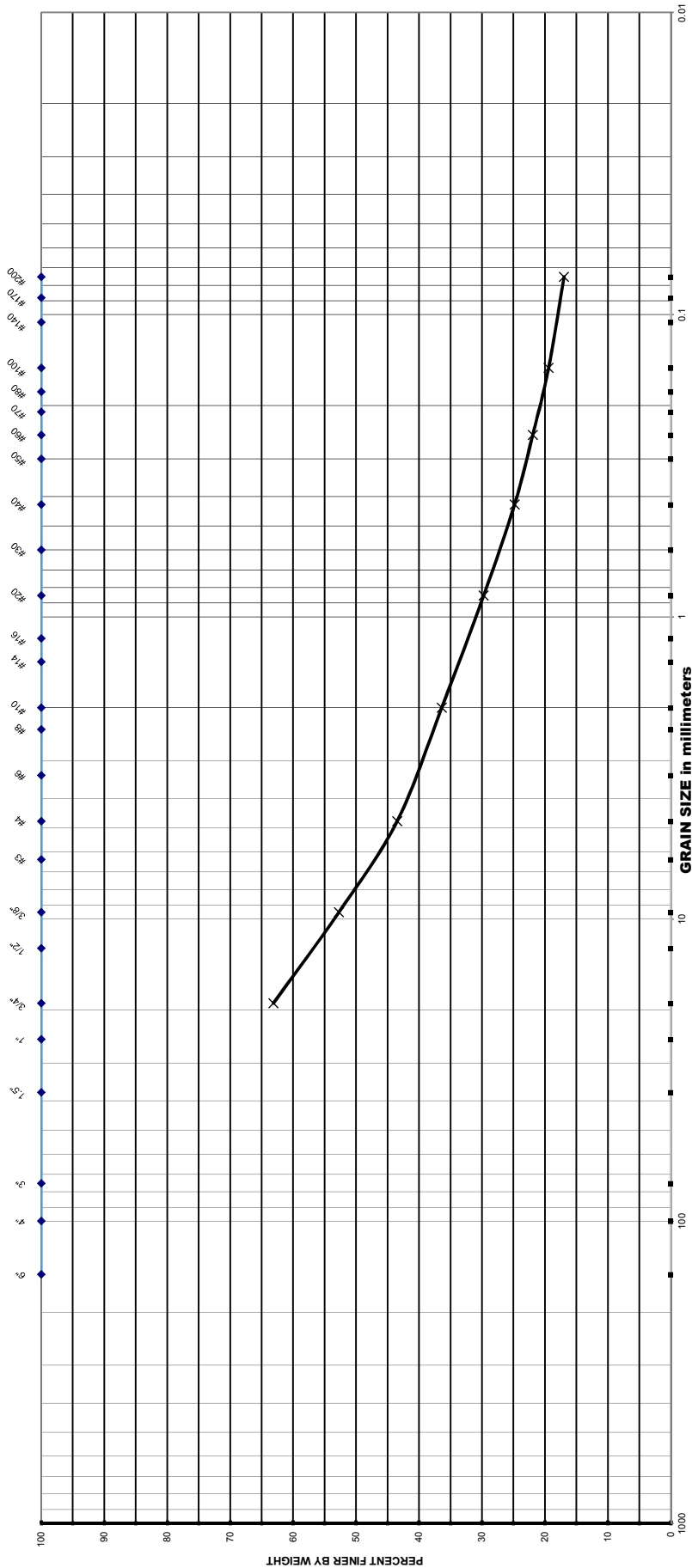
Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Sample Depth (ft)	Stratum	AASHTO Symbol	Natural Moisture Content (%)	Organic Content (%)	Atterberg Limits			Sieve Analysis									
						LL (%)	PL (%)	PI (%)	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200	
R-108	8.0 - 10.0	5C	A-1-b	27.1					100.0	95.4	79.1	60.9	47.9	37.9	30.0	20.1	11.9	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



Project Name : CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803		U.S. SIEVE NO.	CUMM. % PASSING
		3/4"	63.1
		3/8"	52.7
		#4	43.5
BORING NO. R-101	DEPTH INTERVAL [FT] 2.0 - 4.0	#10	36.4
		#20	29.7
		#40	24.8
		#60	21.9
Note : MC - Moisture Content (%) OC - Organic Content (%)		#100	19.4
		#200	17.0

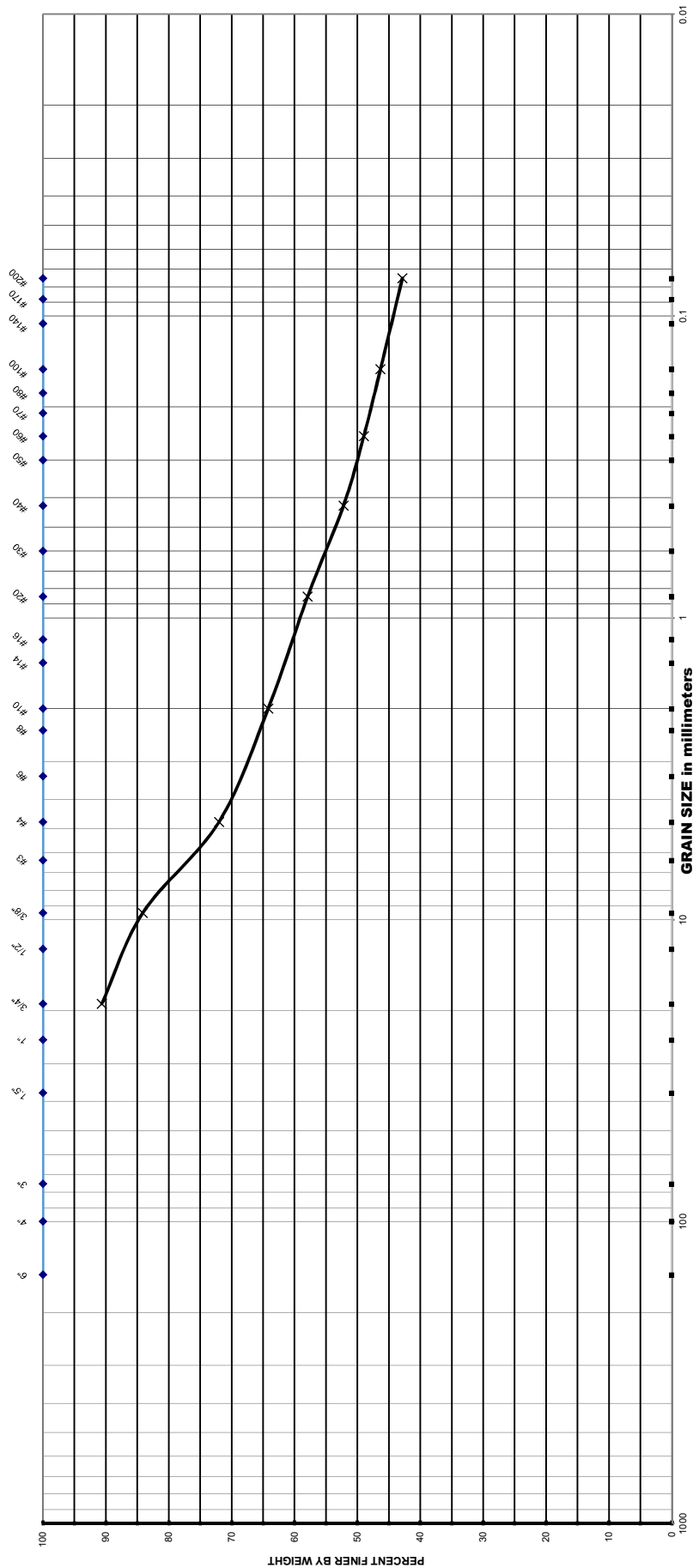
Project No. : 2000-01-21005 Date : 8/29/2022

BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	OC
R-101	2.0 - 4.0	A-1-b	13.6	

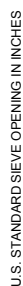
U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

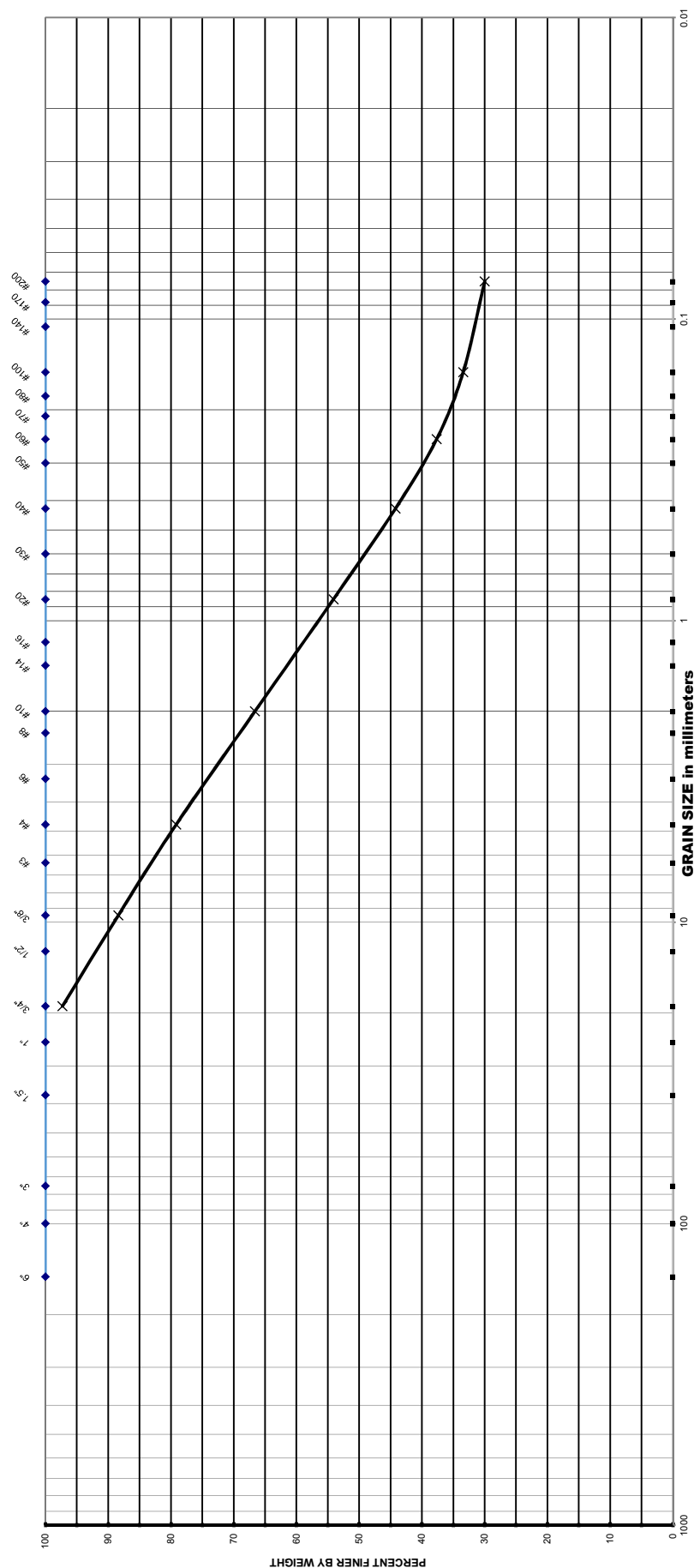


Geotechnical - Consulting - Engineering - Testing



U.S. STANDARD SIEVE NUMBERS

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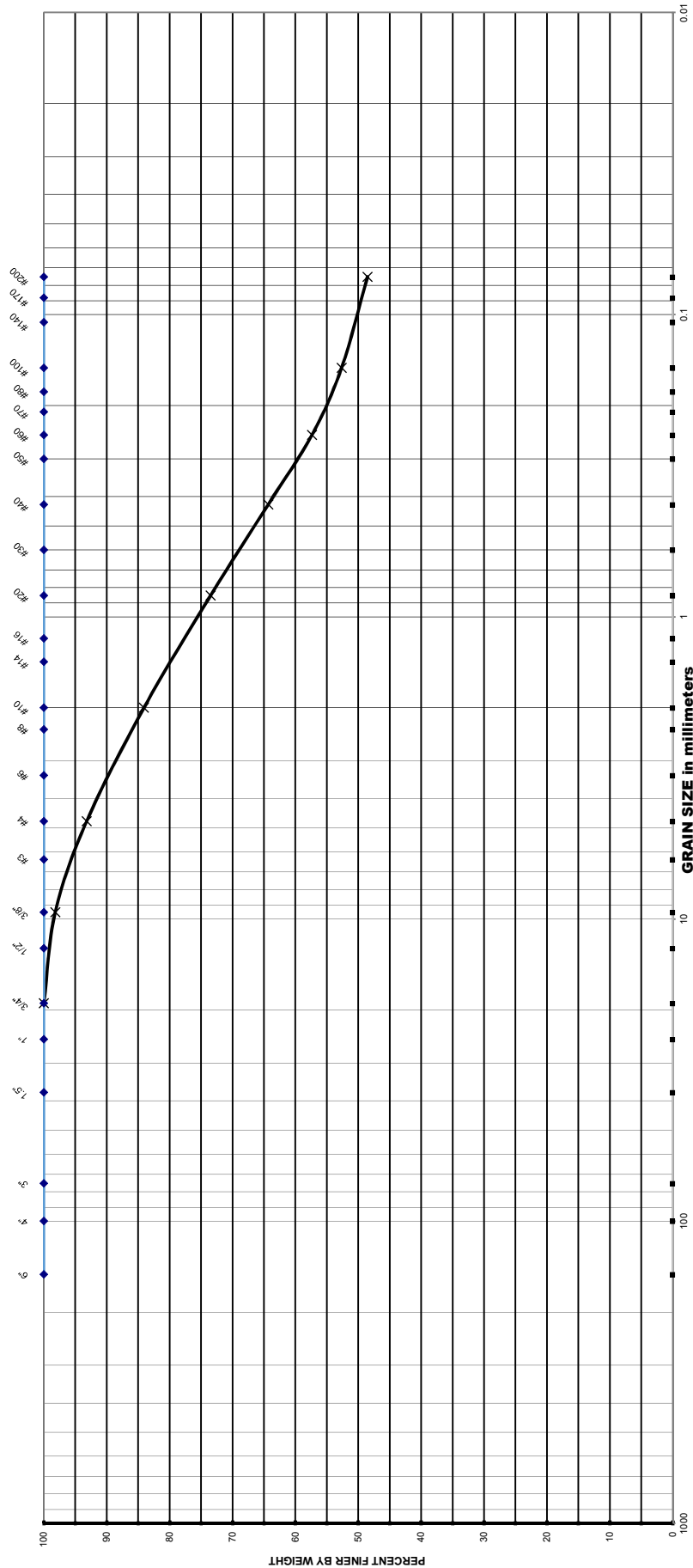


Project Name :				CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803			
Project No. :				2000-01-21005			
				Date : 8/29/2022			
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION		MC	OC	U.S SIEVE NO.	CUMM. % PASSING
R-104	6.0 - 8.0	A-2-4		30.4		#10	66.6
						#20	54.1
						#40	44.2
						#60	37.7
				Note : MC - Moisture Content (%)			
				OC - Organic Content (%)			
						#100	33.4
						#200	30.0

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

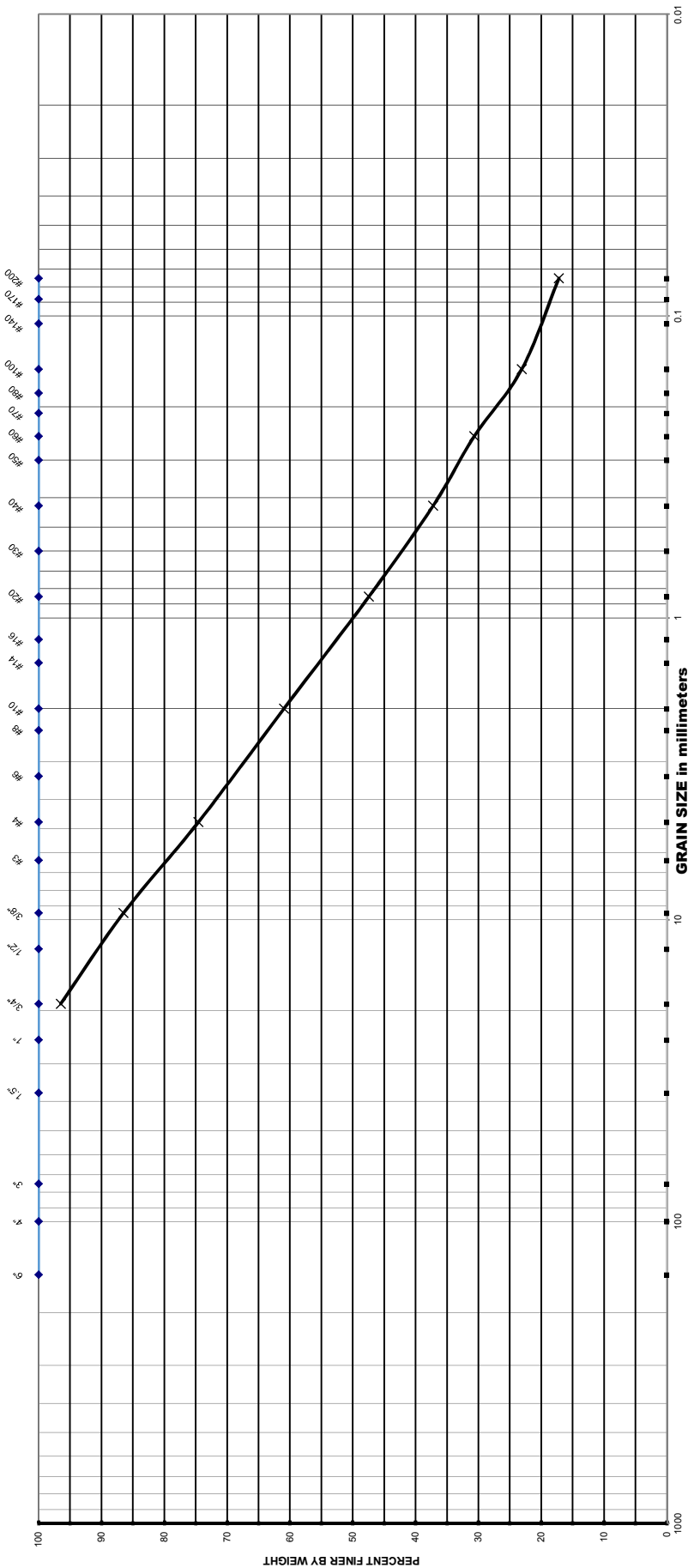


Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803]		U.S. SIEVE NO.	CUMM. % PASSING
Project No. :		2000-01-21005		3/4"	100.0
		Date : 8/30/2022		3/8"	98.2
				#4	93.2
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	#10	84.1
R-106	6.0 - 8.0	A-4	33.5	#20	73.5
				#40	64.3
				#60	57.4
			Note : MC - Moisture Content (%)		
			OC - Organic Content (%)		
			#100	52.7	
			#200	48.5	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

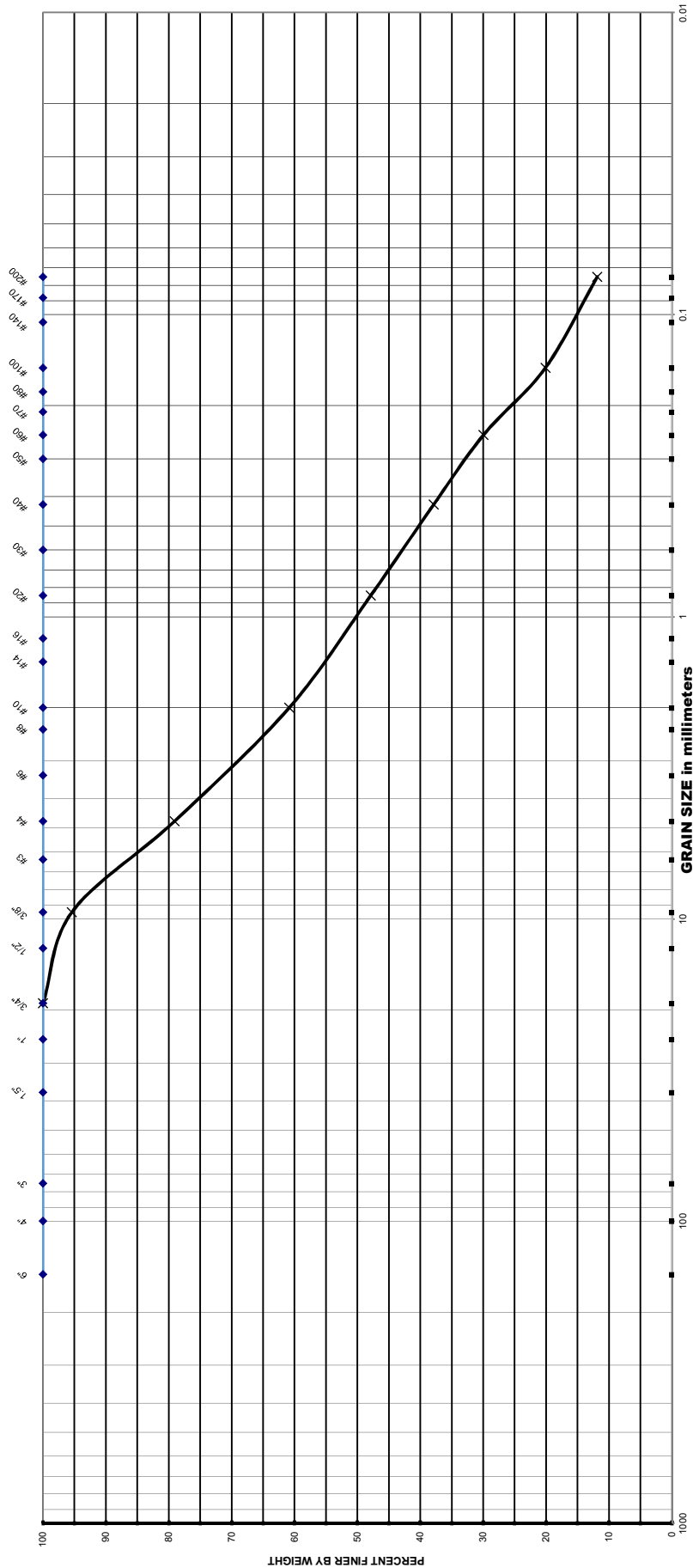


Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal [PBC Project No. 2019803]		U.S. SIEVE NO.	CUMM. % PASSING
Project No. :		2000-01-21005		3/4"	96.5
		Date : 8/30/2022		3/8"	86.5
				#4	74.6
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	#10	61.0
R-107	4.0 - 6.0	A-1-b	16.4	#20	47.4
				#40	37.2
				#60	30.7
			Note : MC - Moisture Content (%)		
			OC - Organic Content (%)		
			#100	23.1	
			#200	17.2	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

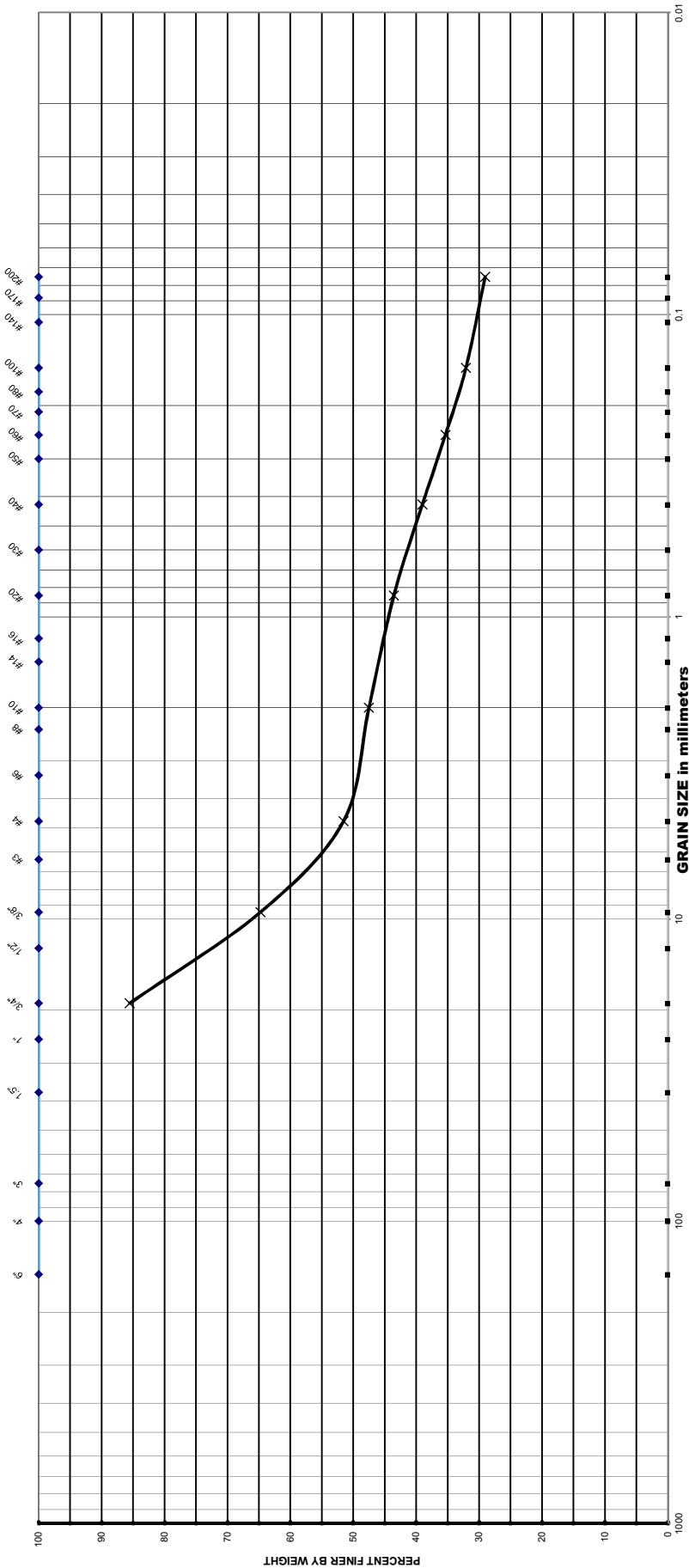
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U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

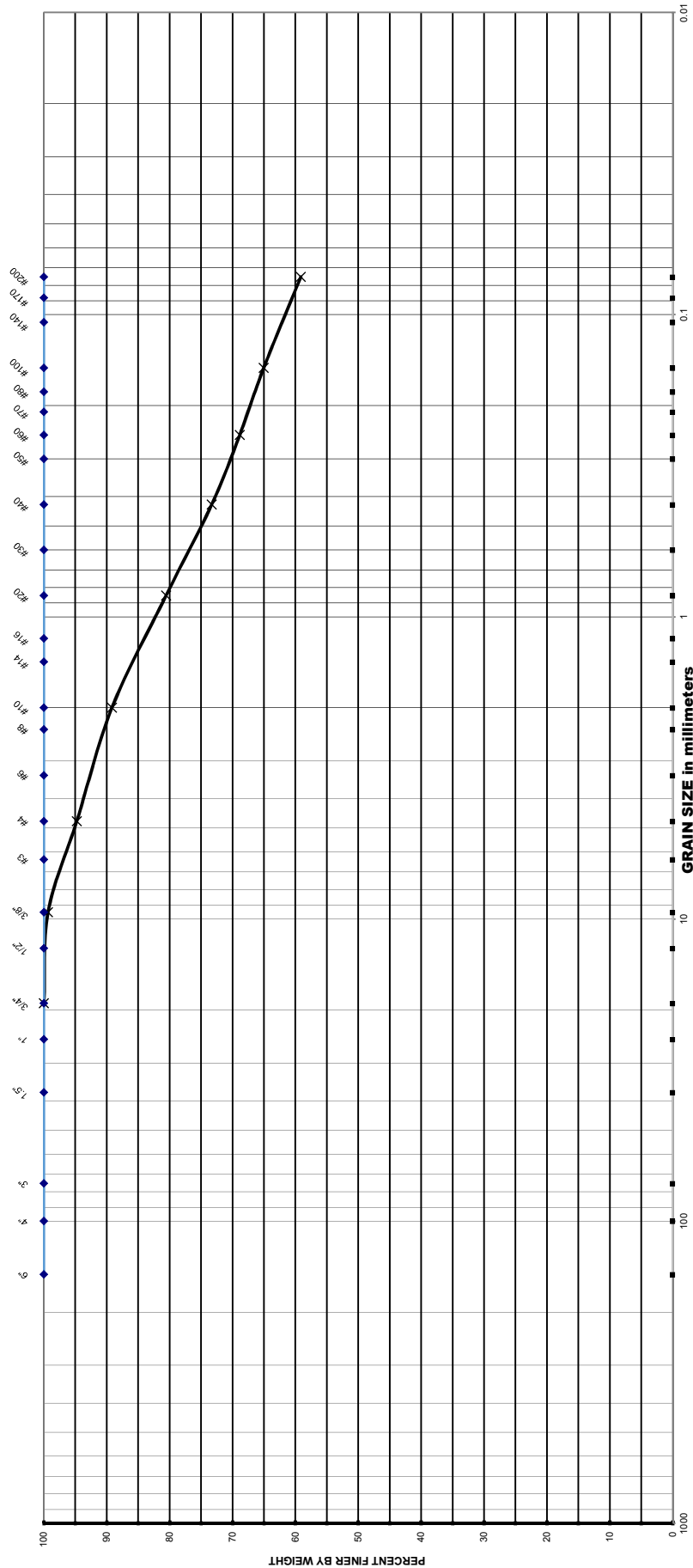
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U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

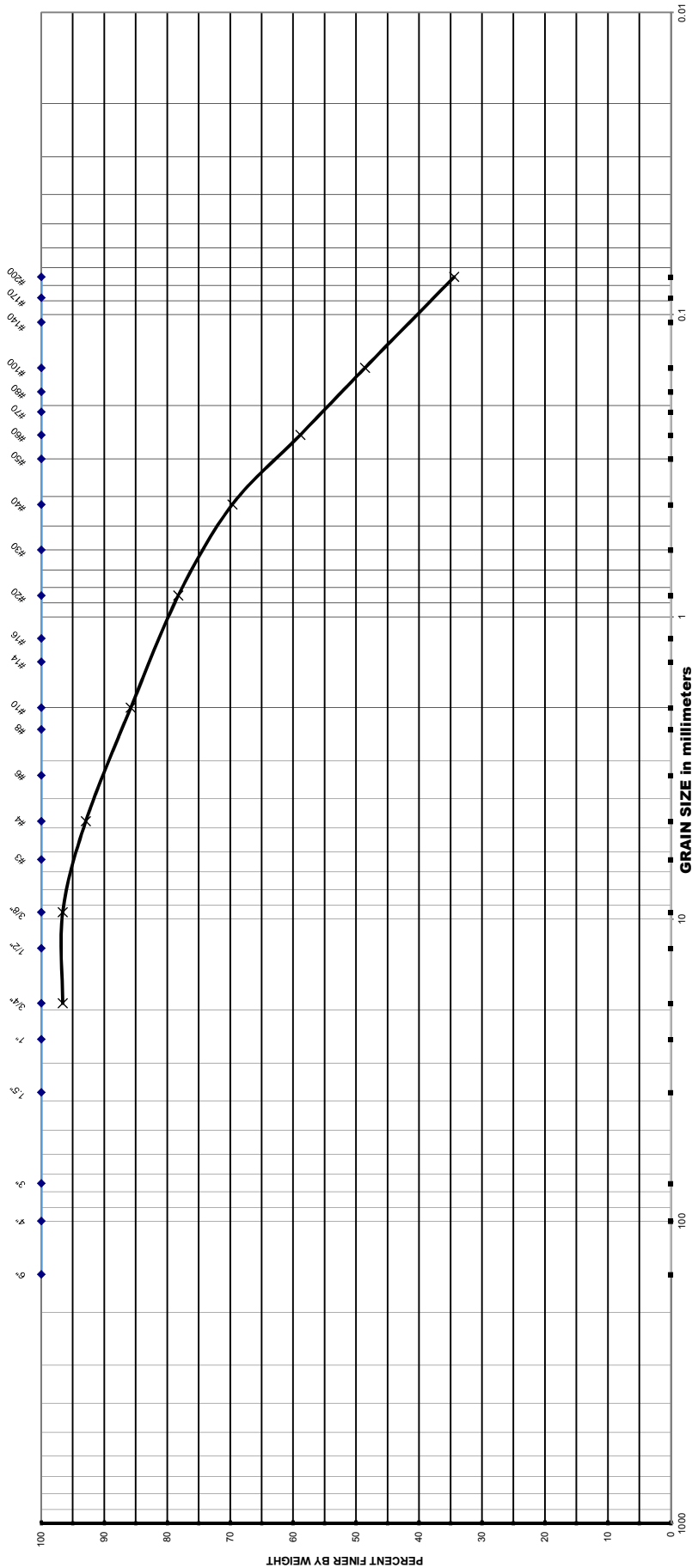
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U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

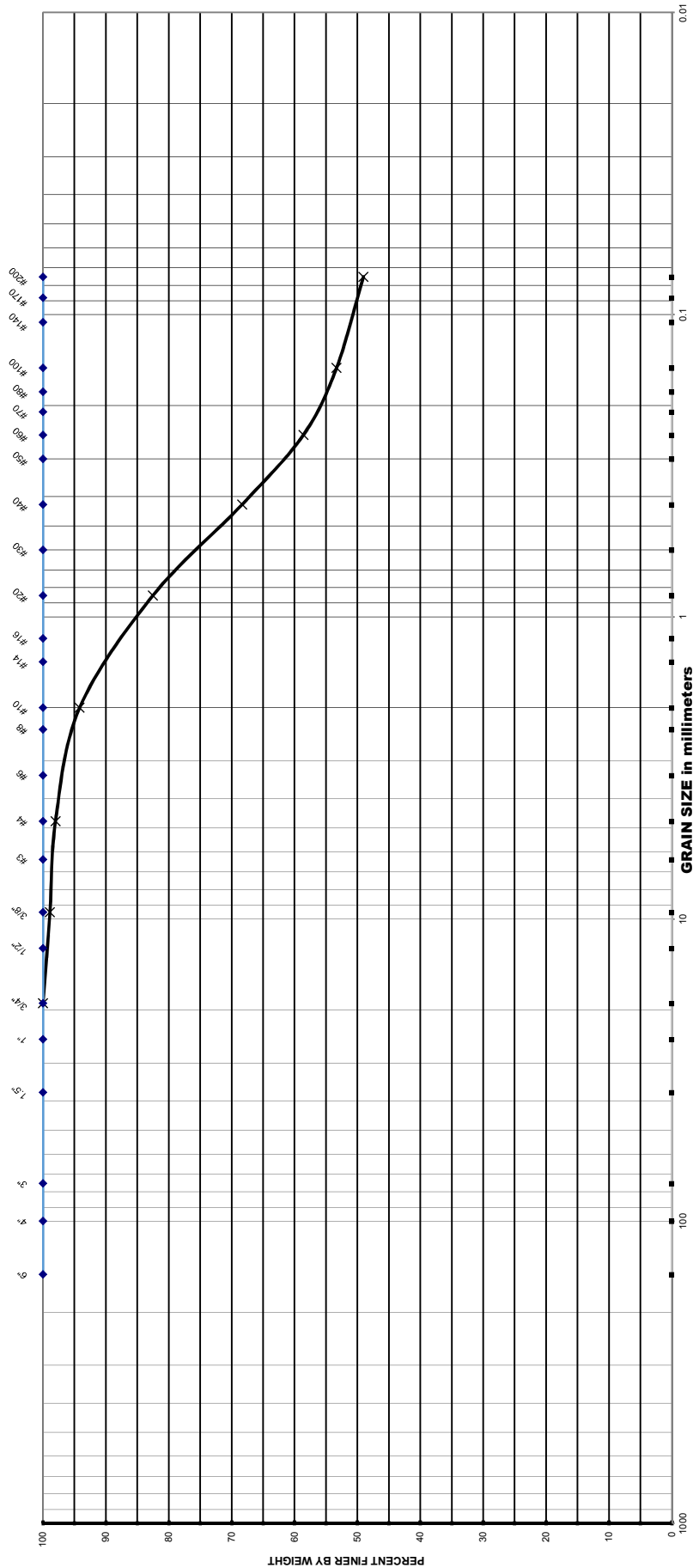
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U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

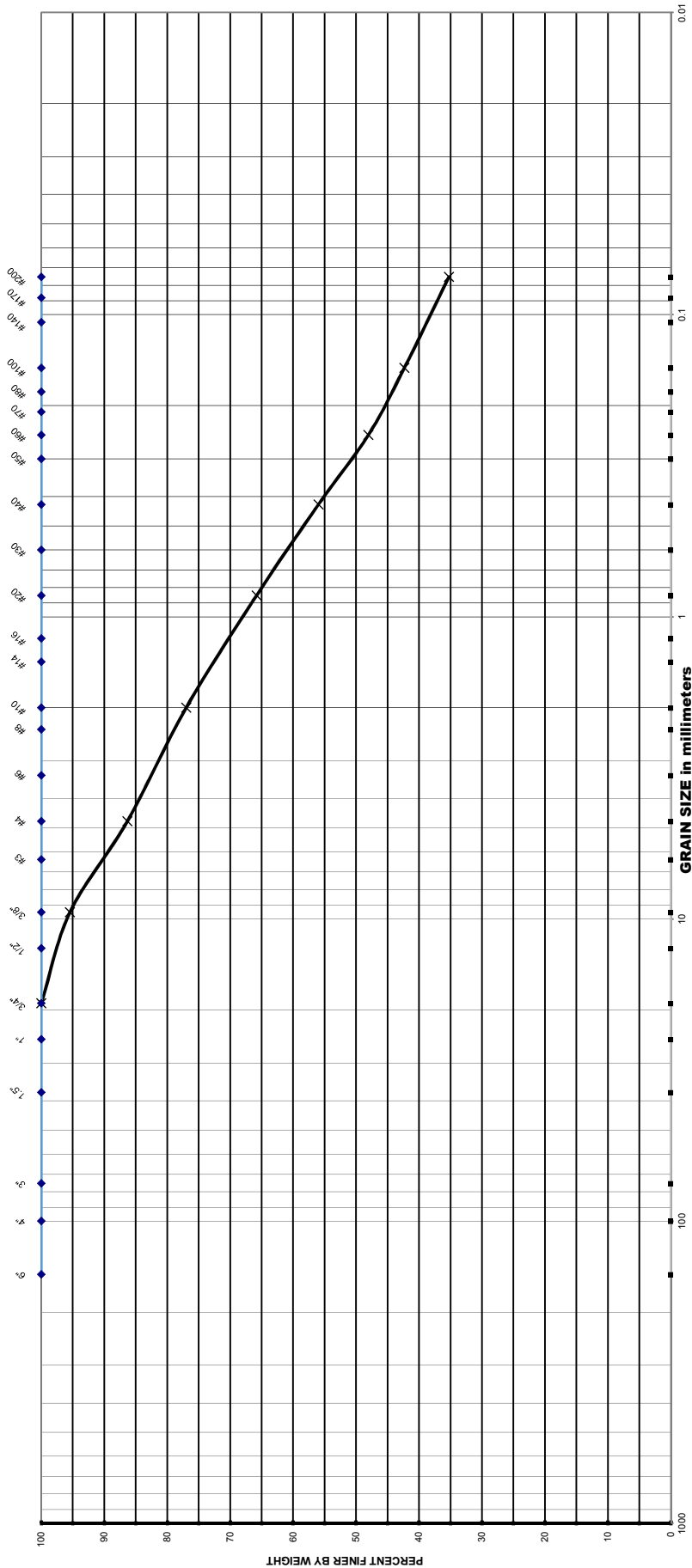
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U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

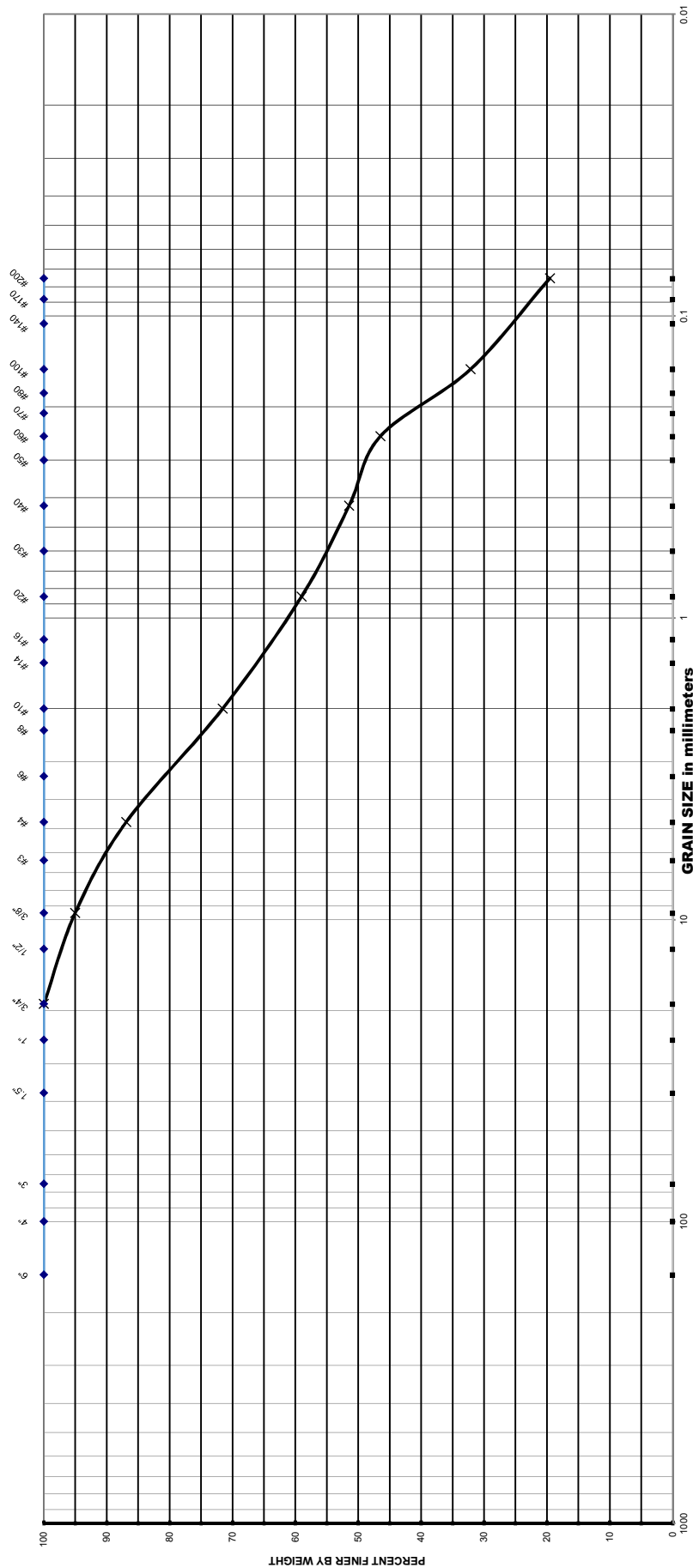


Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803]		U.S. SIEVE NO.	CUMM. % PASSING
Project No. :		2000-01-21005		3/4"	100.0
		Date : 8/30/2022		3/8"	95.5
				#4	86.3
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	#10	77.0
R-302	8.0 - 10.0	A-2-4	28.5	#20	65.8
				#40	56.0
				#60	48.0
			Note : MC - Moisture Content (%)		
			OC - Organic Content (%)		
			#100	42.3	
			#200	35.2	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

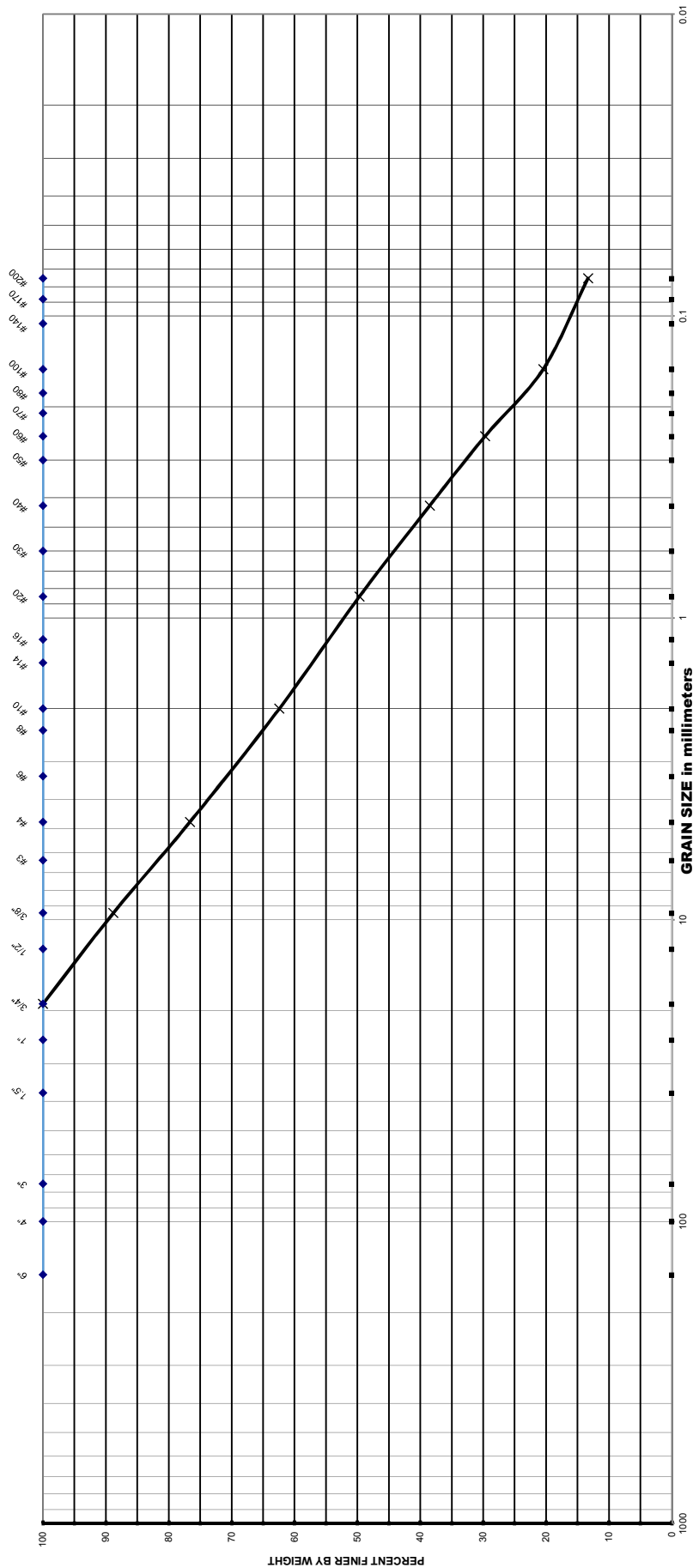
HYDROMETER



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

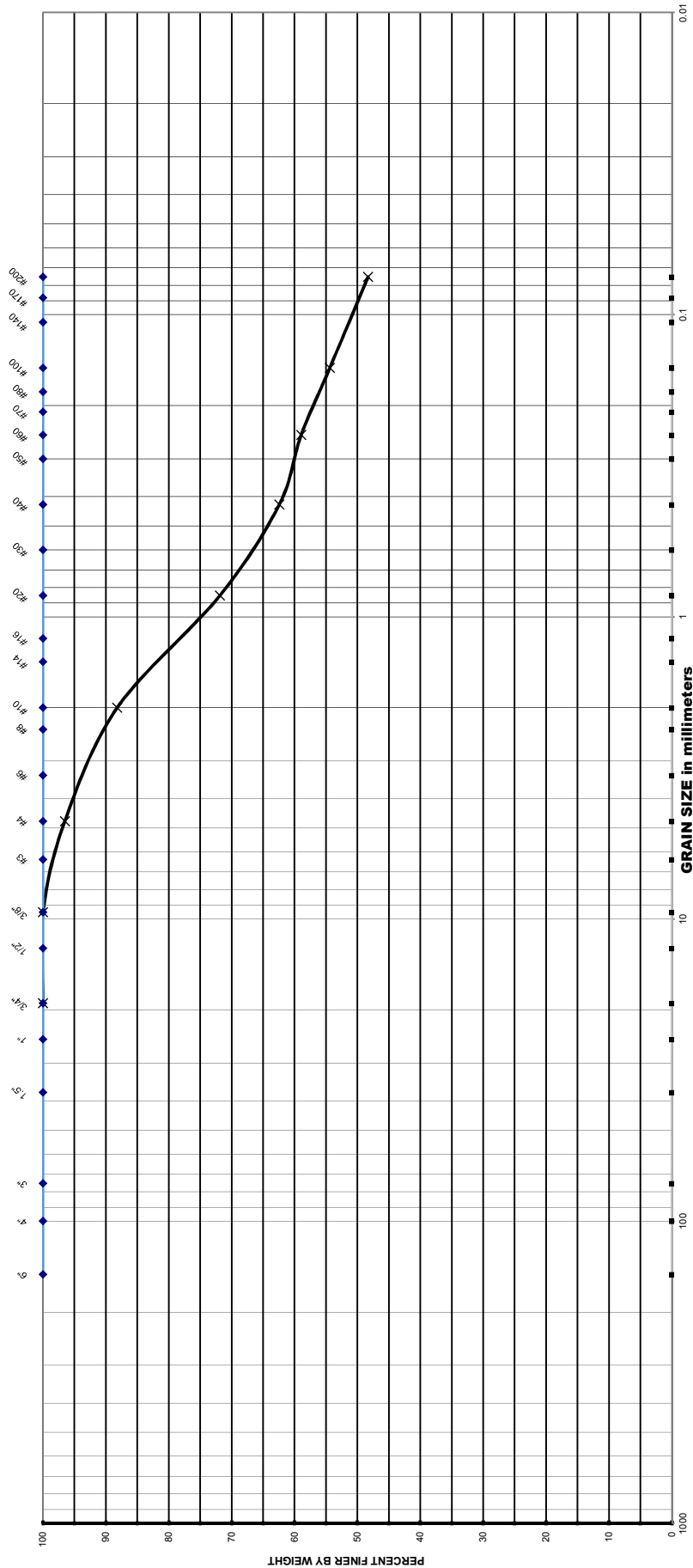


Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803]		U.S. SIEVE NO.	CUMM. % PASSING
Project No. :		2000-01-21005		3/4"	100.0
		Date : 8/30/2022		3/8"	88.8
				#4	76.7
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	#10	62.4
R-303	8.0 - 10.0	A-1-b	25.9	#20	49.7
				#40	38.5
				#60	29.7
			Note : MC - Moisture Content (%)		
			OC - Organic Content (%)		
			#100	20.5	
			#200	13.3	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

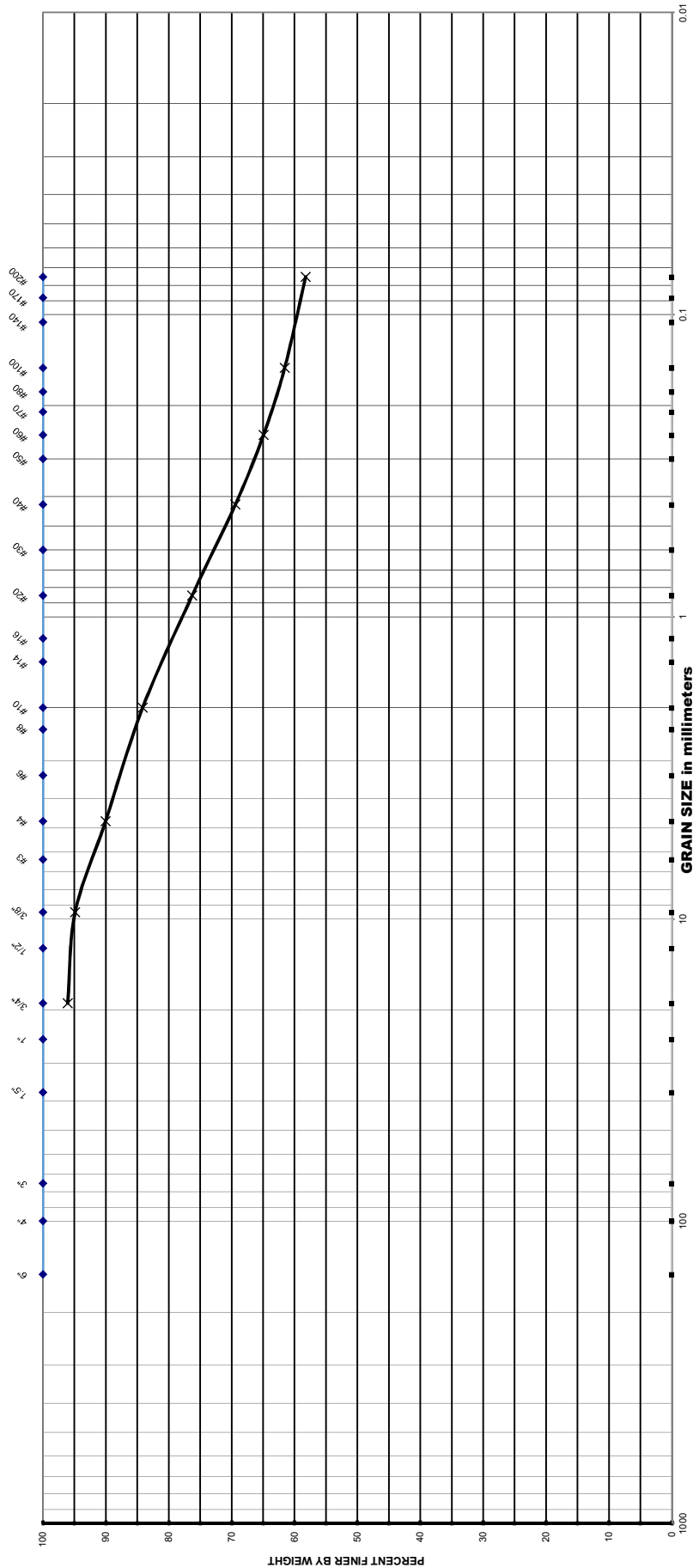


Project Name :				CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803]				U.S SIEVE NO.	CUMM. % PASSING	
Project No. :				2000-01-21005				3/4"	100.0	
				Date :				3/8"	100.0	
								#4	96.5	
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION			MC	OC	#10	88.2		
R-304	18.0 - 20.0	A-4			27.1		#20	71.9		
							#40	62.4		
							#60	58.9		
				Note : MC - Moisture Content (%)					#100	54.4
				OC - Organic Content (%)					#200	48.3

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

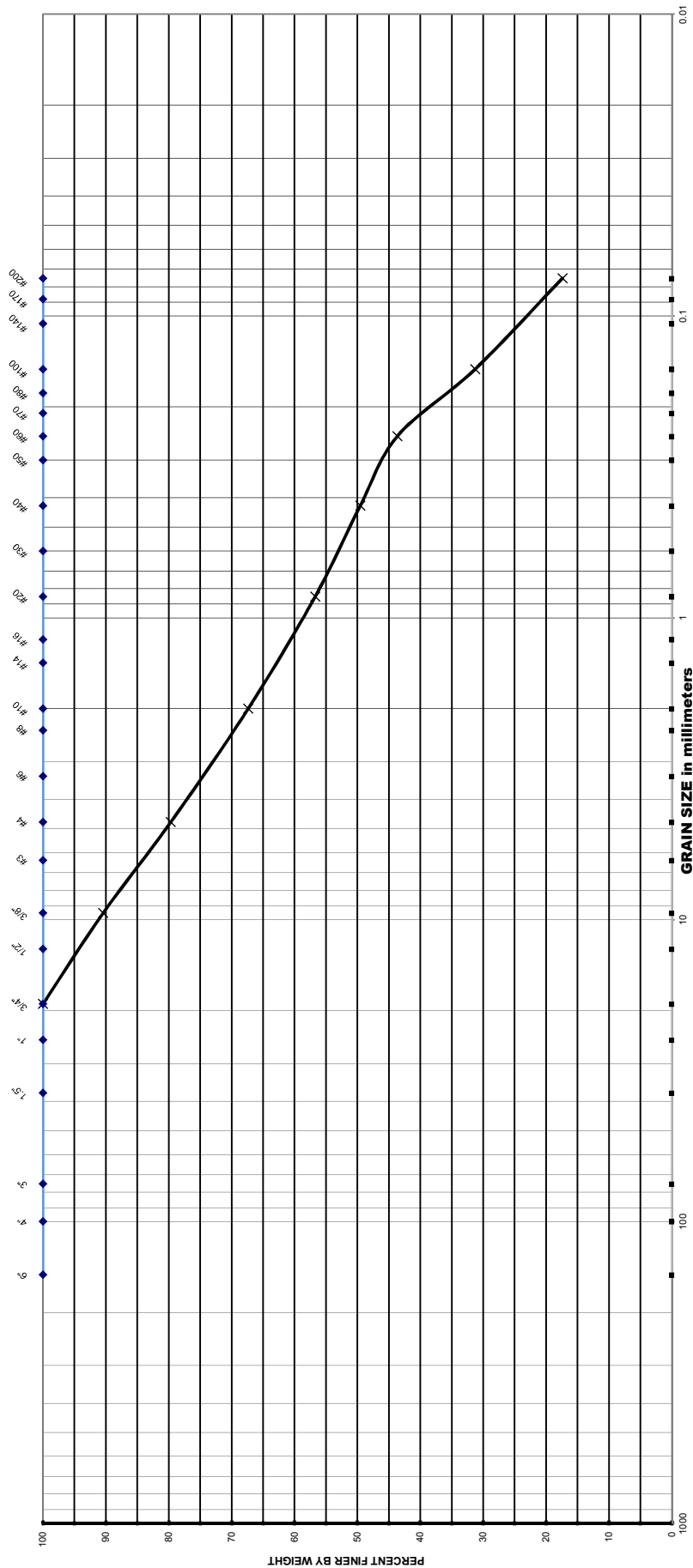


Project Name :				CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803				U.S SIEVE NO.	CUMM. % PASSING	
Project No. :				2000-01-21005				3/4"	96.1	
				Date :				3/8"	94.9	
								#4	90.1	
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION		MC	OC		#10	84.2		
R-305	4.0 - 6.0	A-4		62.8			#20	76.3		
							#40	69.4		
							#60	64.9		
				Note : MC - Moisture Content (%)					#100	61.6
				OC - Organic Content (%)					#200	58.2

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

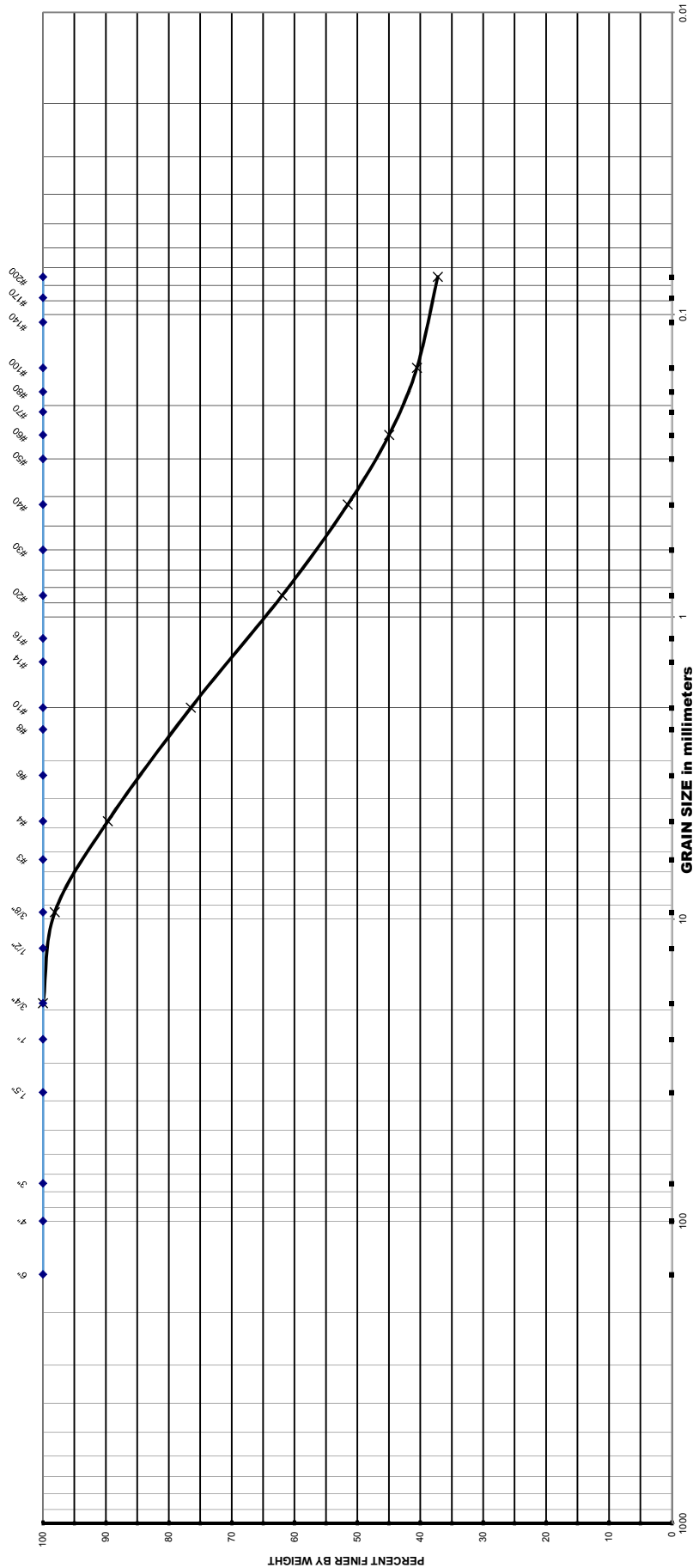


Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal [PBC Project No. 2019803]			
Project No. :		2000-01-21005		Date : 8/31/2022	
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION		MC	OC
R-305	12.0 - 13.5	A-1-b		20.0	
				Note : MC - Moisture Content (%)	
				OC - Organic Content (%)	
				#100	31.3
				#200	17.4

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

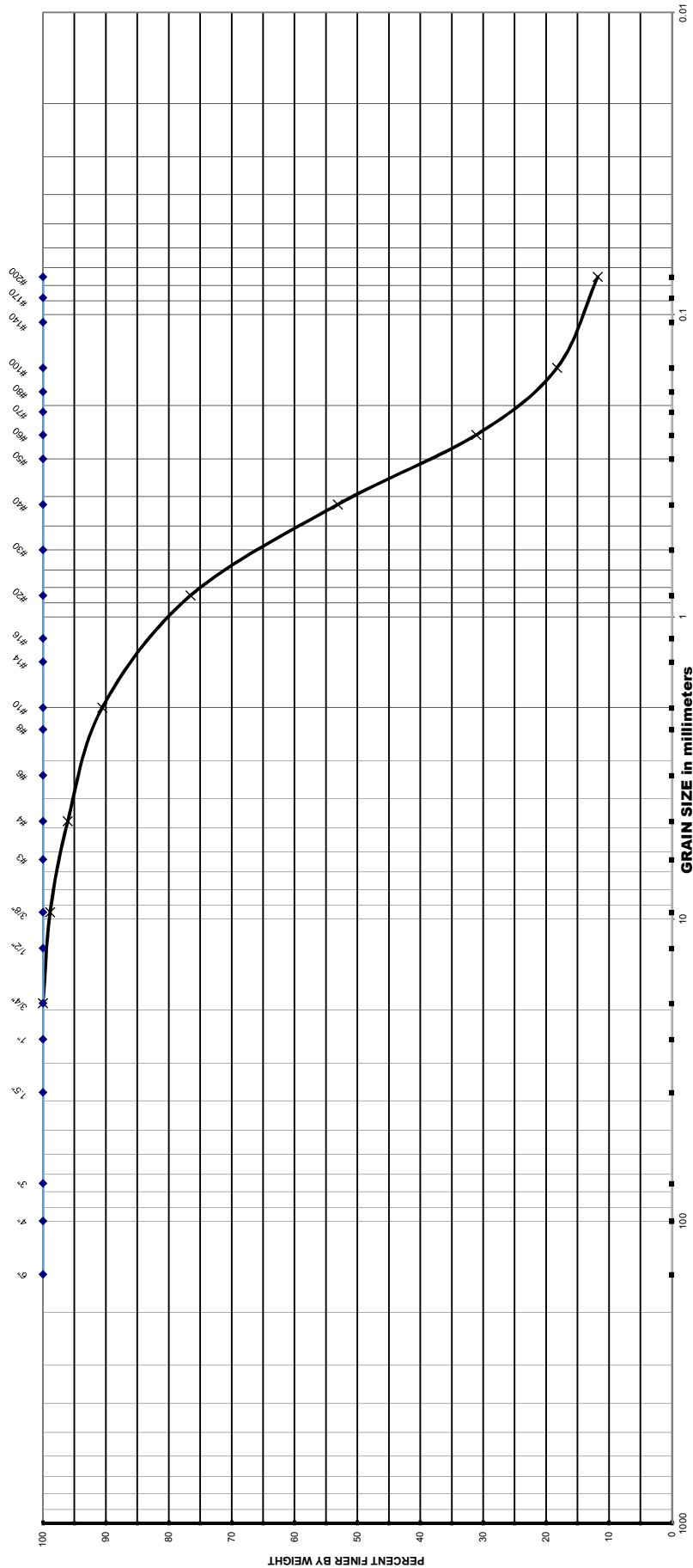


Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal [PBC Project No. 2019803]		U.S. SIEVE NO.	CUMM. % PASSING
Project No. :		2000-01-21005		3/4"	100.0
		Date : 8/31/2022		3/8"	98.1
				#4	89.7
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	#10	76.5
R-306	6.0 - 8.0	A-4	35.0	#20	62.0
				#40	51.5
				#60	45.0
			Note : MC - Moisture Content (%)		
			OC - Organic Content (%)		
			#100	40.6	
			#200	37.2	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803]		
Project No. :		2000-01-21005		
		Date : 9/6/2022		
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION		
R-306	8.0 - 10.0		MC	OC
			33.4	
		Note : MC - Moisture Content (%)		
		OC - Organic Content (%)		
		#100		18.3
		#200		11.8

Project No. : 2000-01-21005

Date : 9/6/2022

SOIL DESCRIPTION

A-2-4

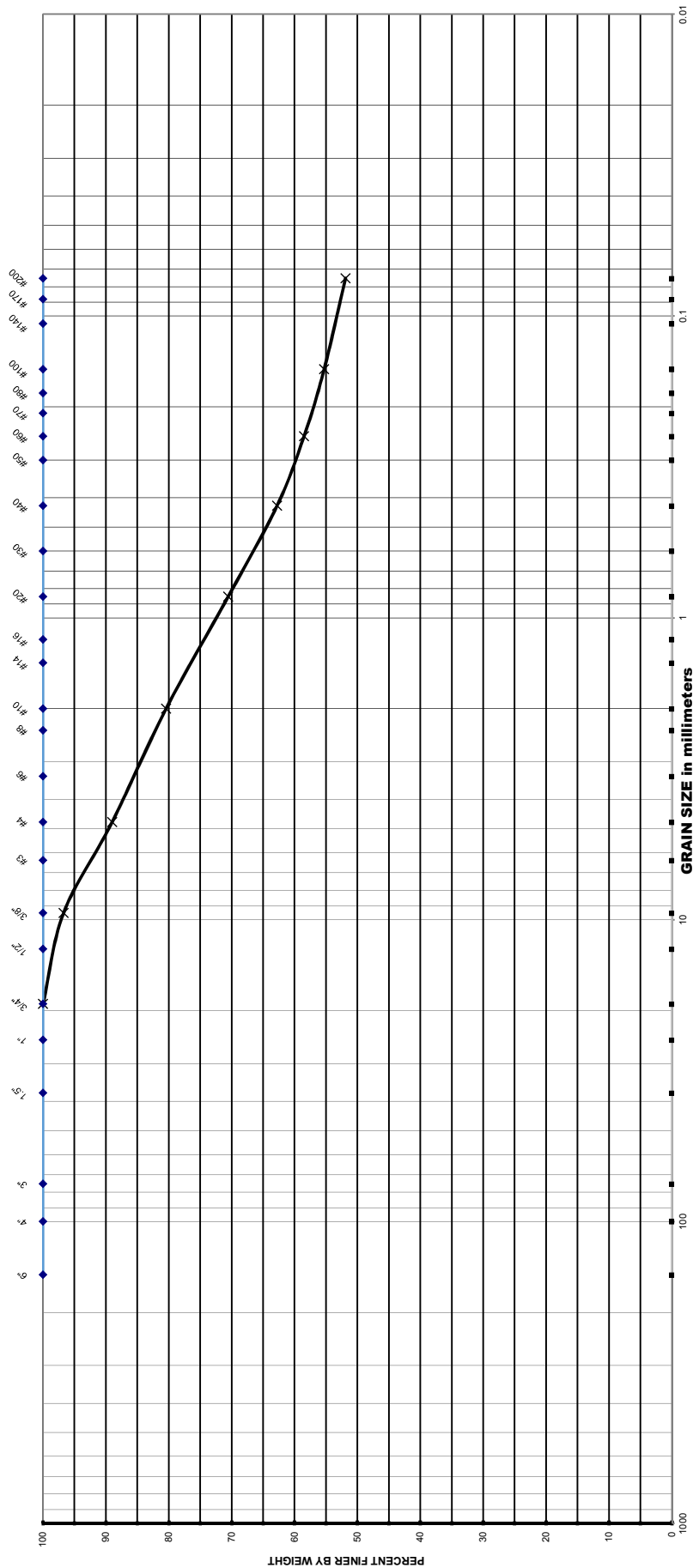
MC

OC

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

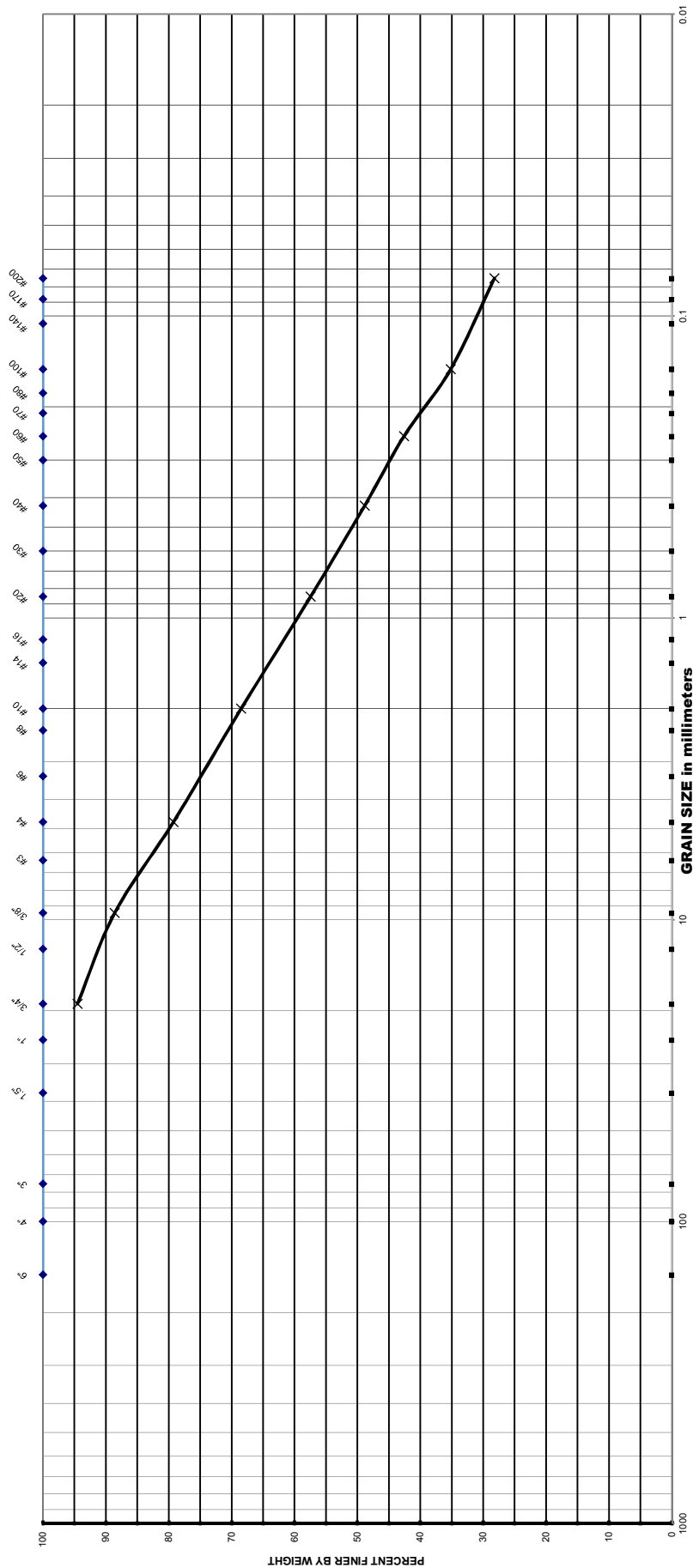


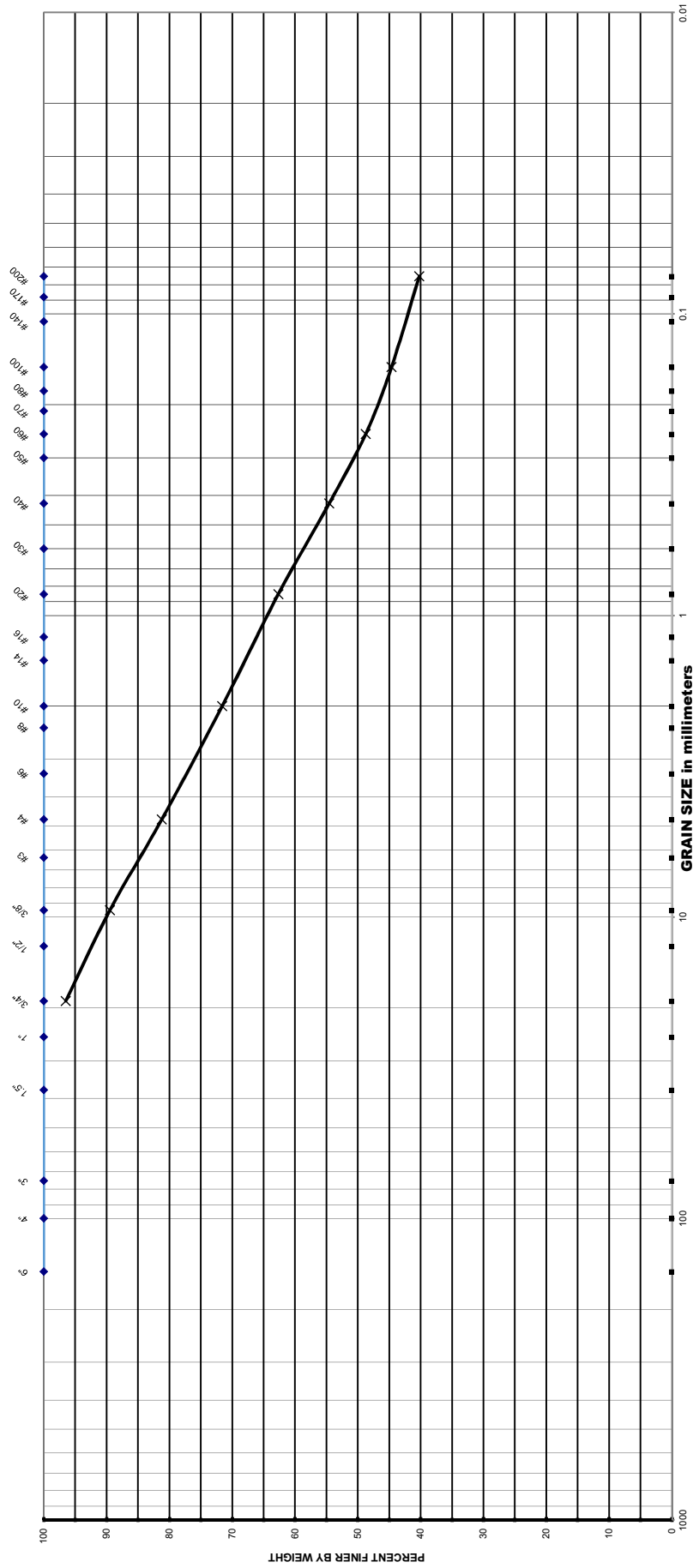
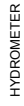
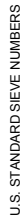
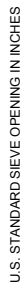
Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal [PBC Project No. 2019803]		U.S. SIEVE NO.	CUMM. % PASSING
Project No. :		2000-01-21005		3/4"	100.0
		Date : 9/6/2022		3/8"	96.7
				#4	89.0
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	#10	80.4
PC-1	13.5 - 15.0	A-4	41.4	#20	70.6
				#40	62.8
				#60	58.5
			Note : MC - Moisture Content (%)		
			OC - Organic Content (%)		
			#100	55.3	
			#200	51.9	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



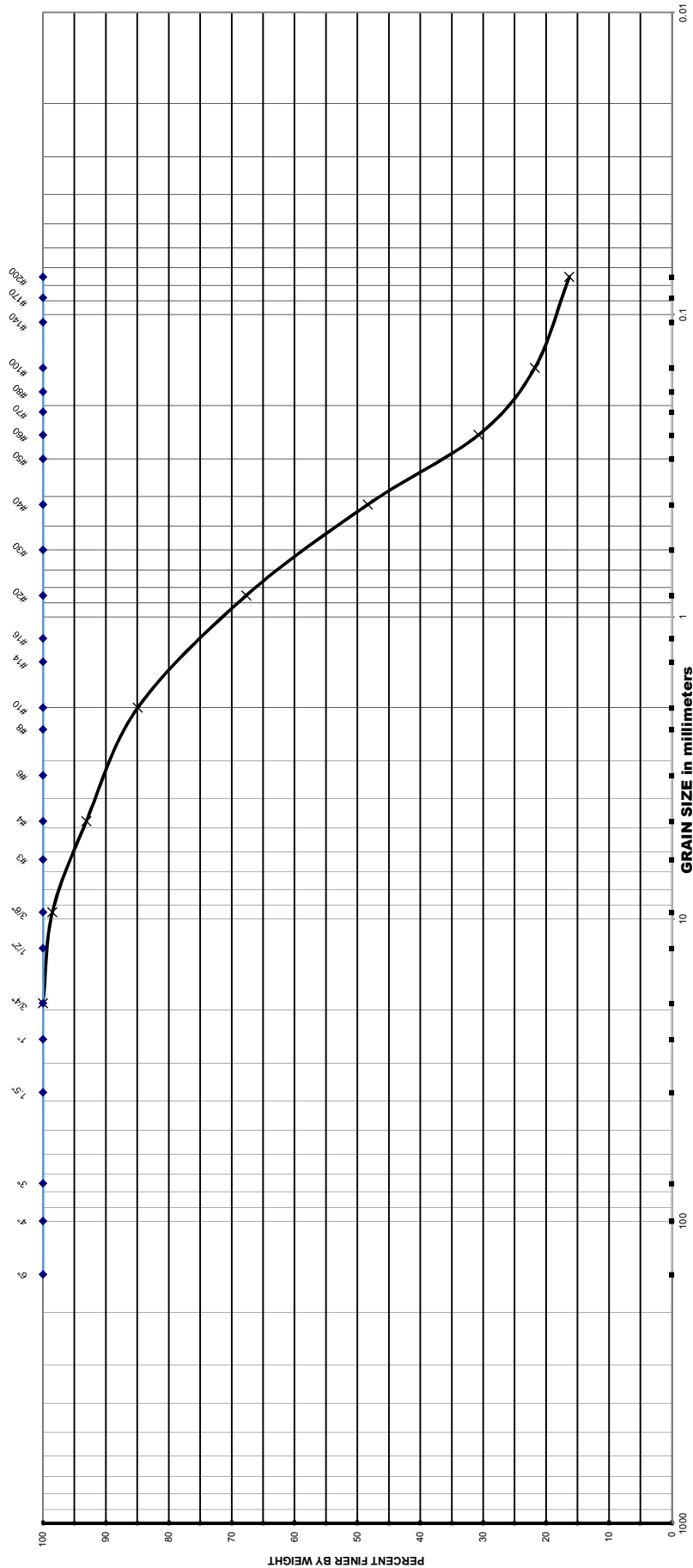


Project Name : CR-880: Sam Senter Road over SFWMD Ocean Canal[PBC Project No. 2019803]				U.S SIEVE NO.		CUMM. % PASSING			
				3/4"		96.5			
				3/8"		89.5			
				#4		81.2			
Project No. : 2000-01-21005				Date : 9/6/2022					
BORING NO.		DEPTH INTERVAL [FT]		SOIL DESCRIPTION		MC		OC	
PC-4		12.0 - 13.5		A-4		30.0			
				Note : MC - Moisture Content (%) OC - Organic Content (%)					
						#10		71.6	
						#20		62.7	
						#40		54.6	
						#60		48.7	
						#100		44.7	
						#200		40.2	

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



Project Name :		CR-880: Sam Senter Road over SFWMD Ocean Canal IPBC Project No. 2019803]		U.S. SIEVE NO.	CUMM. % PASSING
Project No. :		2000-01-21005		3/4"	100.0
		Date : 9/6/2022		3/8"	98.5
				#4	93.1
BORING NO.	DEPTH INTERVAL [FT]	SOIL DESCRIPTION	MC	#10	84.9
PC-5	12.0 - 13.5	A-1-b	39.9	#20	67.7
				#40	48.4
				#60	30.8
			Note : MC - Moisture Content (%)		
			OC - Organic Content (%)		
			#100	21.8	
			#200	16.3	

TABLE -1A**SUMMARY OF INDEX PROPERTY TEST RESULTS****Project: CR-880: Sam Senter Road over SFWMD Ocean Canal [PBC Project No. 2019803]**

Stratum No.	AASHTO Symbol	Moisture Content Range (%)	Organic Content Range (%)	Fine Content Range (%)
1	A-1-b, A-2-4	11.5 — 16.8		17.0 — 34.4
1A	A-8			
2	A-8	17.7 — 426.3	6.1 — 89.3	
3	(Limestone)			
4	(Limestone)			
5	A-1-b, A-2-4	19.8 — 43.1		11.8 — 35.2
5A	A-4	15.5 — 62.8		37.2 — 60.4
5B	A-3			
5C	A-1-b	27.1		11.9

TABLE - 2

SUMMARY OF PEAT CONSOLIDATION TEST RESULTS

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal [PBC Project No. 2019803]

Boring No.	Station	Offset	Peat Sample Depth Interval (feet)	Organic Content (%)	Fine Content (%)	Compressi on Index C_c	Compressi on Index C_r	Preconsoli dation Pressure P_c (psf)	Initial Void Ratio e_0	Load / Applied Pressure (psf)	Coefficient of Consolidation C_v (ft. ² /day)	Secondary Consolidation C_α
R-108	89+94 (CL CR-880)	27.6' RT	2.0 — 4.0	43.4	23.2	3.73	0.36	1934	7.532	63	0.992	
										250	3.288	0.027
										1000	1.318	0.009
										500	3.418	
										4000	0.619	0.136
R-304	101+34 (CL CR-880)	0.4' LT	8.0 — 10.0	64.2	36.5	4.37	0.41	2960	6.181	125	1.265	0.002
										250	2.260	0.008
										2000	2.434	0.134
										8000	0.024	0.247
B-3	10+29 (CL SSR)	30.4' RT	6.0 — 8.0	61.2	27.0	4.47	0.64	2923	7.418	63	0.135	
										250	2.278	0.032
										2000	3.531	0.061
										125	3.295	
										4000	0.415	0.186
										8000	0.072	0.330

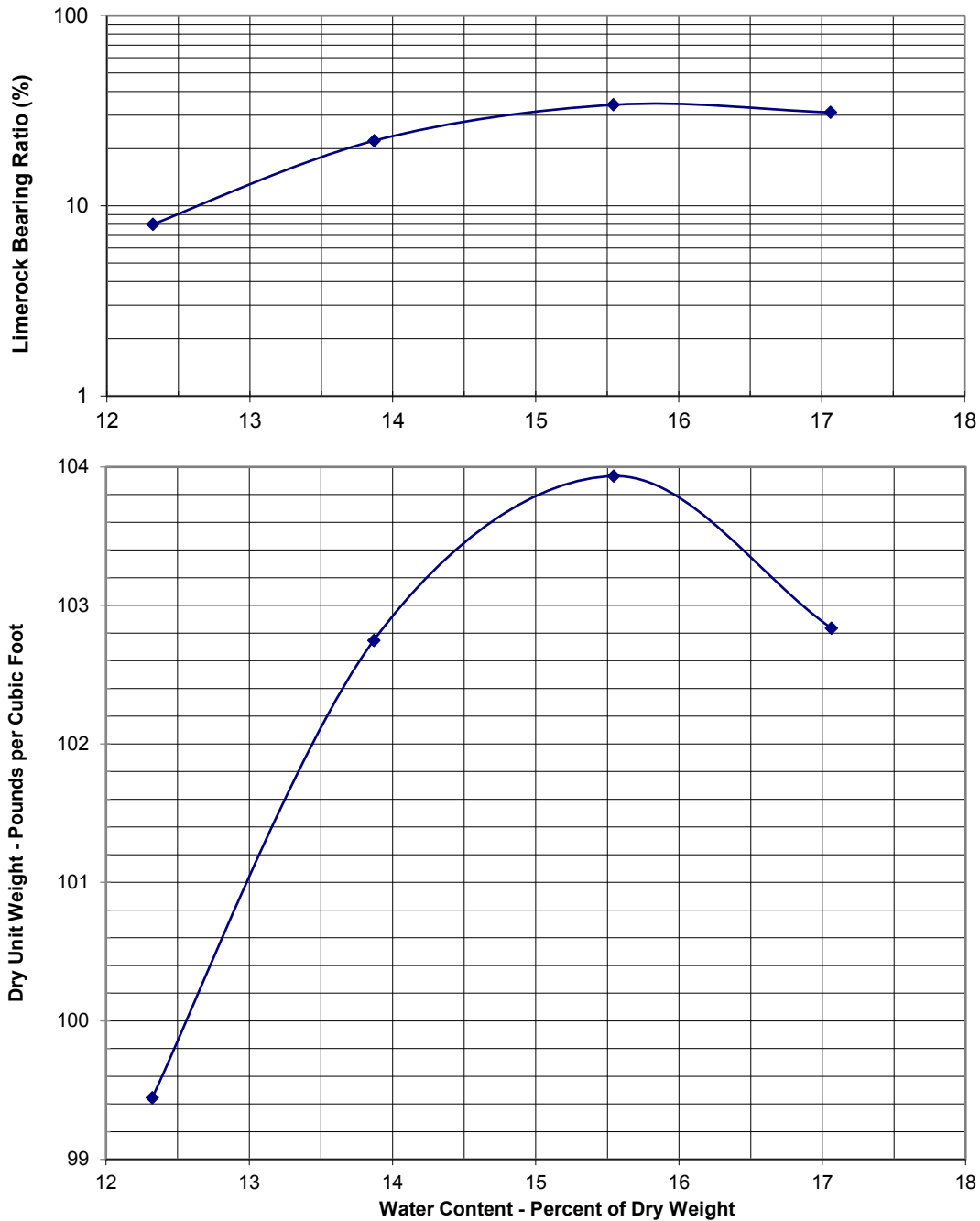
TABLE - 3

Limerock Bearing Ratio (LBR) Test Summary

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal [PBC Project No. 2019803]

No.	Location	Maximum LBR Value (%)	Maximum Dry Density (pcf)	Optimum Water Content (%)
1	LBR-1, Approx. Sta. 84+00, RT	34	103.9	15.5
2	LBR-2, Approx. Sta. 111+20, RT	43	110.1	14.3

SUPPLEMENTAL SPECIAL PROVISIONS

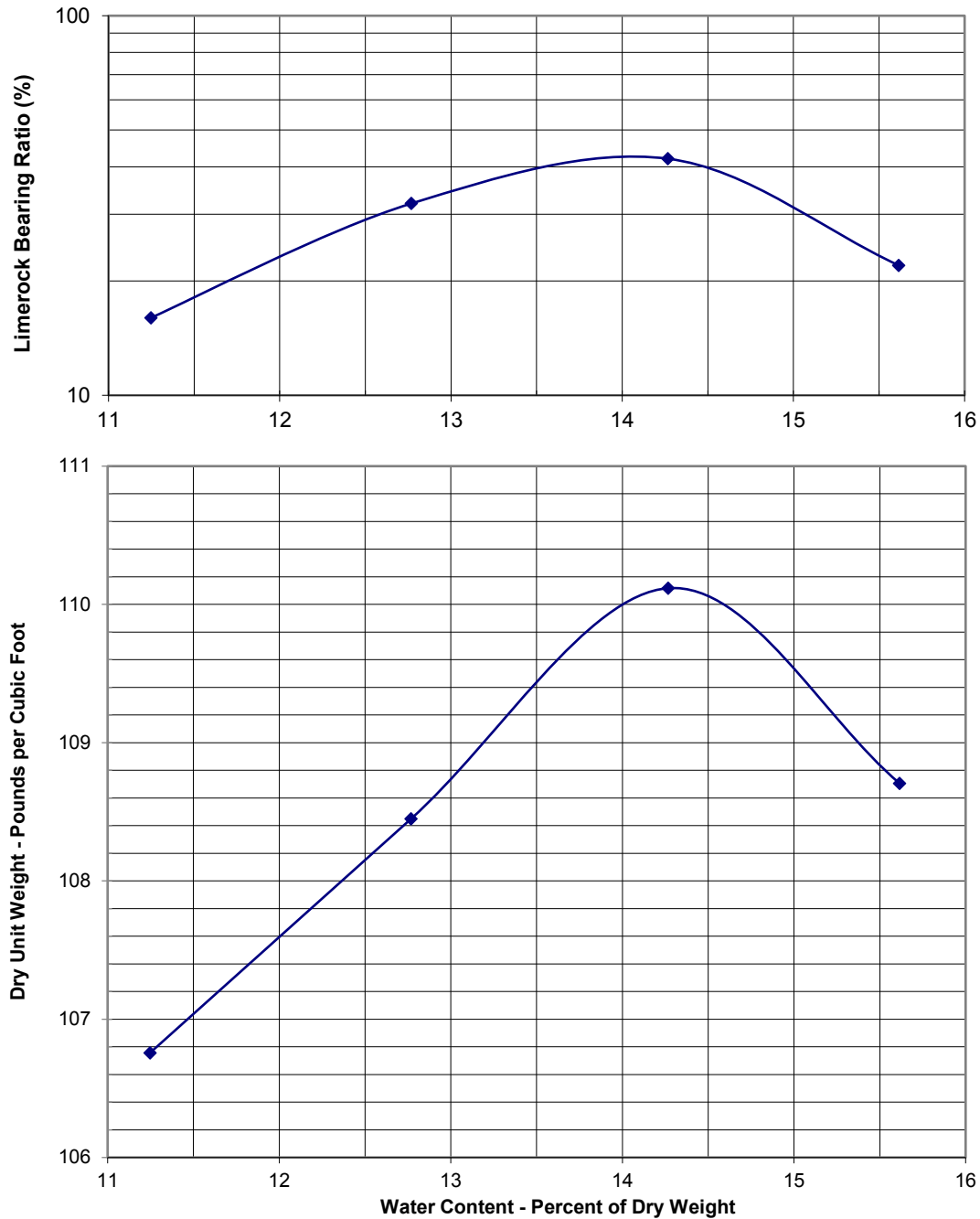


Summary of Test Results	
Maximum LBR Value (%)	34
Maximum Dry Density (pcf)	103.9
Optimum Water Content (%)	15.5

SAMPLE NO.: 1
 Location: CR-880 (EB), 57' from end of Pavement (Sta 84+00)
 DEPTH INTERVAL: 1 TO 3 FEET
 MATERIAL DESCRIPTION:
 Dark brown medium to fine sand, few limestone fragments & shell, trace clay

LIMEROCK BEARING RATIO					
CR-880: Sam Senter Road over SFWMD Ocean Canal					
PALM BEACH COUNTY, FLORIDA					
GCME		GCME, INC.			
		GEOTECHNICAL-CONSULTING-ENGINEERING-TESTING			
DRAWN:		SAMPLE DATE:	8/29/22	PROJECT NO.:	2000-01-21005
CHECKED:	ZP	REPORT DATE:	10/7/22	SHEET NO.:	LBR-1

SUPPLEMENTAL SPECIAL PROVISIONS



Summary of Test Results	
Maximum LBR Value (%)	43
Maximum Dry Density (pcf)	110.1
Optimum Water Content (%)	14.3

SAMPLE NO.: 2
 Location: CR-880 (EB), 30' from end of Pavement (Sta 111+20)
 DEPTH INTERVAL: 1 TO 3 FEET
 MATERIAL DESCRIPTION:
 Dark brown medium to fine sand, few limestone fragments & shell, trace clay

LIMEROCK BEARING RATIO					
CR-880: Sam Senter Road over SFWMD Ocean Canal PALM BEACH COUNTY, FLORIDA					
GCME		GCME, INC.			
		GEOTECHNICAL-CONSULTING-ENGINEERING-TESTING			
DRAWN:		SAMPLE DATE:	8/29/22	PROJECT NO.:	2000-01-21005
CHECKED:	ZP	REPORT DATE:	10/7/22	SHEET NO.:	LBR-2

SUPPLEMENTAL SPECIAL PROVISIONS

TABLE - 4

SUMMARY OF CORROSION TEST RESULTS [PBC Project No. 2019803]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Latitude	Longitude	Soil Type	Sample	Stratum	Depth Interval	pH	Resistivity (ohm-cm)	Chloride (ppm)	Sulfate (ppm)	Environmental Classification (Substructure)	
											Steel	Concrete
B-3	26.678282°	-80.538475°	A-2-4	Soil	5	12.0 - 13.5	8.5	4200	22.0	150.0	Moderately Aggressive	Slightly Aggressive
R-102	26.675412°	-80.544005°	A-4	Soil	5A	4.0 - 6.0	8.5	4200	8.9	160.0	Moderately Aggressive	Slightly Aggressive
Canal Water				Water			8.5	1900	63.0	28.0	Moderately Aggressive	Moderately Aggressive

Table 1.3.2-1 Criteria for Substructure Environmental Classifications

Classification	Environmental Condition	Units	Steel		Concrete	
			Water	Soil	Water	Soil
Extremely Aggressive (If any of these conditions exist)	pH		< 6.0		< 5.0	
	Cl	ppm	> 2000		> 2000	
	SO ₄	ppm	N.A.		> 1500	> 2000
	Resistivity	Ohm-cm	< 1000		< 500	
Slightly Aggressive (If all of these conditions exist)	pH		> 7.0		> 6.0	
	Cl	ppm	<500		< 500	
	SO ₄	ppm	N.A.		< 150	< 1000
	Resistivity	Ohm-cm	> 5000		> 3000	
Moderately Aggressive	This classification must be used at all sites not meeting requirements for either slightly aggressive or extremely aggressive environments.					
pH = acidity (-log ₁₀ H ⁺ ; potential of Hydrogen), Cl = chloride content, SO ₄ = Sulfate content.						

SUPPLEMENTAL SPECIAL PROVISIONS

TABLE - 5

Groundwater Information [PBC Project No. : 2019803]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring #	Depth (ft)	Station	Offset	Elevation (ft)	GWT (ft)	GWT Elev. (ft)	Date
R-101	10	76+00.00	12.80 RT	17.67	GNE		7/18/2022
R-102	10	78+02.75	38.30 RT	8.86	2.5	6.4	8/9/2022
R-103	10	79+97.66	5.18 RT	17.22	GNE		7/18/2022
R-104	10	82+13.47	28.67 RT	9.44	3.3	6.1	8/9/2022
R-105	10	83+91.94	2.71 RT	17.28	GNE		7/18/2022
R-106	10	86+36.00	24.71 RT	9.99	3.5	6.5	8/9/2022
R-107	10	87+95.37	0.46 RT	18.62	GNE		7/18/2022
R-108	10	89+93.91	27.62 RT	9.30	4.0	5.3	8/9/2022
R-109	10	92+23.65	4.20 RT	18.34	GNE		7/18/2022
R-110	10	94+07.65	24.93 RT	9.93	3.0	6.9	8/9/2022
R-111	10	96+06.76	2.73 LT	19.13	GNE		7/18/2022
R-112	10	98+08.93	25.34 RT	9.26	3.5	5.8	8/10/2022
R-113	10	99+95.53	3.16 RT	16.82	9.0	7.8	7/18/2022
R-114	10	102+15.99	24.53 RT	9.51	4.0	5.5	8/10/2022
R-115	10	103+92.28	3.46 RT	16.76	GNE		7/18/2022
R-116	10	105+91.52	24.87 RT	9.56	4.0	5.6	8/10/2022
R-117	10	107+93.62	3.02 RT	16.79	GNE		7/18/2022
R-118	10	110+02.65	25.75 RT	9.51	4.0	5.5	8/10/2022
R-119	10	112+04.03	6.54 RT	17.12	9.0	8.1	7/18/2022
R-120	10	114+09.48	32.80 RT	9.82	4.0	5.8	8/10/2022
R-121	10	115+96.85	10.52 RT	17.28	10.0	7.3	7/18/2022
R-122	10	117+70.00	33.52 RT	14.59	4.5	10.1	8/10/2022
R-201	10	11+96.13	24.36 LT	15.67	GNE		7/18/2022
R-202	10	13+06.82	6.65 RT	16.17	10.0	6.2	7/18/2022
R-203	10	13+96.76	20.26 LT	13.67	9.0	4.7	7/18/2022
R-301	20	85+03.03	31.26 RT	8.58	3.4	5.2	8/9/2022
R-302	20	91+38.64	25.78 RT	10.41	4.0	6.4	8/9/2022
R-303	20	94+95.10	25.11 RT	9.65	4.0	5.7	8/10/2022
R-304	20	101+33.98	0.39 LT	17.66	11.5	6.2	8/16/2022
R-305	20	107+09.41	26.09 RT	9.06	3.6	5.5	8/10/2022
R-306	20	113+01.39	31.97 RT	10.03	3.5	6.5	8/10/2022
PC-1	20	76+56.35	4.06 RT	17.73	GNE		8/16/2022
PC-2	20	84+01.59	8.67 LT	17.52	GNE		7/20/2022
PC-3	20	93+07.45	24.61 LT	20.54	GNE		7/20/2022
PC-4	20	100+49.05	10.03 LT	17.84	GNE		7/20/2022
PC-5	20	108+19.39	7.57 LT	17.73	11.3	6.4	7/20/2022
PC-6	20	116+94.63	1.85 LT	17.99	GNE		8/16/2022
PC-7	2	92+85.76	29.94 LT	20.16	GNE		7/20/2022
B-1	100	10+34.86	50.58 LT	17.34	11.8	5.5	8/9/2022
B-2	100	11+48.69	24.92 LT	16.75	12.7	4.1	7/14/2022
B-3	100	10+28.84	30.42 RT	17.56	10.2	7.4	8/17/2022
B-4	100	11+47.29	4.06 RT	18.30	12.6	5.7	7/15/2022

SUPPLEMENTAL SPECIAL PROVISIONS

TABLE - 6

Muck Probe Information [PBC Project No. : 2019803]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Latitude	Longitude	Approximate Station	Offset from EOP	Depth (ft) below grade		Material Below Muck
					Top of Muck	Bottom of Muck	
1A	26.67504	-80.54446	76+00	28	0.0	3.5	Brown Sand with some Limerock Fragments
1B	26.67502	-80.54444	76+00	36	0.0	2.8	Brown Sand with some Limerock Fragments
2A	26.67524	-80.54422	77+00	30	0.0	3.5	Brown Sand with some Limerock Fragments
2B	26.67522	-80.54420	77+00	39	0.0	3.5	Brown Sand with some Limerock Fragments
3A	26.67539	-80.54397	78+00	46	0.0	2.5	Brown Sand with some Limerock Fragments
4A	26.67562	-50.54378	79+00	27	0.0	4.0	Brown Sand with some Limerock Fragments
4B	26.67559	-80.54375	79+00	41	0.0	3.5	Brown Sand with some Limerock Fragments
5A	26.67581	-80.54356	80+00	26	0.0	3.0	Brown Sand with some Limerock Fragments
5B	26.67578	-80.54353	80+00	40	0.0	3.0	Brown Sand with some Limerock Fragments
6A	26.67600	-80.54333	81+00	26	0.0	3.0	Brown Sand with some Limerock Fragments
6B	26.67598	-80.54331	81+00	37	0.0	3.0	Brown Sand with some Limerock Fragments
7A	26.67618	-80.54307	82+20	38	0.0	3.5	Brown Sand with some Limerock Fragments
8A	26.67636	-80.54292	83+00	27	0.0	2.5	Brown Sand with some Limerock Fragments
8B	26.67634	-80.54289	83+00	35	0.0	2.5	Brown Sand with some Limerock Fragments
9A	26.67656	-80.54268	84+00	23	0.0	2.5	Brown Sand with some Limerock Fragments
9B	26.67654	-80.54267	84+00	33	0.0	2.5	Brown Sand with some Limerock Fragments
10A	26.67672	-80.54241	85+00	43	0.0	2.0	Brown Sand with some Limerock Fragments
11A	26.67692	-80.54217	86+20	43	0.0	2.0	Brown Sand with some Limerock Fragments
12A	26.67710	-80.54198	87+00	29	1.8	3.0	Brown Sand with some Limerock Fragments
12B	26.67707	-80.54195	87+00	42	1.5	3.0	Brown Sand with some Limerock Fragments
13A	26.67725	-80.54174	88+20	28	1.5	3.5	Brown Sand with some Limerock Fragments
13B	26.67724	-80.54171	88+20	41	1.5	3.5	Brown Sand with some Limerock Fragments
14A	26.67739	-80.54152	89+00	24	2.0	4.5	Brown Sand with some Limerock Fragments
14B	26.67738	-80.54150	89+00	32	2.0	4.0	Brown Sand with some Limerock Fragments
15A	26.67750	-80.54120	90+00	41	2.0	4.0	Brown Sand with some Limerock Fragments
16A	26.67764	-80.54090	91+20	37	2.0	4.3	Brown Sand with some Limerock Fragments
17A	26.67775	-80.54063	92+20	29	1.0	3.0	Brown Sand with some Limerock Fragments
17B	26.67770	-80.54061	92+20	46	1.5	3.5	Brown Sand with some Limerock Fragments
18A	26.67786	-80.54035	93+20	26	1.0	3.0	Brown Sand with some Limerock Fragments
18B	26.67784	-80.54034	93+20	36	1.0	3.0	Brown Sand with some Limerock Fragments
19A	26.67789	-80.54009	94+00	42	0.0	2.5	Brown Sand with some Limerock Fragments
20A	26.67796	-80.53979	95+10	43	0.0	2.5	Brown Sand with some Limerock Fragments
21A	26.67807	-80.53953	96+00	25	1.0	3.0	Brown Sand with some Limerock Fragments
21B	26.67804	-80.53952	96+00	33	0.5	2.5	Brown Sand with some Limerock Fragments
22A	26.67810	-80.53922	97+00	28	1.0	2.5	Brown Sand with some Limerock Fragments

SSP-163D

SUPPLEMENTAL SPECIAL PROVISIONS

TABLE - 6

Muck Probe Information [PBC Project No. : 2019803]

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

Boring No.	Latitude	Longitude	Approximate Station	Offset from EOP	Depth (ft) below grade		Material Below Muck
					Top of Muck	Bottom of Muck	
22B	26.67808	-80.53922	97+00	35	0.0	2.5	Brown Sand with some Limerock Fragments
23A	26.67811	-80.53887	98+20	34	0.0	2.5	Brown Sand with some Limerock Fragments
24A	26.67813	-80.53865	99+00	29	N/A	N/A	Brown Sand with some Limerock Fragments
24B	26.67811	-80.53866	99+00	34	N/A	N/A	Brown Sand with some Limerock Fragments
25A	26.67814	-80.53836	99+90	26	N/A	N/A	Brown Sand with some Limerock Fragments
25B	26.67811	-80.53836	99+90	34	N/A	N/A	Brown Sand with some Limerock Fragments
26A	26.67813	-80.53803	101+00	27	N/A	N/A	Brown Sand with some Limerock Fragments
26B	26.67809	-80.53803	101+00	40	0.0	1.5	Brown Sand with some Limerock Fragments
27A	26.67811	-80.53768	102+10	36	0.0	3.0	Brown Sand with some Limerock Fragments
28A	26.67813	-80.53743	102+90	28	0.0	2.5	Brown Sand with some Limerock Fragments
28B	26.67811	-80.53743	102+90	36	0.0	2.0	Brown Sand with some Limerock Fragments
29A	26.67814	-80.53710	104+00	24	0.0	3.0	Brown Sand with some Limerock Fragments
29B	26.67810	-80.53711	104+00	36	0.0	3.0	Brown Sand with some Limerock Fragments
30A	26.67813	-80.53679	105+00	27	0.0	2.5	Brown Sand with some Limerock Fragments
30B	26.67809	-80.53670	105+00	39	0.0	2.5	Brown Sand with some Limerock Fragments
31A	26.67809	-80.53649	106+00	40	0.0	2.8	Brown Sand with some Limerock Fragments
32A	26.67810	-80.53617	107+00	36	0.0	2.0	Brown Sand with some Limerock Fragments
33A	26.67814	-80.53591	107+90	24	0.0	1.0	Brown Sand with some Limerock Fragments
33B	26.67809	-80.53590	107+90	38	N/A	N/A	Brown Sand with some Limerock Fragments
34A	26.67813	-80.53555	109+00	23	0.0	1.5	Brown Sand with some Limerock Fragments
34B	26.67810	-80.53555	109+00	33	0.0	1.5	Brown Sand with some Limerock Fragments
35A	26.67809	-80.53527	110+00	38	0.0	3.5	Brown Sand with some Limerock Fragments
36A	26.67813	-80.53498	110+90	24	0.0	1.5	Brown Sand with some Limerock Fragments
36B	26.67809	-80.53498	110+90	36	0.0	1.0	Brown Sand with some Limerock Fragments
37A	26.67812	-80.53467	112+00	27	N/A	N/A	Brown Sand with some Limerock Fragments
37B	26.67809	-80.53468	112+00	39	N/A	N/A	Brown Sand with some Limerock Fragments
38A	26.67809	-80.53434	113+00	38	0.0	1.5	Brown Sand with some Limerock Fragments
39A	26.67810	-80.53402	114+00	34	0.0	1.5	Brown Sand with some Limerock Fragments
40A	26.67815	-80.53374	115+00	19	N/A	N/A	Brown Sand with some Limerock Fragments
40B	26.67812	-80.53375	115+00	27	N/A	N/A	Brown Sand with some Limerock Fragments
41A	26.67816	-80.53344	116+00	12	N/A	N/A	Brown Sand with some Limerock Fragments
42A	26.67816	-80.53312	117+00	14	N/A	N/A	Brown Sand with some Limerock Fragments

CR-880 at Sam Senter Rd

Over SFWMD Ocean Canal

Legend

- Muck Probe (Hand Auger)
- SPT Boring

SSP-165D

PC-1

R-101

76

77

78

79

80

N 46° 58' 48" E

R-103

1A (3.5')

1B (2.8')

2A (3.5')

2B (3.5')

R-102 (2')

3A (2.5')

4A (4')

4B (3.5')

5A (3')

5B (3')

Google Earth

APPROXIMATE BORING
LOCATION PLAN
PLATE-1

100 ft

CR-880 at Sam Senter Rd

Over SFWMD Ocean Canal

Legend

- Muck Probe (Hand Auger)
- SPT Boring

SSP-166

R-103

80

81

82

83

N 45° 58' 45" E

PC-2

R-105

5A (3')

5B (3')

6A (3')

6B (3')

R-104 (2')

7A (3.5')

8A (2.5')

8B (2.5')

9A (2.5')

9B (2.5')

Google Earth

APPROXIMATE BORING
LOCATION PLAN
PLATE-2

100 ft

Over SFWMD Ocean Canal

- Muck Probe (Hand Auger)
- SPT Boring



100 ft

CR-880 at Sam Senter Rd

Over SFWMMD Ocean Canal

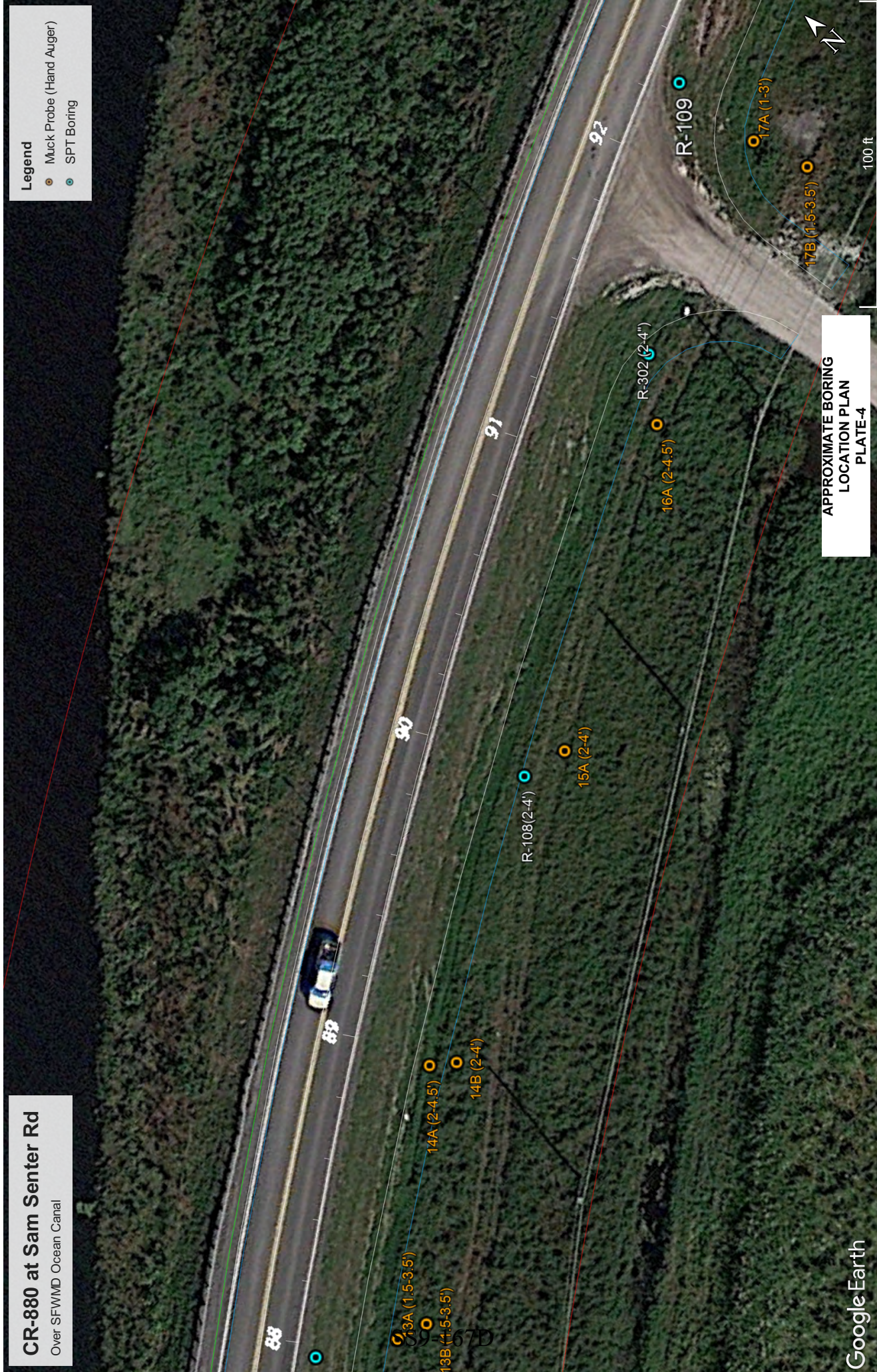
Legend

- Muck Probe (Hand Auger)
- SPT Boring

Google Earth

APPROXIMATE BORING
LOCATION PLAN
PLATE-4

100 ft



Over SFWMD Ocean Canal

- Muck Probe (Hand Auger)
- SPT Boring



Google Earth

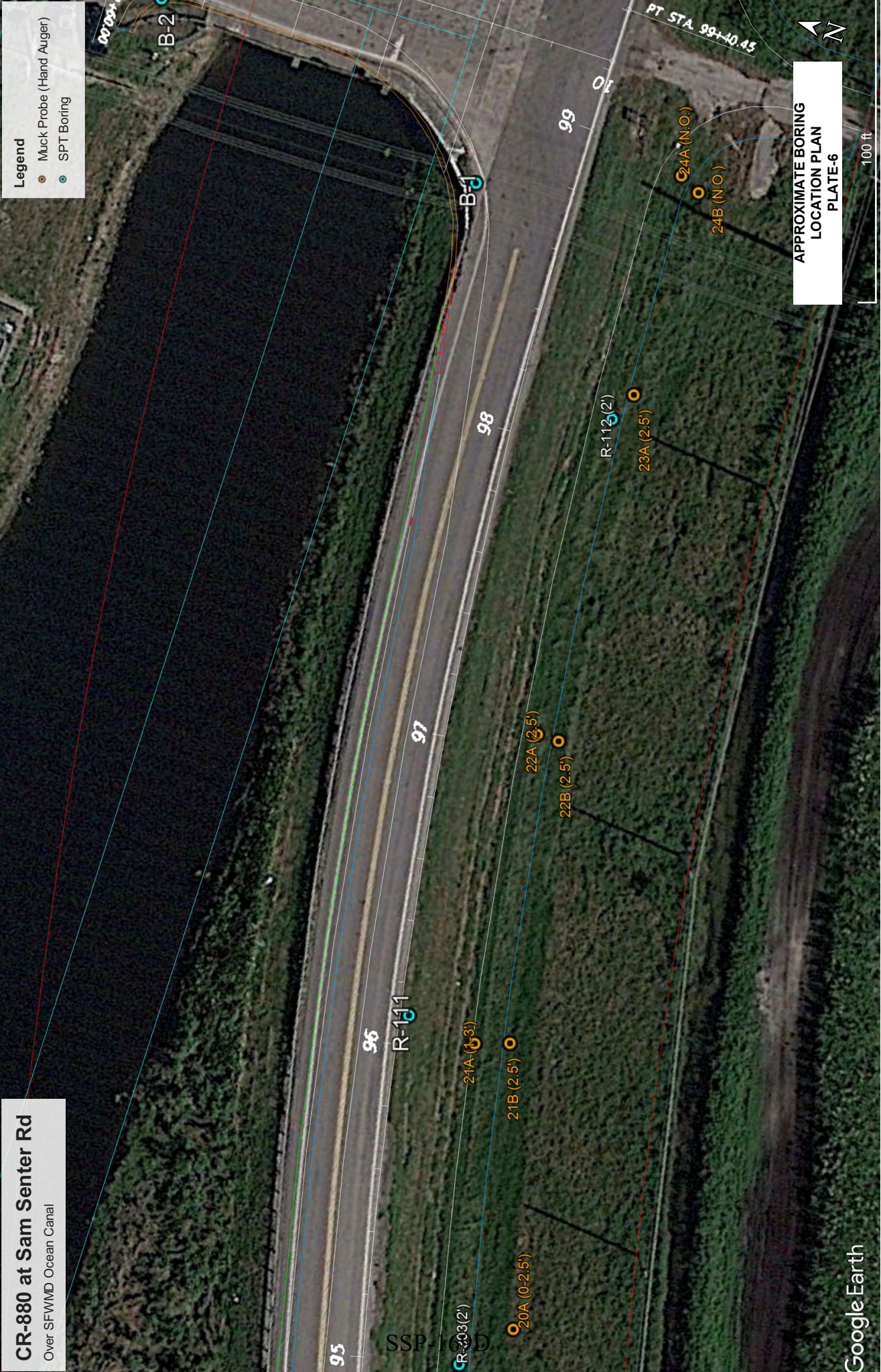
100 ft



Legend

- Muck Probe (Hand Auger)
- SPT Boring

CR-880 at Sam Senter Rd
Over SFWMD Ocean Canal



**APPROXIMATE BORING
LOCATION PLAN
PLATE-6**

CR-880 at Sam Senter Rd

Over SFWMD Ocean Canal

Legend

- Muck Probe (Hand Auger)
- SPT Boring

APPROXIMATE BORING
LOCATION PLAN
PLATE-7

100 ft

Google Earth



CR-880 at Sam Senter Rd

Over SFWMD Ocean Canal

Legend

- Muck Probe (Hand Auger)
- SPT Boring

APPROXIMATE BORING
LOCATION PLAN
PLATE-8

100 ft

Google Earth

SSP-171D

103

104

105

106

107

N 89° 54' 24" E

R-115

28A (2.5')

28B (2')

29A (3')

29B (3')

30A (2.5')

30B (2.5')

R-116 (2')

31A (2.8')

R-305 (2')

32A (2')

CR-880 at Sam Senter Rd

Over SFWMD Ocean Canal

Legend

- Muck Probe (Hand Auger)
- SPT Boring

PI STA 111+21.28

107

108

109

110

111

88' 5' 2' E

SSP-172D

PC-5

R-117

33A (1')

R-305 (2')

32A (2')

34A (1.5')

G33B (N.O.)

34B (1.5')

R-118 (4')

35A (3.5')

36A (4.5')

36B (1')

APPROXIMATE BORING
LOCATION PLAN
PLATE-9



90 ft

Google Earth

CR-880 at Sam Senter Rd

Over SFWMD Ocean Canal

Legend

- Muck Probe (Hand Auger)
- SPT Boring

PI STA 211+21.28

111

112

113

114

115

N 89° 09' 24" E

R-119

SSP-172D

36A (4.5')

36B (1')

37B (N.O.)

C37A (N.O.)

R-306 (2')

C38A (1.5')

R-120 (2')

C39A (1.5')

40A (N.O.)

C40B (N.O.)

APPROXIMATE BORING
LOCATION PLAN
PLATE-10



100 ft

Google Earth

CR-880 at Sam Senter Rd

Over SFWMID Ocean Canal

Legend

Muck Probe (Hand Auger)

SPT Boring

CR-880 at Sam Senter Rd

Over SFWMID Ocean Canal

- Legend
- Muck Probe (Hand Auger)

SPT Boring

SSP-173D

115

116

117

09' 1" E

PC-6

R-121 (6-10')

40A (N.O.)

C40B (N.O.)

C41A (N.O.)

C42A (N.O.)

R-122



APPROXIMATE BORING
LOCATION PLAN
PLATE-11

100 ft

Google Earth

DATE OF SURVEY: 7/18/22 -- 8/16/22
SURVEY MADE BY: GCME, INC.
SUBMITTED BY: PARTHA GHOSH, P.E.

PALM BEACH COUNTY

PBC PROJECT NO: 2019803
PROJECT NAME: CR-880: SAM SENTER ROAD OVER SFWMD OCEAN CANAL

DISTRICT: -
ROAD NO: CR-880
COUNTY: PALM BEACH

CROSS SECTION SOIL SURVEY FOR THE DESIGN OF ROADS
SURVEY BEGINS STA. : 76+00 SURVEY ENDS STA. : 118+00

SUPPLEMENTAL SPECIAL PROVISIONS

STRATUM NO.	NO. OF TESTS	ORGANIC CONTENT	% ORGANIC TESTS	MOISTURE CONTENT	NO. OF MOISTURE TESTS	SIEVE ANALYSIS RESULTS PERCENT PASS (%)				ATTERBERG LIMITS (%)	PLASTIC INDEX	AASHTO GROUP	DESCRIPTION	CORROSION TEST RESULTS			
						10 MESH	40 MESH	60 MESH	100 MESH		200 MESH			NO. OF TESTS	RESISTIVITY ohm-cm	CHLORIDE ppm	SULFATES ppm
P	-	-	-	-	-	-	-	-	-	-	-	-	ASPHALT PAVEMENT	-	-	-	-
1	-	-	7	12-17	7	36-86	25-70	22-59	19-49	-	17-34	-	A-1-b, A-2-4 LIGHT BROWN TO GRAY FINE TO MEDIUM SAND, SOME SHELL FRAGMENTS AND LIMESTONE GRAVELS, SOME CLAYEY SAND LENSES	-	-	-	-
1A	-	-	-	-	-	-	-	-	-	-	-	-	DARK BROWN TO BROWN SAND WITH TRACE ROOTS	-	-	-	-
2	22	6-89	22	18-426	-	-	-	-	-	-	-	-	DARK BROWN TO BLACK SILTY, CLAYEY PEAT	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	LIGHT BROWN TO GRAY SILTY, SANDY LIMESTONE, SHELL FRAGMENTS, WEAKLY TO WELL CEMENTED	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	LIGHT GRAY WEATHERED LIMESTONE	-	-	-	-
5	-	-	8	20-43	8	48-91	39-56	30-48	18-42	-	12-35	-	A-1-b, A-2-4 LIGHT BROWN TO GRAY SILTY SAND WITH FEW TO SOME LIMESTONE FRAGMENTS AND SHELL FRAGMENTS	1	4200	22	150
5A	-	-	12	16-63	12	64-94	52-73	45-69	41-65	-	37-60	-	A-4 LIGHT BROWN TO GRAY SILT WITH TRACE TO FEW LIMESTONE FRAGMENTS	1	4200	9	160
5B	-	-	-	-	-	-	-	-	-	-	-	-	BROWN SAND WITH SILT, TRACE TO FEW LIMESTONE FRAGMENTS	1 (WATER)	1900	63	28
5C	-	-	1	27	1	61	38	30	20	-	12	-	A-1-b LIGHT BROWN SILTY SAND AND SOME SHELL FRAGMENTS	-	-	-	-

EMBANKMENT AND SUBGRADE MATERIAL
STRATA BOUNDARIES ARE APPROXIMATE. MAKE FINAL CHECK AFTER GRADING.

Σ - WATER TABLE ENCOUNTERED

GNE - GROUNDWATER NOT ENCOUNTERED

- NOTES: (1) STRATUM P IS ASPHALT PAVEMENT
(2) STRATUM 1 IS FILL MATERIALS. IT CONSISTS OF SELECT MATERIALS AND ARE ADEQUATE FOR SUBGRADE AND EMBANKMENT SUPPORT, AND SHOULD BE UTILIZED ACCORDING TO STANDARD PLANS, INDEX 120-001.
(3) THE MATERIAL FROM STRATUM 1A IS TOPSOIL (A-8) AND CONSIDERED TO BE UNSUITABLE MATERIAL AND IT SHALL BE REMOVED IN ACCORDANCE WITH SUBSOIL EXCAVATION REFERENCED IN FOOT STANDARD PLANS INDEX 120-002 AND STANDARD SPECIFICATIONS SECTION 120.
(4) STRATUM 2 CONSISTS OF ORGANIC MATERIALS WITH ORGANIC CONTENT OVER 5%. IT SHALL BE REMOVED AND REPLACED WITH SELECT FILL IN ACCORDANCE WITH SUBSOIL EXCAVATION REFERENCED IN FOOT STANDARD PLANS INDEX 120-002. THIS SOIL EXCHANGE WILL NOT BE FEASIBLE, AND HENCE WILL BE HANDLED BY RIGID INCLUSION.
(5) STRATUM 3 AND 4 CONSIST OF LIMESTONE. SPECIALIZED TOOLS AND EQUIPMENT ARE NECESSARY TO EXCAVATE AND/OR PENETRATE THE LIMESTONE LAYER.
(6) STRATUM 5 AND 5C CONSIST OF SELECT MATERIALS AND ARE GENERALLY ADEQUATE FOR SUBGRADE AND EMBANKMENT SUPPORT, AND SHOULD BE UTILIZED ACCORDING TO STANDARD PLANS, INDEX 120-001. HOWEVER, SOME PORTIONS OF THESE SOILS HAVE HIGH FINES CONTENT, AND HENCE WILL RETAIN EXCESS MOISTURE, AND WILL BE DIFFICULT TO HANDLE, PLACE AND COMPACT. THESE MATERIALS MAY BE USED IN THE ROADWAY SUBGRADE WITH EXTRA CAUTION AND PROPER SUPERVISION AND QUALITY CONTROL. A-2-4 MATERIAL PLACED BELOW THE EXISTING WATER LEVEL MUST BE NONPLASTIC AND CONTAIN LESS THAN 15% PASSING THE No. 200 U.S. STANDARD SIEVE.
(7) STRATUM 5A CONSISTS OF PLASTIC MATERIALS. THESE SOILS ARE PRESENT ABOUT 2 FEET OR MORE BELOW EXISTING GRADE, AND BASED ON PROPOSED ROADWAY GRADE, REMOVAL OF THESE SOILS WILL NOT BE NECESSARY.
(8) STRATUM 5B CONSISTS OF SELECT MATERIALS AND ARE ADEQUATE FOR SUBGRADE AND EMBANKMENT SUPPORT, AND SHOULD BE UTILIZED ACCORDING TO STANDARD PLANS, INDEX 120-001. HOWEVER, PORTIONS MAY RETAIN EXCESS MOISTURE DUE TO SLIGHTLY HIGH FINES CONTENT AND COULD BE MORE DIFFICULT TO HANDLE, PLACE AND COMPACT THAN ORDINARY A-3 MATERIAL.

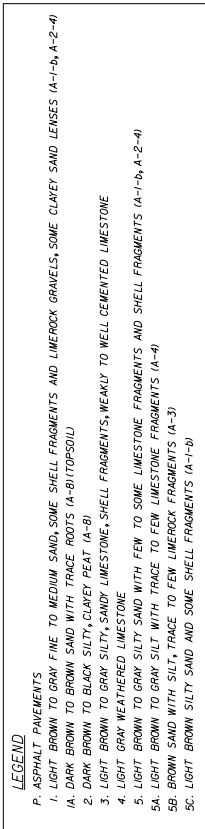
GCME
1730 W. UNIVERSITY BLVD.
RIVERVIEW BEACH, FLORIDA 33404
CERTIFICATE OF AUTHORIZATION NO. 9076
PHONE (361) 845-8727

Revisions	No.	By	Date

Seal: 
PALM BEACH COUNTY
ENGINEERING AND PUBLIC WORKS
ROADWAY PRODUCTION
P.O. BOX 2123, WEST PALM BEACH, FLORIDA

ROADWAY SOIL SURVEY
SCALE: N.T.S.
APPROVED: PG
DRAWN: FP
CHECKED: ZP
DATE: 09/12/23
10/21/2022 5:42:50 PM

SHEET: 1
OF: 1
PROJECT NO: 2019803



- ∇ GROUNDWATER LEVEL RECORDED ON THE DATE OF DRILLING.
- ONE-WATER TABLE NOT ENCOUNTERED WITHIN THE DEPTH OF EXPLORATION.
- DRILLED BY: AND GARCIA / ALEXANDRE / MIGUEL LOBO
- COORDINATES INFORMATION ARE MEASURED BY HANDHELD GPS.
- STATION / OFFSET / ELEVATION INFORMATION ARE PROVIDED BY SURVEYORS
- N = STANDARD PENETRATION RESISTANCE IN BLOWS PER 12 INCHES.
- MC = NATURAL MOISTURE CONTENT (%)
- 200 = FINES PASSING #200 SIEVE (%)
- OC = ORGANIC CONTENT (%)
- (A-3) = AASHTO SOIL SYMBOL

GCME
GCME, INC.
1730 W. 10TH STREET
RIVIERA BEACH, FLORIDA 33404
CERTIFICATE OF AUTHORIZATION NO. 9076
PHONE (561) 845-8727



PALM BEACH COUNTY
ENGINEERING AND PUBLIC WORKS
ROADWAY PRODUCTION
P.O. BOX 21229, WEST PALM BEACH, FLORIDA

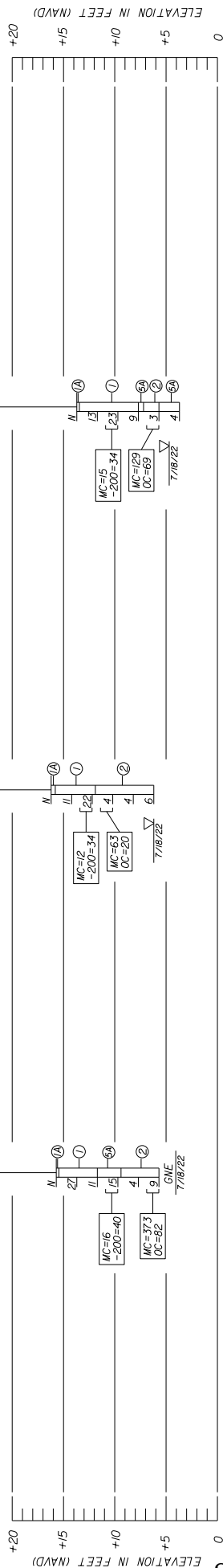
SHEET:	OF: -	PROJECT NO. 2019803
--------	-------	------------------------

BORING NO.
STATION
OFFSET
ELEVATION
LONGITUDE
HAMMER
DATE

R-201
11+96 (CL SSR)
24.4' LT
15.17°N
206°28'W
-80.5386°
AUTOMATIC
7/18/22

R-202 (CL SSR)
13+07
6.7' RT
16.25°N
206°28'W
-80.5385°
AUTOMATIC
7/18/22

R-203 (CL SSR)
13+97
20.3' LT
15.17°N
206°28'W
-80.5386°
AUTOMATIC
7/18/22



SSP-176D

LEGEND

- P. ASPHALT PAVEMENTS
- 1. LIGHT BROWN TO GRAY FINE TO MEDIUM SAND, SOME SHELL FRAGMENTS AND LIMESTONE GRAVELS, SOME CLAYEY SAND LENSES (A-1-b, A-2-4)
- 1A. DARK BROWN TO BROWN SAND WITH TRACE ROOTS (A-BITTOPSOIL)
- 2. DARK BROWN TO BLACK SILTY, CLAYEY PEAT (A-B)
- 3. LIGHT BROWN TO GRAY SILTY, SANDY LIMESTONE, SHELL FRAGMENTS, WEAKLY TO WELL CEMENTED LIMESTONE
- 4. LIGHT GRAY WEATHERED LIMESTONE
- 5. LIGHT BROWN TO GRAY SILTY SAND WITH FEW TO SOME LIMESTONE FRAGMENTS AND SHELL FRAGMENTS (A-1-b, A-2-4)
- 5A. LIGHT BROWN TO GRAY SILT WITH TRACE TO FEW LIMESTONE FRAGMENTS (A-4)
- 5B. BROWN SAND WITH SILT, TRACE TO FEW LIMESTONE FRAGMENTS (A-3)
- 5C. LIGHT BROWN SILTY SAND AND SOME SHELL FRAGMENTS (A-1-i, b)

NOTES

- ∇ GROUNDWATER LEVEL RECORDED ON THE DATE OF DRILLING.
- ONE: WATER TABLE NOT ENCOUNTERED WITHIN THE DEPTH OF EXPLORATION.
- DRILLED BY: ANDI GARCIA / ALEXANDRE / MIGUEL LOBO
- COORDINATES INFORMATION ARE MEASURED BY HANDHELD GPS.
- STATION / OFFSET / ELEVATION INFORMATION ARE PROVIDED BY SURVEYORS
- N - STANDARD PENETRATION RESISTANCE IN BLOWS PER 12 INCHES.
- MC - NATURAL MOISTURE CONTENT (%)
- OC - FINES PASSING #200 SIEVE (%)
- (A-3) - AASHTO SOIL SYMBOL

SCALE: 1"=10'V

GCME

GCME, INC.
1733 W. STATE STREET
RIVERA BEACH, FLORIDA 33404
CERTIFICATE OF AUTHORIZATION NO. 9076
PHONE (561) 845-8727

No.	Revisions	By	Date

PALM BEACH COUNTY
ENGINEERING AND PUBLIC WORKS
ROADWAY PRODUCTION
P.O. BOX 21223, WEST PALM BEACH, FLORIDA

SCALE: N.T.S.
APPROVED: PG
DRAWN: FP
CHECKED: ZP
DATE: 09/12/23

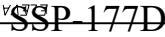
SOIL PROFILES
CR-886, SAM SENTER RD OVER SPWIND OCEAN CANAL
PROJECT NO. 2019803

SHEET:
OF:
2019803

12/14/01 PM

10/11/2022

1 page



- P. ASPHALT PAVEMENTS
1. LIGHT BROWN TO GRAY FINE TO MEDIUM SAND, SOME SHELL FRAGMENTS AND LIMEROCK GRAVELS, SOME CLAYEY SAND LENSES (A-1-N, A-2-4)
2. DARK BROWN TO BROWN SAND WITH TRACE ROOTS (A-8)(BITTUDOLI)
3. DARK BROWN TO BLACK SILTY, CLAYEY PEAT (A-9)
4. LIGHT BROWN TO GRAY SILTY, SANDY LIMESTONE, SHELL FRAGMENTS, NEARLY TO WELL CEMENTED LIMESTONE
5. LIGHT GRAY WEATHERED LIMESTONE
- 6A. LIGHT BROWN TO GRAY SILTY SAND WITH FEW TO SOME LIMESTONE FRAGMENTS AND SHELL FRAGMENTS (A-1-N, A-2-4)
- 6B. LIGHT BROWN TO GRAY SILTY SAND WITH TRACE TO FEW LIMESTONE FRAGMENTS (A-4)
- 7B. BROWN SAND WITH SILT, TRACE TO FEW LIMEROCK FRAGMENTS (A-3)
8. LIGHT BROWN SILTY SAND AND SOME SHELL FRAGMENTS (A-1-N)

- ✓ **WATER**
- **GROUNDWATER LEVEL RECORDED ON THE DATE OF DRILLING.**
- **ONE WATER TABLE NOT ENCOUNTERED WITHIN THE DEPTH OF EXPLORATION.**
- **DRIILLED BY: AND GARCIA / ALEXANDRE / MIGUEL LOBO**
- **COORDINATES INFORMATION ARE MEASURED BY HANDHELD GPS.**
- **STATION / OFFSET / ELEVATION INFORMATION ARE PROVIDED BY SURVEYORS**
- **STANDARD PENETRATION RESISTANCE IN BLOWS PER 12 INCHES.**
- **NATURAL MOISTURE CONTENT (%)**
- **FINES PASSING #200 SIEVE (%)**
- **ORGANIC CONTENT (%)**
- **ASTM#10 SOIL SWAYL**

SCALE: 1"=10'V

SSP-178D

BORING NO.
PC-16
OFFSHORE
ELEVATION
LATITUDE
LONGITUDE
HAMMER
DATE

PC-1
16+45.9
41' RT
+17.7'
26.6752°
-80.5444°
AUTOMATIC
8/16/22

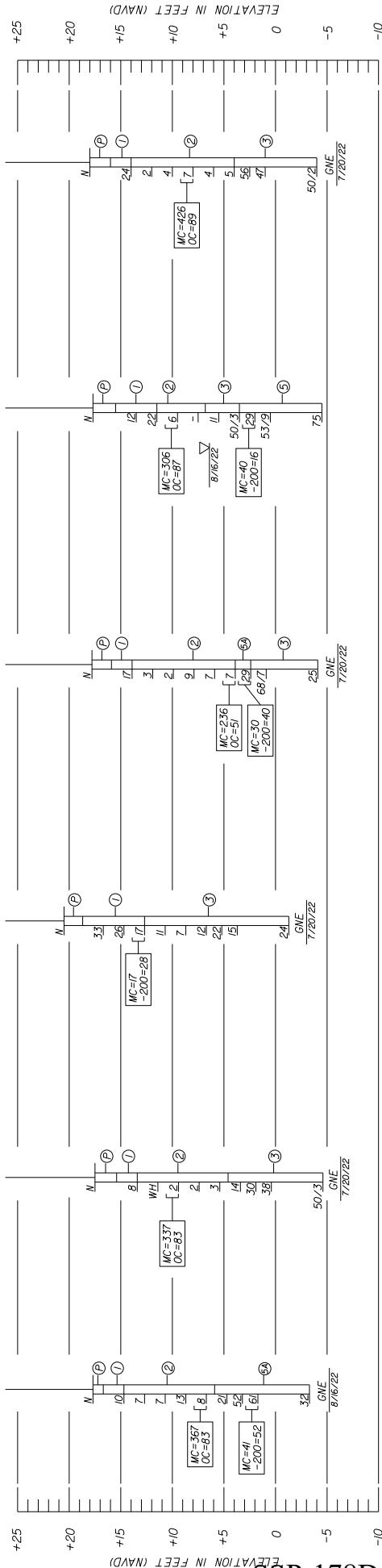
PC-2
16+45.9
81' RT
+17.5'
26.6766°
-80.5428°
AUTOMATIC
7/20/22

PC-3
16+45.9
24' LT
+20.5'
26.6780°
-80.5404°
AUTOMATIC
7/20/22

PC-4
16+45.9
100' LT
+17.8'
26.6782°
-80.5382°
AUTOMATIC
7/20/22

PC-5
16+45.9
191' LT
+17.7'
26.6782°
-80.5358°
AUTOMATIC
8/16/22

PC-6
16+45.9
191' LT
+18.0'
26.6782°
-80.5333°
AUTOMATIC
7/20/22



LEGEND

P. ASPHALT PAVEMENTS

1. LIGHT BROWN TO GRAY FINE TO MEDIUM SAND, SOME SHELL FRAGMENTS AND LIMESTONE GRAVELS, SOME CLAYEY SAND LENSES (A-1-b, A-2-4)

1A. DARK BROWN TO BROWN SAND WITH TRACE ROOTS (A-BITUMPSOIL)

2. DARK BROWN TO BLACK SILTY, CLAYEY FEAT (A-B)

3. LIGHT BROWN TO GRAY SILTY, SANDY LIMESTONE, SHELL FRAGMENTS, WEAKLY TO WELL CEMENTED LIMESTONE

4. LIGHT GRAY WEATHERED LIMESTONE

5. LIGHT BROWN TO GRAY SILTY SAND WITH FEW TO SOME LIMESTONE FRAGMENTS AND SHELL FRAGMENTS (A-1-b, A-2-4)

5A. LIGHT BROWN TO GRAY SILT WITH TRACE TO FEW LIMESTONE FRAGMENTS (A-4)

5B. BROWN SAND WITH SILT, TRACE TO FEW LIMESTONE FRAGMENTS (A-3)

5C. LIGHT BROWN SILTY SAND AND SOME SHELL FRAGMENTS (A-1-b)

NOTES

- GROUNDWATER LEVEL RECORDED ON THE DATE OF DRILLING.
- GNE: WATER TABLE NOT ENCOUNTERED WITHIN THE DEPTH OF EXPLORATION.
- DRILLED BY: ANDI GARCIA / ALEXANDRE / MIGUEL LOBO
- COORDINATES INFORMATION ARE MEASURED BY HANDHELD GPS.
- STATION / OFFSET / ELEVATION INFORMATION ARE PROVIDED BY SURVEYORS
- N - STANDARD PENETRATION RESISTANCE IN BLOWS PER 12 INCHES.
- MC - NATURAL MOISTURE CONTENT (%)
- OC - ORGANIC CONTENT (%)
- (A-3) - AASHTO SOIL SYMBOL

SCALE: 1"=10' V

GCME

GCME, INC.
1735 UNIVERSITY BLVD
RIVERIA BEACH, FLORIDA 33404
CERTIFICATE OF AUTHORIZATION NO. 9076
PHONE (561) 845-8727

No.	Revisions	By	Date

PALM BEACH COUNTY
ENGINEERING AND PUBLIC WORKS
ROADWAY PRODUCTION
P.O. BOX 2123, WEST PALM BEACH, FLORIDA

SOIL PROFILES

CR-886, SAM SENTER RD OVER SPWWD OCEAN CANAL

SHEET:
OF:
PROJECT NO.
2019803

4:03:41 PM

10/11/2022

1 page

SUPPLEMENTAL SPECIAL PROVISIONS

APPENDIX – A

USDA, SCS SOIL INFORMATION



United States
Department of
Agriculture

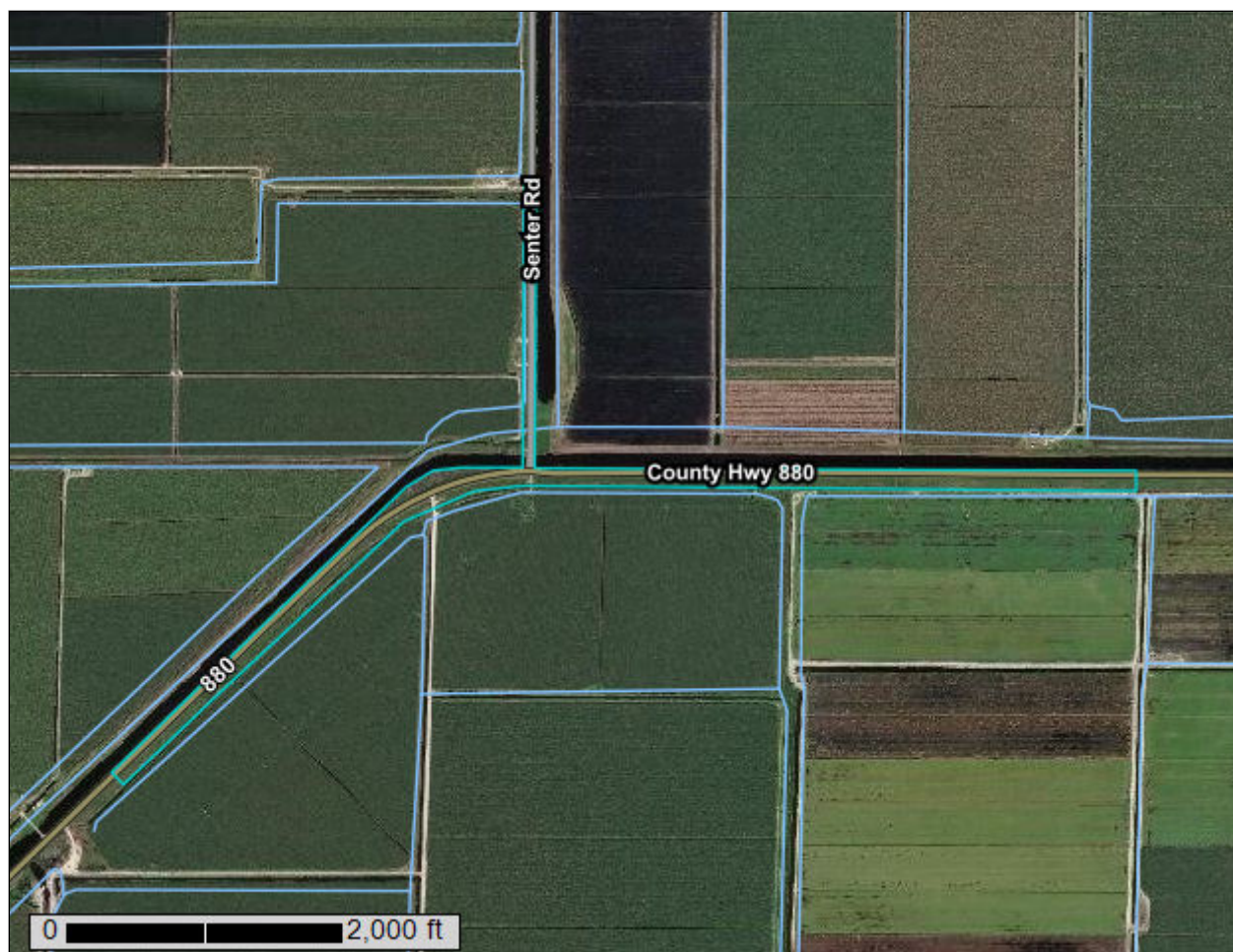
NRCS

Natural
Resources
Conservation
Service

SUPPLEMENTAL SPECIAL PROVISIONS

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Palm Beach County Area, Florida



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

SSP-188D

Custom Soil Resource Report
Soil Map

Map Scale: 1:7,780 / printed on Blankpage (17" x 11") sheet.
0 100 200 400 Meters

Soil map may not be valid at this scale.

Map Scale: 1:7,780 If printed on B landscape (17" x 11") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

9

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
43	Terra Ceia muck, drained, frequently ponded, 0 to 1 percent slopes	28.6	90.3%
99	Water	3.1	9.7%
Totals for Area of Interest		31.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

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onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

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Palm Beach County Area, Florida

43—Terra Ceia muck, drained, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2svzn

Elevation: 0 to 30 feet

Mean annual precipitation: 47 to 62 inches

Mean annual air temperature: 70 to 79 degrees F

Frost-free period: 360 to 365 days

Farmland classification: Farmland of unique importance

Map Unit Composition

Terra ceia, drained, and similar soils: 84 percent

Minor components: 16 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Terra Ceia, Drained

Setting

Landform: Depressions on marine terraces

Landform position (three-dimensional): Tread, dip

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Herbaceous organic material

Typical profile

Oa1 - 0 to 38 inches: muck

Oa2 - 38 to 80 inches: muck

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Very high (about 23.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: A/D

Forage suitability group: Organic soils in depressions and on flood plains (G156BC645FL)

Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL)

Hydric soil rating: Yes

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Minor Components

Torry, drained

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Okeelanta, drained

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Pahokee, drained

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Okeechobee

Percent of map unit: 4 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission

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rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group

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index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

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Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007 (<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties—Palm Beach County Area, Florida														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
43—Terra Ceia muck, drained, frequently ponded, 0 to 1 percent slopes														
Terra ceia, drained	84	A/D	0-38	Muck	PT	A-8	0-0-0	0-0-0	—	—	—	—	—	—
			38-80	Muck	PT	A-8	0-0-0	0-0-0	—	—	—	—	—	—

References

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SUPPLEMENTAL SPECIAL PROVISIONS

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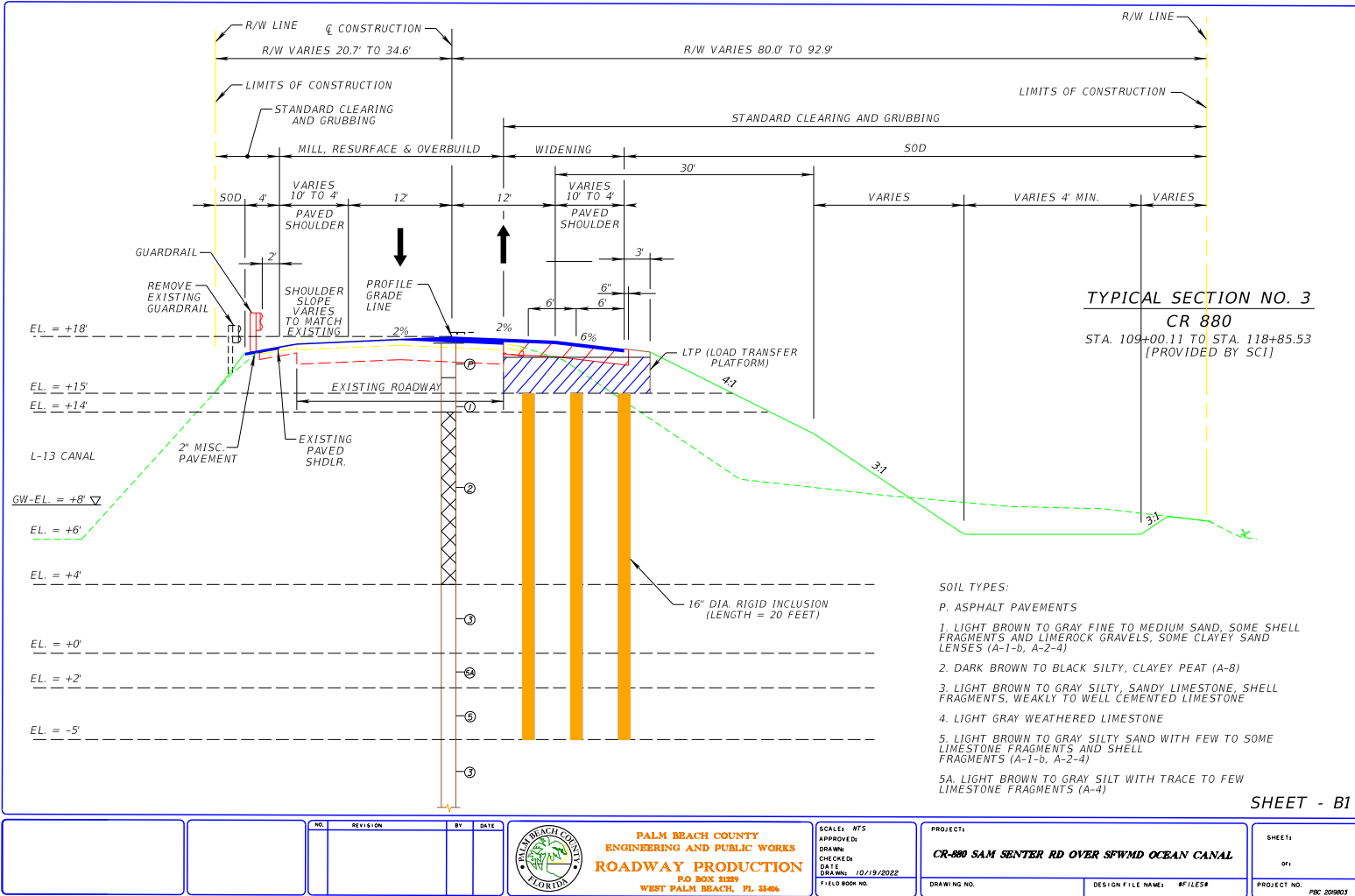
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SUPPLEMENTAL SPECIAL PROVISIONS

APPENDIX – B

SETTLEMENT ANALYSES

SUPPLEMENTAL SPECIAL PROVISIONS



SUPPLEMENTAL SPECIAL PROVISIONS

TABLE - B1

Project: CR-880: Sam Senter Road over SFWMD Ocean Canal

PBC Project No. 2019803

Summary of Settlement Analysis

Consolidation Data from Different Sample Boring	Loading Condition (Traffic Load)	Settlement [Widening section without Reinforcement] (inch)	
		Center of Existing Roadway	Center of Widening
R-108	Pavement Section [3'] and No Traffic Load [0 psf]	1.68	1.68
R-108	Pavement Section [3'] and Traffic Load [250 psf]	2.52	2.49
R-304	Pavement Section [3'] and No Traffic Load [0 psf]	2.14	2.13
R-304	Pavement Section [3'] and Traffic Load [250 psf]	3.18	3.14
B-3	Pavement Section [3'] and No Traffic Load [0 psf]	2.73	2.71
B-3	Pavement Section [3'] and Traffic Load [250 psf]	4.03	3.97

SUPPLEMENTAL SPECIAL PROVISIONS

Report created by FoSSA(2.0): Copyright (c) 2003-2012, ADAMA Engineering, Inc.

Title: CR-880
Project Number: 2000-01 - 21005
Client: SCI
Designer: ZP
Station Number:

Company's information:

Telephone #:
Fax #:
E-Mail:

Original file path and name: X:\Project 2\CR-880_PT-B-3 Widening_No-Rigid_Slope_250psf.2ST
Original date and time of creating this file: 10-04-2022

GEOMETRY: Analysis of a 2D geometry

SUPPLEMENTAL SPECIAL PROVISIONS

INPUT DATA -- FOUNDATION LAYERS -- 6 layers

	Wet Unit Weight, γ [lb/ft ³]	Poisson's Ratio μ	Description of Soil
1	120.00	0.30	Fill
2	90.00	0.40	Peat
3	130.00	0.23	Soft Limestone
4	120.00	0.40	Stiff Silt
5	110.00	0.30	Silty Limestone
6	135.00	0.23	Hard Limestone

INPUT DATA -- EMBANKMENT LAYERS -- 1 layers

	Wet Unit Weight, γ [lb/ft ³]	Description of Soil
1	120.00	Sandy Backfill

INPUT DATA OF WATER

Point #	Coordinates (X, Z) :	
	(X [ft.])	(Z [ft.])
1	0.00	8.00
2	250.00	8.00

[illegible]

INPUT DATA FOR CONSOLIDATION — $\alpha = 1/6$

Layer #		$(\sigma_p' - \sigma_o')$		Cc	Cr	e0	Cv	Drains at :
Underging		given at layer's						
Consolidation		boundaries in [lb/ft²]					[ft ²/day]	
[Yes/No]		at Top	Bottom					
1	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Yes	2420.0	1760.0	4.470	0.640	7.418	0.0720	Top & Bot.
3	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Note: Final Z is calculated assuming only 'Immediate Settlement' exists.

IMMEDIATE SETTLEMENT, Si

Node #	Settlement along section:		Layer	Young's Modulus, E	Poisson's Ratio, μ	Settlement of each layer, Si(k)	Initial Z	Final Z *	Total Settlement Sum of Si(k),
	X	Y	(k)						
	[ft.]	[ft.]		[lb/ft ²]		[ft.]	[ft.]	[ft.]	[ft.]
25	106.40	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0484			
			3	7200000	0.2300	0.0003			
			4	2000000	0.4000	0.0004			
			5	450000	0.3000	0.0030			
			6	72000000	0.2300	0.0002			
26	108.00	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0487			
			3	7200000	0.2300	0.0003			
			4	2000000	0.4000	0.0004			
			5	450000	0.3000	0.0030			
			6	72000000	0.2300	0.0002			
27	109.60	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0491			
			3	7200000	0.2300	0.0003			
			4	2000000	0.4000	0.0004			
			5	450000	0.3000	0.0029			
			6	72000000	0.2300	0.0002			
28	111.20	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0494			
			3	7200000	0.2300	0.0003			
			4	2000000	0.4000	0.0004			
			5	450000	0.3000	0.0028			
			6	72000000	0.2300	0.0002			
29	112.80	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0495			
			3	7200000	0.2300	0.0003			
			4	2000000	0.4000	0.0004			
			5	450000	0.3000	0.0027			
			6	72000000	0.2300	0.0002			
30	114.40	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0492			
			3	7200000	0.2300	0.0002			
			4	2000000	0.4000	0.0003			
			5	450000	0.3000	0.0025			
			6	72000000	0.2300	0.0002			
31	116.00	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0484			
			3	7200000	0.2300	0.0002			
			4	2000000	0.4000	0.0003			
			5	450000	0.3000	0.0024			
			6	72000000	0.2300	0.0002			
32	117.60	0.00	1	750000	0.3000	0.0006	15.00	14.95	0.05
			2	60000	0.4000	0.0461			
			3	7200000	0.2300	0.0002			
			4	2000000	0.4000	0.0003			
			5	450000	0.3000	0.0022			
			6	72000000	0.2300	0.0002			

*Note: Final Z is calculated assuming only 'Immediate Settlement' exists.

IMMEDIATE SETTLEMENT, Si

Node #	Settlement along section:		Layer	Young's Modulus, E	Poisson's Ratio, μ	Settlement of each layer, Si(k)	Initial Z	Final Z *	Total Settlement Sum of Si(k),
	X	Y	(k)	[lb/ft ²]		[ft.]	[ft.]	[ft.]	[ft.]
41	132.00	0.00	1	750000	0.3000	-0.0000	15.00	15.00	-0.00
			2	60000	0.4000	-0.0052			
			3	7200000	0.2300	0.0000			
			4	2000000	0.4000	0.0000			
			5	450000	0.3000	0.0005			
			6	72000000	0.2300	0.0001			

*Note: Final Z is calculated assuming only 'Immediate Settlement' exists.

ULTIMATE SETTLEMENT, Sc

Node #	X [ft.]	Y [ft.]	Original Z [ft.]	Settlement Sc [ft.]	Final Z * [ft.]
1	68.00	0.00	15.00	0.06	14.94
2	69.60	0.00	15.00	0.10	14.90
3	71.20	0.00	15.00	0.14	14.86
4	72.80	0.00	15.00	0.18	14.82
5	74.40	0.00	15.00	0.23	14.77
6	76.00	0.00	15.00	0.25	14.75
7	77.60	0.00	15.00	0.26	14.74
8	79.20	0.00	15.00	0.27	14.73
9	80.80	0.00	15.00	0.28	14.72
10	82.40	0.00	15.00	0.28	14.72
11	84.00	0.00	15.00	0.28	14.72
12	85.60	0.00	15.00	0.28	14.72
13	87.20	0.00	15.00	0.28	14.72
14	88.80	0.00	15.00	0.28	14.72
15	90.40	0.00	15.00	0.28	14.72
16	92.00	0.00	15.00	0.28	14.72
17	93.60	0.00	15.00	0.28	14.72
18	95.20	0.00	15.00	0.28	14.72
19	96.80	0.00	15.00	0.28	14.72
20	98.40	0.00	15.00	0.28	14.72
21	100.00	0.00	15.00	0.28	14.72
22	101.60	0.00	15.00	0.28	14.72
23	103.20	0.00	15.00	0.28	14.72
24	104.80	0.00	15.00	0.28	14.72
25	106.40	0.00	15.00	0.28	14.72

*Note: Final Z is calculated assuming only 'Ultimate Settlement' exists.

ULTIMATE SETTLEMENT, S_c

Node #	X [ft.]	Y [ft.]	Original Z [ft.]	Settlement Sc [ft.]	Final Z * [ft.]
26	108.00	0.00	15.00	0.28	14.72
27	109.60	0.00	15.00	0.28	14.72
28	111.20	0.00	15.00	0.28	14.72
29	112.80	0.00	15.00	0.28	14.72
30	114.40	0.00	15.00	0.27	14.73
31	116.00	0.00	15.00	0.27	14.73
32	117.60	0.00	15.00	0.26	14.74
33	119.20	0.00	15.00	0.24	14.76
34	120.80	0.00	15.00	0.21	14.79
35	122.40	0.00	15.00	0.18	14.82
36	124.00	0.00	15.00	0.16	14.84
37	125.60	0.00	15.00	0.13	14.87
38	127.20	0.00	15.00	0.11	14.89
39	128.80	0.00	15.00	0.08	14.92
40	130.40	0.00	15.00	0.06	14.94
41	132.00	0.00	15.00	0.03	14.97

*Note: Final Z is calculated assuming only 'Ultimate Settlement' exists.

SUPPLEMENTAL SPECIAL PROVISIONS

TABULATED GEOMETRY: INPUT OF FOUNDATION SOILS

Found. Soil #	Point #	Coordinates (X, Z) :		DESCRIPTION
		(X) [ft.]	(Z) [ft.]	
1	1	50.00	6.00	Fill
	2	66.00	14.00	
	3	68.00	15.00	
	4	100.00	15.00	
	5	132.00	15.00	
	6	136.00	14.00	
	7	150.00	10.50	
2	1	50.00	6.00	Peat
	2	66.00	14.00	
	3	136.00	14.00	
	4	150.00	10.50	
3	1	50.00	4.00	Soft Limestone
	2	150.00	4.00	
4	1	50.00	0.00	Stiff Silt
	2	200.00	0.00	
5	1	0.00	-2.00	Silty Limestone
	2	250.00	-2.00	
6	1	0.00	-5.00	Hard Limestone
	2	250.00	-5.00	

TABULATED GEOMETRY: INPUT OF EMBANKMENT SOILS

Embank. Soil #	Point #	Coordinates (X, Z) :		DESCRIPTION
		(X) [ft.]	(Z) [ft.]	
1	X1 = 68.00 [ft]	1	68.00	Sandy Backfill
	X2 = 132.00 [ft]	2	74.00	
		3	74.01	
		4	90.00	
		5	101.50	
		6	119.99	
		7	120.00	
		8	132.00	

PROPOSAL FORM

(COMPANY NAME)

(COMPANY ADDRESS)

(COMPANY CITY & STATE)

(COMPANY ZIP CODE)

CONTACT NAME _____

PHONE NUMBER _____

FACSIMILE NUMBER _____

EMAIL ADDRESS _____

FEDERAL TAX I.D. #

DATE SUBMITTED

FOR THE CONSTRUCTION OF:

**CR-880 and Sam Senter Road over the South Florida Water
Management District (SFWMD) Ocean Canal Intersection
Improvements and Bridge Replacement.
PALM BEACH COUNTY PROJECT NO. 2019803**

TO THE BOARD OF COUNTY COMMISSIONERS OF
PALM BEACH COUNTY, FLORIDA:

We, the undersigned (Contractor), hereby declare that no person or persons, firm or corporation, other than the undersigned, are interested in this Proposal as principals, and that this Proposal is made without collusion with any person, firm, or corporation, and that we are not on the Scrutinized Companies List as stated on page SC-1, and we have carefully and to our full satisfaction examined the Contract Documents, and that we have made a full examination of the location of the proposed Work and the source of supply of Materials, and we hereby agree to furnish and pay for all necessary labor, Equipment, Materials and services, fully understanding that the quantities shown herein are approximate only and that we will fully complete all Work in accordance with the Contract Documents and the requirements under them of the Engineer, within the time limit specified in this Proposal for the following unit prices, to wit:

BID PROPOSAL
CR880 AND SAM SENTER ROAD OVER THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT
(SFWMD) OCEAN CANAL INTERSECTION IMPROVEMENTS AND BRIDGE REPLACEMENT
CONTRACT
PBC PROJECT # 2019803

#		ITEM DESCRIPTION	QTY.	UNITS	UNIT PRICE	AMOUNT
ROADWAY ITEMS						
1	101-1	Mobilization	1	LS		\$ -
2	102-1	Maintenance of Traffic	1	LS		\$ -
3	104-0	NPDES Compliance (FDOT Index 101-105)	1	LS		\$ -
4	110-1-1	Clearing and Grubbing	1.00	LS		\$ -
5	120-1	Regular Excavation	15,111	CY		\$ -
6	120-5	Canal Excavation	6,432	CY		\$ -
7	120-6	Embankment (Compacted In Place)	39,223	CY		\$ -
8	N/A	Canal Embankment (Compacted In Place)	107	CY		\$ -
9	N/A	Compacted Subgrade (98% T-180) (12")	3,996	SY		\$ -
10	160-4	Type B Stabilization (LBR 40) (12")	18,399	SY		\$ -
11	285-707	Optional Base Group 7	16,888	SY		\$ -
12	285-713	Optional Base Group 13	3,333	SY		\$ -
13	327-70-1	Mill Existing Asphalt Pavement (1")	3,893	SY		\$ -
14	334-1-13	Superpave Asphalt Concrete (Traffic C)	1,668	TN		\$ -
15	339-1	Miscellaneous Asphalt Pavement (2" Thick)	287	TN		\$ -
16	334-1-13	Structural Overbuild Type SP (Traffic C)	326	TN		\$ -
17	337-7-82	Asph. Concrete Friction Course (1.0") (Type FC-9.5)	1,326	TN		\$ -
18	337-7-82	Asph. Concrete Friction Course (1.75") (Type FC-9.5)	20	TN		\$ -
19	400-0-11	Concrete Class NS (Gravity Wall)	45	CY		\$ -
20	430-175-118	Pipe Culvert (18")	36	LF		\$ -
21	425-1-549	Control Structures (Ditch Bottom Inlet Type D) (Special)	2	EA		\$ -
22	425-1-589	Control Structures (Ditch Bottom Inlet Type H) (Special)	1	EA		\$ -
23	430-982-125	Mitered End Section 18" (2:1)	3	EA		\$ -
24	N/A	Rigid Inclusions	148,642	SF		\$ -
25	145-71	Geotextile Geogrid Reinforcement Type R-2	33,032	SY		\$ -
26	521-72-40	Shoulder Concrete Barrier	77	LF		\$ -
27	521-8-7	Concrete Barrier with Junction Slab	103	LF		\$ -
28	536-1-1	Roadway Guardrail	7,463	LF		\$ -
29	536-73	Guardrail Removal	4,550	LF		\$ -
30	536-7-1	Special Guardrail Post	676	EA		\$ -
31	536-8-112	Guardrail Attachment to Barrier - Approach Trans to Rigid Barrier	3	EA		\$ -
32	536-85-24	Guardrail End Treatment - Parallel Approach Terminal	3	EA		\$ -
33	536-85-20	Guardrail End Treatment - Trailing Anchorage	5	EA		\$ -
34	N/A	SFWMD 20' Width Vehicle Barrier Gate	1	EA		\$ -
35	530-3-3	Rip-Rap (Rubble)	3,030	TN		\$ -
36	530-74	Bedding Stone (Sect. 530)	804.3	TN		\$ -

BID PROPOSAL
CR880 AND SAM SENTER ROAD OVER THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT
(SFWMD) OCEAN CANAL INTERSECTION IMPROVEMENTS AND BRIDGE REPLACEMENT
CONTRACT
PBC PROJECT # 2019803

#		ITEM DESCRIPTION	QTY.	UNITS	UNIT PRICE	AMOUNT
37	570-1-2	Sodding	24,926	SY		\$ -
38	571-1-11	Plastic Erosion Mat, Turf Reinforced, Type 1	3,329	SY		\$ -
SUBTOTAL (ROADWAY)						\$ -
STRUCTURAL ITEMS						
39	110-3	Removal of Existing Structure	3,989	SF		\$ -
40	400-2-4	Class II Structural Concrete (Flat Slab)	297	CY		\$ -
41	400-4-5	Class IV Structural Concrete (Substructure)	236	CY		\$ -
42	400-2-10	Class II Structural Concrete (Approach Slab)	123	CY		\$ -
43	400-2-47	Concrete Class II Topping (Overlay)	83	CY		\$ -
44	400-7-1	Bridge Deck Grooving	827	SY		\$ -
45	400-9-1	Bridge Deck Planing	827	SY		\$ -
46	415-1-4	Reinforcing Steel (Superstructure)	85,303	LB		\$ -
47	415-1-5	Reinforcing Steel (Substructure)	20,444	LB		\$ -
48	415-1-9	Reinforcing Steel (Approach Slab)	13,153	LB		\$ -
49	400-148	Plain Neoprene Bearing Pads	35	CF		\$ -
50	450-8-11	Florida Slab Beam New/Widening (50" x 12")	424	LF		\$ -
51	450-8-13	Florida Slab Beam New/Widening (55" x 12")	229	LF		\$ -
52	455-34-3	Structural Concrete (18" Prestressed Piles)	3,959	LF		\$ -
53	455-143-3	Test Piles (18" Prestressed Piles)	551	LF		\$ -
54	458-1-11	Bridge Deck Expansion Joints	331	LF		\$ -
55	521-5-13	Concrete Traffic Railing Bridge (36" Single-Sloped)	347	LF		\$ -
56	400-72	8" Precast Concrete Panels	3,326	SF		\$ -
SUBTOTAL (STRUCTURAL)						\$ -
CONTINGENCY ITEMS						
57	102-14	Traffic Control Officer (Non-MOT)	10	HR		\$ -
58	102-99	Changeable Variable Message Sign (Non-MOT)	1	ED		\$ -
59	121-70	Flowable Fill	30	CY		\$ -
60	455-17-118	Pre-Planned Pile Splice, Concrete Square, (18")	20	EA		\$ -
61	550-10-212	Type B Fence (4' Hight) (w/Top Rail) (Green Vinyl Clad)	1,465	LF		\$ -
62	550-10-218	Remove And Reset Silt Fence, Type B	1,000	LF		\$ -
63	550-10-210	Temporary Fencing	2,500	LF		\$ -
64	1050-115	Support & Protect Existing Utility & Appurtenances (>12")	500	LF		\$ -
SUBTOTAL (CONTINGENCY)						\$ -
TOTAL BID						\$ -

THE COUNTY DOES NOT GUARANTEE THE ACCURACY OF THE FORMULAS AND EXTENSIONS USED IN THIS SPREADSHEET.

THE ITEMS AND QUANTITIES ABOVE, SHALL GOVERN OVER THE PLANS.

PAY ITEM FOOTNOTES IN CONSTRUCTION PLANS SHALL ALSO BE INCLUDED IN ITEM UNIT PRICE.

Note #	FDOT Item #	PAY ITEM FOOTNOTES
1	All	All items shall include cost to furnish and install unless otherwise noted.
2	All	FDOT Item numbers are for reference only.
3	All	The cost of Class 5 Concrete finish is incidental to the cost of the concrete in which the finish is being applied to. See sheet B-4 for Concrete Surface Finish notes.
4	120-4	Subsoil Excavation (Inclusion Piles Spoils Disposal) shall be incidental to the Rigid Inclusions pay item.
5	N/A	SFWMD 20' Width Vehicle Barrier Gate - Refer to SFWMD Permit for detail, included.
6	101-1	FPL Transmission Line Coordination with is incidental to the Mobilization Pay Item

BID PROPOSAL
CR880 AND SAM SENTER ROAD OVER THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT
(SFWMD) OCEAN CANAL INTERSECTION IMPROVEMENTS AND BRIDGE REPLACEMENT
CONTRACT
PBC PROJECT # 2019803

#		ITEM DESCRIPTION	QTY.	UNITS	UNIT PRICE	AMOUNT
7	455-34-3	Pile Holes are incidental to the Pile Pay Item.				

PROPOSAL FORM

PROJECT NO. 2019803

TOTAL BID

\$

IN FIGURES

The Contractor acknowledges that Addenda _____ thru _____ have been received and that related costs are reflected in the submitted bid. Contractor has committed to _____% ***SBE participation*** as set forth on the Schedule 1 and Schedule 2 that are completed and submitted by Contractor. Contractor shall comply with said goal if awarded the Contract.

The Contractor hereby certifies and agrees that the following information is correct: In preparing its response to the Solicitation, the Contractor has considered all proposals submitted from qualified, potential Subcontractors and suppliers, and has not engaged in "discrimination" as defined in the County's Commercial Nondiscrimination Policy as set forth in Resolution R2025-0748 as amended, to wit: discrimination in the solicitation, selection or commercial treatment of any Subcontractor, vendor, supplier or commercial customer on the basis of race, color, national origin, religion, ancestry, sex, age, marital status, familial status, sexual orientation, disability, or genetic information, or on the basis of any otherwise unlawful use of characteristics regarding the vendor's, supplier's or commercial customer's employees or owners; provided that nothing in this policy shall be construed to prohibit or limit otherwise lawful efforts to remedy the effects of discrimination that have occurred or are occurring in the County's relevant marketplace of Palm Beach County. Without limiting the foregoing, "discrimination" also includes retaliating against any person or other entity for reporting any incident of "discrimination." Without limiting any other provision of the solicitation, it is understood and agreed that, if this certification is false, such false certification will constitute grounds for the County to reject the proposal submitted by the Contractor for this Solicitation, and to terminate any contract awarded based on the response. As part of its proposal, the Contractor shall provide to the County a list of all instances within the immediate past four (4) years where there has been a final adjudicated determination in a legal or administrative proceeding in the State of Florida that the Contractor discriminated against its Subcontractors, vendors, suppliers or commercial customers, and a description of the status or resolution of that complaint, including any remedial action taken. As a condition of submitting a proposal to the County, the Contractor agrees to comply with the County's Commercial Nondiscrimination Policy as described in Resolution R2025-0748, as amended.

The Contractor further agrees to perform all force account Work, as provided for in the General Provisions, and to execute the Contract and return to the County, along with a Contract Bond and Certificate of Insurance within fourteen (14) Working Days of the date of the Letter of Intent to Award and to commence Work with adequate forces and Equipment within fourteen (14) Calendar Days of the date set forth in the Notice to Proceed and to fully complete all contracted Work under the same in accordance with Contract Documents within the Contract Time.

PROPOSAL FORM

THE TIMELY COMPLETION OF THIS PROJECT IS CRITICAL TO THE HEALTH, SAFETY AND WELFARE OF THE TRAVELING PUBLIC. It is the desire of Palm Beach County to expedite the construction and opening to traffic of the project. The Contractor shall be required to work such hours, weekends and/or Holidays to meet the required Contract schedules.

The Contractor shall complete in full all Work under this Contract within not more than seven hundred thirty (730) Calendar Days (Contract Time). It is further agreed that should the Contractor fail to complete all Work under this Contract within the Contract Time; then, due to the criticalness of the timely completion of this project, liquidated damages for failure to meet these provisions shall be in accordance with Section 8 of the General Provisions.

The Contractor further agrees to furnish a sufficient and satisfactory Bond, on the form herein provided, in the sum of not less than 100% of the Contract price of the Work as indicated by the approximate quantities shown herein.

The Contractor further agrees to bear the full cost of maintaining all Work until the final acceptance, as provided in the Contract Documents.

Accompanying this Proposal is a Proposal Guaranty (Bid Bond) made payable to Palm Beach County, a Political Subdivision of the State of Florida, in the sum of 5% of amount Bid which is to be forfeited as liquidated damages if, in case this Proposal is accepted, the undersigned should fail to execute the attached Contract under the conditions of this Proposal. Otherwise, the Bid Bond is to be returned to the Contractor upon the delivery of a satisfactory Contract Bond.

Company Name:	_____	Authorized Officer:	_____
			(Print)
Address:	_____	Signature:	_____

PROPOSAL FORM

CONTRACTOR CERTIFICATION

PALM BEACH COUNTY

ENGINEERING AND PUBLIC WORKS DEPARTMENT

NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES

FROM

ROADWAY CONSTRUCTION SITES

CR-880 and Sam Senter Road over the South Florida Water Management District (SFWMD)
Ocean Canal Intersection Improvements and Bridge Replacement.

PALM BEACH COUNTY PROJECT NO. 2019803

“I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.”

Name of Contracting Firm: _____

By: _____ Date: _____

Name and Title: _____

Address or P.O. Box: _____

City State Zip Code

Telephone: _____
Area Code Number