City of Doral
ITB No. 2022-22
NW 58th Street Outfall
Addendum No. 1

Below are questions/ clarifications that were received regarding this project as well as the City's responses. This Addendum is and does become a part of the above-mentioned solicitation. This addendum is issued to modify the subject solicitation as follows:

1. Can I participate in this ITB with a General Contractor License?
   - No. Please refer to solicitation for required licenses.

2. Please provide engineer's estimate/budget for the above referenced project.
   - Phase I = $467,808
   - Phase II = $499,880
   - Not inclusive of MOT, Swept, Mobilization.
   - Project Overview (Pg. 3)

     The City of Doral desires to retain the services of a qualified and licensed Contractor, or a Certified Engineering Contractor to construct stormwater drainage improvements along NW 57th Street between NW 79th Avenue and NW 78th Avenue (Known as Phase I) and along NW 79th Avenue between NW 57th Street to NW 58th Street to construct along the NW 58th Street canal bank a 48" Outfall to discharge from the south bank of the NW 58th Street Canal (Known as ~~Phase I~~ **Phase II**).

3. Page 3 of ITB No.2022-22 Scope of Services, says an underground utility and excavation license is required for this project. However, per FS 489.113(3)(d), a general contractor is allowed to complete the job. The section reads as follows "a general contractor shall not be required to subcontract the construction of a main sanitary sewer collection system, storm collection system, or water distribution system, not including utility lines from the mains to the buildings and may perform any of the services on public or private property, for which a license as an underground utility and excavation contractor is required under this part". Please advise.
   - Only the licenses listed within ITB will be considered.

4. With suppliers not holding quoted prices, would the City consider an escalation clause in their contract?
   - Upon contract award the contractor is encouraged to immediately procure all materials accordingly. The schedule of values will include an item for furnished/stored/delivered materials.

5. Due to current supply chain issues, will completion dates and construction duration be adjusted accordingly?
   - The City is not opposed to adjusting project dates as long as requests are properly documented in a timely manner.

6. Is a Geo Tech report available?
   - Please see attached below.

7. Updated Davis Bacon Wages – 2022
   "General Decision Number: FL20220178 02/25/2022

Superseded General Decision Number: FL20210178
State: Florida
Construction Type: Highway
County: Miami-Dade County in Florida.

HIGHWAY CONSTRUCTION PROJECTS
Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658.
Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at https://www.dol.gov/agencies/whd/government-contracts.

Modification Number	Publication Date
0	01/07/2022

1 02/25/2022

ELEC0349-002 09/01/2021

	Rates	Fringes
ELECTRICIAN	$ 37.61	11.72

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* SUFL2013-039 08/19/2013

	Rates	Fringes
CARPENTER	$ 17.84	0.00
CEMENT MASON/CONCRETE FINISHER, Includes Form Work	$ 15.49	0.00
FENCE ERECTOR	$ 12.82 **	0.00
HIGHWAY/PARKING LOT STRIPING: Operator (Striping Machine)	$ 15.07	0.00
HIGHWAY/PARKING LOT STRIPING: Painter	$ 12.13 **	0.00
HIGHWAY/PARKING LOT STRIPING: Operator (Spray Nozzleman)	$ 11.16 **	0.00
INSTALLER - GUARDRAIL	$ 13.43 **	0.00
IRONWORKER, ORNAMENTAL	$ 13.48 **	0.00
IRONWORKER, REINFORCING	$ 18.43	0.00
IRONWORKER, STRUCTURAL	$ 16.42	0.00
LABORER (Traffic Control Specialist incl. placing of cones/barricades/barrels - Setter, Mover, Sweeper)	$ 11.59 **	0.00
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 12.31 **	0.00
LABORER: Common or General	$ 10.69 **	0.00
LABORER: Flagger	$ 12.53 **	0.00
LABORER: Grade Checker	$ 12.41 **	0.00
LABORER: Landscape &		

Irrigation.....$ 9.02 ** 0.00

LABORER: Mason Tender -
Cement/Concrete.....$ 13.91 ** 3.50

LABORER: Pipelayer.....$ 15.02 0.00

OPERATOR:
Backhoe/Excavator/Trackhoe.....$ 16.24 0.00

OPERATOR: Bobcat/Skid
Steer/Skid Loader.....$ 12.88 ** 0.00

OPERATOR: Boom.....$ 18.95 0.00

OPERATOR: Boring Machine.....$ 15.29 0.00

OPERATOR: Broom/Sweeper.....$ 13.01 ** 0.00

OPERATOR: Bulldozer.....$ 16.77 0.00

OPERATOR: Concrete Finishing
Machine.....$ 15.44 0.00

OPERATOR: Concrete Saw.....$ 14.43 ** 0.00

OPERATOR: Crane.....$ 22.46 0.00

OPERATOR: Curb Machine.....$ 20.74 0.00

OPERATOR: Distributor.....$ 13.29 ** 0.00

OPERATOR: Drill.....$ 14.78 ** 0.00

OPERATOR: Forklift.....$ 16.32 0.00

OPERATOR: Gradall.....$ 14.71 ** 0.00

OPERATOR: Grader/Blade.....$ 20.22 3.85

OPERATOR: Loader.....$ 15.53 0.00

OPERATOR: Mechanic.....$ 18.03 0.00

OPERATOR: Milling Machine.....$ 14.67 ** 0.00

OPERATOR: Oiler.....$ 16.32 0.00

OPERATOR: Paver (Asphalt,
Aggregate, and Concrete).....$ 13.61 ** 0.00

OPERATOR: Piledriver.....$ 17.23 0.00

OPERATOR: Post Driver
(Guardrail/Fences).....$ 14.45 ** 0.00

OPERATOR: Roller.....$ 13.67 ** 0.00

OPERATOR: Scraper.....$ 12.01 ** 0.00

OPERATOR: Screed.....$ 14.15 ** 0.00

OPERATOR: Tractor.....$ 12.19 ** 0.00

OPERATOR: Trencher.....$ 14.74 ** 0.00

PAINTER: Spray.....$ 16.52 0.00

SIGN ERECTOR.....$ 12.96 ** 0.00

TRAFFIC SIGNALIZATION:
Traffic Signal Installation.....$ 19.07 0.00

TRUCK DRIVER: Distributor
Truck.....$ 14.96 ** 2.17

TRUCK DRIVER: Dump Truck.....$ 12.19 ** 0.00

TRUCK DRIVER: Flatbed Truck.....$ 14.28 ** 0.00

TRUCK DRIVER: Lowboy Truck.....$ 15.07 0.00

TRUCK DRIVER: Slurry Truck.....$ 11.96 ** 0.00

TRUCK DRIVER: Vactor Truck.....$ 14.21 ** 0.00

TRUCK DRIVER: Water Truck.....$ 13.17 ** 1.60

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($15.00) or 13658 ($11.25). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness,

injury, or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four-letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

GEOTECHNICAL ENGINEERING REPORT

NW 58th Street Outfall Project
NW 58th Street and NW 79th Avenue
Doral, Florida

PSI Project No. 0397-1544

PREPARED FOR:

EAC Consulting, Inc.
5959 Blue Lagoon Drive, Suite 410
Miami, Florida 33126

September 19, 2020

BY:

PROFESSIONAL SERVICE INDUSTRIES, INC.
7950 NW 64th Street
Miami, Florida 33166
Phone: (305) 471–7725
Fax: (305) 593–1915

Professional Service Industries, Inc.
7950 NW 64th Street
Miami, FL 33166
Office – (305) 471-7725

September 19, 2020

EAC Consulting, Inc.
5959 Blue Lagoon Drive, Suite 410
Miami, Florida 33126

Attn: Mr. Darren Dyer, P.E. – Drainage Engineer/Project Manager

Re: Geotechnical Engineering Report
NW 58th Street Outfall Project
NW 58th Street and NW 79th Avenue
Doral, Florida
PSI Project No. 0397-1544

Dear Mr. Dyer:

Professional Service Industries, Inc. (PSI), an Intertek company, is pleased to submit this Geotechnical Engineering Report for the referenced project. This report includes the results from the field and laboratory evaluation along with recommendations for use in preparation of the appropriate design and construction documents for this project.

PSI appreciates the opportunity to provide this Geotechnical Engineering Report and looks forward to continuing participation during the design and construction phases of this project. PSI also has great interest in providing materials testing and inspection services during the construction of this project and will be glad to meet with you to further discuss how we can be of assistance as the project advances.

If there are questions pertaining to this report, or if PSI may be of further service, please contact us at your convenience.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.
Certificate of Authorization No: 3684

Lucrèce E. Regisme
Staff Engineer – Geotechnical Services

Jose N. Gómez, P.E., D.GE
Chief Engineer-Geotechnical Services
P.E.78289

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1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI), an Intertek company, has completed a field exploration and geotechnical evaluation for the NW 58th Street Outfall project in Doral, Florida. The following table provides Project Authorization information.

Table 1.1-1: Project Authorization

Project Name	NW 58th Street Outfall Project
Project Location	NW 58th Street and NW 79th Avenue, Doral, Florida
Work Order Issued By	Michael Adeife, PE – Senior Vice President
Authorization Company	EAC Consulting, Inc.
Authorization Date	July 21, 2020
Contract #	Continuous Professional Services – RFQ-2017-21-Sub-Basin H-5 Canal Study WO12
PSI Proposal Contents	Scope of Work, Lump Sum Fee, and PSI's General Conditions

1.2 PROJECT DESCRIPTION

We understand that the outfall project consists of two canals with a depth of approximately 12 to 16 feet and a total length of 1,470 feet. Based on PSI's review of the project information provided by EAC Consultants, Inc., and conversation held regarding the description of the existing conditions of the canals, a summary of our understanding of the proposed project is provided below in the following Project Description table.

Table 1.2-1: General Project Description

Project Items	Miami-Dade County is making re-establishing historical top-of-bank elevations a permitting requirement for the proposed outfall project. The existing to-of-bank and cross-sections along the existing canals with existing slopes from approximately 0.5H:1.0V to 2.0H:1.0V are proposed to be modified. Outfall project consists of two canal sectors: (1) from Sta 52+30 to Sta 57+50 (520 feet) and (2) from Sta 81+20 to Sta 90+70 (950 feet).
Existing Grade Change within Project Site	± Two feet estimate (Google Earth Pro)

The geotechnical recommendations presented in this report are based on the available project information, existing canal cross-sections, proposed cross-sections modifications by EAC Consulting Inc., and the subsurface materials encountered during the field exploration. If the noted information is incorrect, please inform PSI so that the recommendations presented in this report can be amended as necessary. PSI will not be responsible for the implementation of provided recommendations if not notified of changes in the project.

1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study is to evaluate the subsurface conditions at the site and develop geotechnical engineering recommendations and guidelines for use in preparing the design and other related construction documents associated with NW 58th Street Canals modifications for the proposed outfall project. The scope of services included drilling soil borings, performing laboratory testing, conducting slope stability analysis and preparing this geotechnical engineering report.

This report briefly outlines the available project information, describes the site and subsurface conditions, and presents the recommendations regarding the six Standard Penetration Testing (SPT) drilled to depths of 40 feet below existing grades within the vicinity of the existing canals as shown in **Figure 2**, **Appendix A**. It is also shown in this figure, the location of six cross sections along the canal that were utilized to carry out the slope stability analyses. The six cross sections provided by EAC Consulting Inc. for the stability analyses are included as Sheets C-0.1 at the end of **Appendix A**.

The scope of services for this geotechnical exploration did not include an environmental, mold nor detailed seismic/fault assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on or below, or around this site. Statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

2.0 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

The following table provides a generalized description of the existing site conditions based on visual observations during the field activities, as well as other available information (refer to **Figure 1**, Site Vicinity Map, **Appendix A**).

Table 2.1-1: Site Description

Site Location	The site is located within the northwest quadrant of Palmetto expressway and NW 58th Street in Doral, Florida.
Site History	Based on our review of Google Earth Pro Aerial Photographs from 1994 through 2020, the site appears to have been developed with the existing canals and roads.
Existing Site Ground Cover	Grass.
Existing Grade/Elevation Changes	Approximately EL +5.0 to +6.0 feet (Google Earth Pro).
Description of Adjacent Property	North boundary: NW 77th Court. East Boundary: Palmetto Expressway. South Boundary: NW 58th Street. West boundary: Existing canal.

2.2 SITE PHOTOS

The following photograph shows the project area for the proposed two canals for which the cross-section geometries are to be modified. The exploration soil borings were conducted within the area in red, please see **Figure 2**, **Appendix A**, for the Boring Location plan.

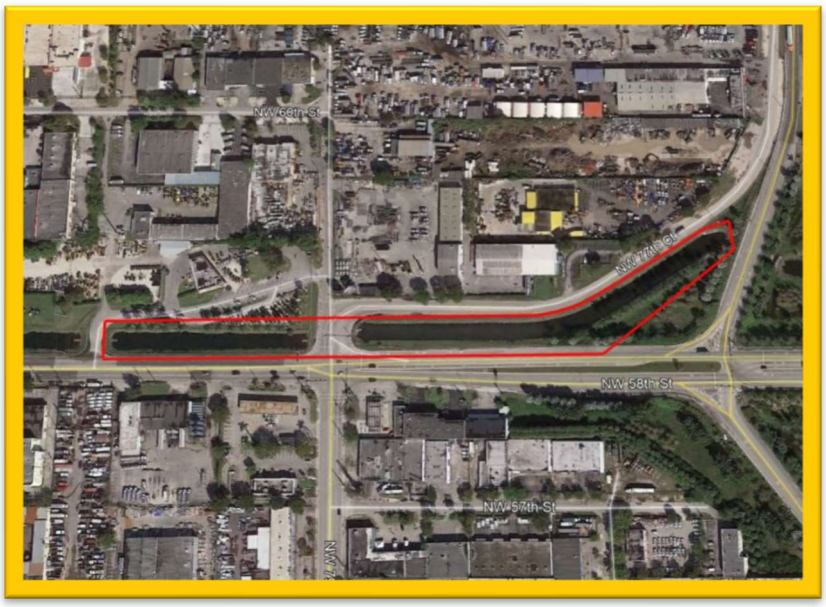


Figure 2.2-1: Aerial photograph of the Project Area

2.3 FIELD EXPLORATION

Field exploration for the NW 58th Street Outfall Project consisted of drilling a total of six SPT borings (three borings within the straight canal and three borings within the arc-curved canal). The boring design element, boring labels, approximate depths and drilling footage are provided in the following table.

Table 2.3-1: Field Exploration Summary

Design Element	Number of Borings	Boring Depth (ft)	Drilling Footage (feet)
Canals	6	40	240
		TOTAL:	**240**

The boring locations were selected and located in the field by PSI using a recreational-grade GPS system. Elevations of the ground surface at the boring locations were not provided and should be surveyed by others prior to construction. The references to elevations of various subsurface strata are based on depths below existing grade at the time of drilling. The approximate boring locations are depicted on the Boring Location Plan provided in **Figure 2**, **Appendix A**. The following table summarizes the characteristics of the field exploration and drilling.

Table 2.3-2: Field Exploration Description

Drilling Equipment	Truck Mounted Drilling Rig
Drilling Method	Mud-Rotary with casing
Drilling Procedure	Applicable ASTM and PSI Safety Manual
Field Testing	Standard Penetration Test (ASTM D1586)
Sampling Procedure	ASTM D1587/1586
Sampling Frequency	Continuously to a Depth of 10 Feet and at five-foot Intervals Thereafter
Frequency of Groundwater Level Measurements	During Drilling
Boring Backfill Procedures	Grouting

During field activities, the encountered subsurface conditions were observed, logged, and visually classified (in general accordance with ASTM D2487). Field notes were maintained to summarize soil types and descriptions, water levels, changes in subsurface conditions, and drilling conditions.

2.4 LABORATORY TESTING PROGRAM

The soil samples recovered from the borings were visually reviewed in the laboratory by a geotechnical engineer to confirm the field classifications. The samples were classified using the Unified Soil Classification System (USCS) in general accordance with the American Society of Testing and Materials (ASTM) test designation D2487. The soil classification was based on visual observations and laboratory testing.

2.5 SITE GEOLOGY

South Florida region is located on the southern flank of Florida Plateau, a stable, carbonate platform on which thick deposits of limestones, dolomites, and evaporates have accumulated; these deposits and associated geological formations were deposited during the Pleistocene epoch. The general geology of the upper 200 feet of this platform within the area of South Florida where the proposed project is to be located is composed predominantly of limestone and quartz sand. The geological formations that usually are encountered from top to bottom within Miami-Dade County are the Pamlico Formation (sands and organic silt and peat), Miami Formation within the upper 20 to 50 feet (oolitic limestone) and Fort Thompson Formation within depths intervals of 50 to 500 feet (intercalations of sand with limestone and cemented sand with limestone and cemented sand and shell).

2.6 SUBSURFACE CONDITIONS

The results of the field and laboratory investigation have been used to generalize a subsurface profile at the project site. The following subsurface descriptions provide a highlighted generalization of the major subsurface stratification features and material characteristics based on the borings and samples visual description.

Table 2.6-1: Generalized Soil Profile Description

Stratum	Top (ft)	Bot. (ft)	Soil Type	[1]N Range	N Average	Density
-	0.0	0.5	Topsoil (six inches) as surface covers	-	-	-
1	0.5	4.0	Limerock (Crushed Limestone Fill)	5 - 22	9	Loose to Medium Dense
2A	4.0	8.0	[2]SAND (SP)	3 - 8	5	Very Loose to Loose
2B	2.0	12.5	[3]Weathered Limestone/SAND with Cemented Sand and Limestone Fragments	11 - 26	16	Medium Dense
3	12.5	37.5	SAND (SP)	6 - 32	13	Loose to Dense
4	37.5	50.0	Weathered Limestone	26 - 39	27	Medium Dense to Dense

Notes Table 2.6-1:

[1] N=Standard Penetration Test blow count (blows/foot)-See Key to Terms and Symbols Used on Logs, Appendix B

[2] SAND (layer 2A) encountered only in P-01 and P-02 around the western portion of the smaller canal west of NW 79th Avenue.

[3] Natural limestone (layer 2B) was encountered at a relatively shallow depth. The limestone formation may require the use of special equipment and breaking tools during construction excavation work and earthwork activities.

The boring logs included at the end of the **Appendix B** should be reviewed for specific information at individual boring locations. The boring logs include soil descriptions, stratifications, locations of the samples, and field and laboratory test data. The descriptions provided on the logs only represent the conditions at that actual boring location; the stratifications represent the approximate boundaries between subsurface materials. The actual transitions between strata may be more gradual and less distinct. Variations will occur and should be expected across the site. If variations in subsurface conditions from those described are noted during construction, recommendations in this report may need to be re-valuated.

2.6.1 GROUNDWATER INFORMATION

Water level measurements were performed during drilling operations. No further water measurements were conducted after drilling was finished. Specific information concerning groundwater is noted on each boring log presented in **Appendix B** of this report.

The groundwater table was measured in the boreholes at a depth of approximately 3.8 to 4.5 feet below existing grades during the drilling operations conducted in July 2020. The ground water elevation coincides in general with the water elevations in the canals. Please also note that groundwater levels fluctuate seasonally in response to rainfall, local drainage patterns and the infiltration rate of the soil. The rainy season in South Florida is normally between May and October, and usually September is the highest rainfall month. Based upon our interpretation of the SPT boring data, it appears that the seasonal high groundwater level can be found above and to a depth one and a half to two and a half feet below existing grades. If a detailed water level evaluation is required, observation wells or piezometers can be installed at the site to monitor water levels.

The groundwater levels presented in this report were measured at the time of PSI field activities in July 2020; the contractor should determine the actual groundwater levels at the site before construction activities.

3.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

3.1 GEOTECHNICAL DISCUSSION

Based on the results of our subsurface exploration, variable soil conditions were encountered along the north and south side of the canals and these conditions determine the slope inclinations of the existing canals. The canals run from west to east and they are separated by the NW 79th Avenue; please see below for a summary of the soil conditions along each canal:

a) Soil conditions along canal located West of NW 79th Avenue (Sta 52+30 to Sta 57+50)

On the western side of the smaller straight canal, the general soil conditions along the north side of the canal consist of limerock material underlain by sand from two to 32.5 feet with an interbedded layer of limestone between eight to 12.5 feet as seen in boring P-01; this interbedded limestone layer thickens as we travel east of the smaller canal and is encountered from two to 12.5 feet below grades as seen is boring P-07 close to NW 79th Avenue . The soil conditions along the south side of this canal consist of limerock underlain by sand down to 32.5 feet below grades. Along both north and south sides of the canal, weathered limestone was encountered between 32.5 to boring termination depths of 40 feet below existing grades.

b) Soil conditions along canal located East of NW 79th Avenue (Sta 81+20 to Sta 97+50)

Along the arc-curved shape canal, the general soil conditions along the north (borings P-04 and P-05) and south (boring P-03) sides of the canal consist generally of limerock underlain by limestone from two to 12.5 feet below existing grades followed by sand to 32.5 feet. Along both north and south sides of the canal, weathered limestone was encountered between 32.5 to boring termination depths of 40 feet below existing grades.

Based on our review of the obtained soil data, our soil boring results corroborates the provided existing grades-slopes cross-sections. The slopes located along the areas with the thicker layer (10 feet) of limestone appears to better maintain the 0.5H:1.0V slope due to the natural limestone's existing cohesion strength. The slopes located along the areas with smaller layer (four feet or less) of limestone appears to have failed, slid and stabilized to a 1.5H to 2.0H:1.0V slope which is also due to the presence of the thicker layers cohesionless sand material. Please refer to Sheets C-0.1 at the end of **Appendix A** for the provided cross-sections that include the existing and modified grades.

3.2 SLOPE STABILITY DISCUSSION

Slope Stability Discussion:

Slope stability analyses are performed to evaluate a slope's natural reaction to gravity, external forces and load which are called "driving forces" and the soils ability to resist these driving forces which are called "resisting forces". The ratio of the resisting forces divided by the driving forces provided the term referred to as the "factor of safety". Based on this concept, to obtain a stable condition the driving forces have to be smaller than the resisting forces and as such, safety factor must be greater than one. This factor of safety can be evaluated by many numerical types of analyses, but is primarily controlled by one of the following factors:

- Geometry of the slope,
- Physical strength parameters of the materials in the slope,

- External loads, such as water in the canal,
- Water on the slopes and within the embankment materials, and
- Time.

The geometric factors are relatively straight forward. The steeper the slope, the higher the driving forces and the lower the factor of safety. Periodic horizontal benches in the slopes have the overall effect of flattening the slope and thereby reducing the driving forces and raising the factor of safety. Conversely, flatter slopes tend to have lower relative driving forces and thereby higher factors of safety. Geometry of internal features also has an effect on the stability performance of an embankment as the physical strength of material can vary. For example, a steeply sloped embankment of high strength materials can have a higher factor of safety than a flatter sloped embankment of a lower strength embankment or one with an internal zone of weaker strength materials.

Strength Parameters. The physical strength of the materials making up the slope is one of the primary controlling features of a stability analysis. These canals are in the steady state seepage, since the slope has been in place for a sufficient amount of time, typically months to years, such that the foundations soils have fully compressed under the loading of the embankment or natural soil itself, has fully compressed of its own weight, and the pressure of the water in the pore spaces of the saturated soils is constant and consistent with flow of water within the slope itself. The strength parameters were obtained by using traditional correlations with the SPT-N values and our experience and geotechnical judgment; these parameters are as follows:

Table 3.2-1: Strength Parameters

Limerock	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	108
Cohesion [psf]	0
Friction Angle [deg]	30
Water Surface	Assigned per scenario
Hu Value	1
Very Loose SP	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	93
Cohesion [psf]	0
Friction Angle [deg]	25
Water Surface	Assigned per scenario
Hu Value	1
Med Dense Lime 1	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	108
Cohesion [psf]	250
Friction Angle [deg]	30
Water Surface	Assigned per scenario
Hu Value	1
Med Dense SP	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	103
Cohesion [psf]	0
Friction Angle [deg]	30
Water Surface	Assigned per scenario
Hu Value	1
Loose Limestone	
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	95
Cohesion [psf]	0
Friction Angle [deg]	27
Water Surface	Assigned per scenario
Hu Value	1
Med Dense Lime 2	
Color	
Strength Type	Mohr-Coulomb
Unsaturated Unit Weight [lbs/ft3]	116
Saturated Unit Weight [lbs/ft3]	116
Cohesion [psf]	0
Friction Angle [deg]	32
Water Surface	Assigned per scenario
Hu Value	1

Stability Analysis Cases. The software SLIDE by Rocscience was used to carry out the stability analyses of the canal selected and representative cross-sections. This program is a 2D slope stability program for evaluating the safety factor of circular or non-circular failure surfaces in soil or rock slopes using the modified Bishop methodology. SLIDE can handle complex models such as external loading, groundwater and support can all be modeled in a variety of ways. Strength parameters of materials follow the Mohr-Coulomb strength theory.

The concept of safety factor determines if a slope is stable or not. Theoretically speaking a safety factor greater than 1.0 provides stable conditions. Based on our experience, it is our professional opinion that a minimum safety factor of 1.5 should be used for the proposed modified grades of the canals.

Two slope geometries were considered for the analyses: (1) 1.5H:1.0V and (2) 0.5H:1.0V, which are similar to the existing conditions in the canals in an erratic manner (the slope inclination of 0.5H:1.0V is the one proposed along the entire lengths of the canals).

Considering that the soil profiles along the canals are not homogeneous, three representative cases were analyzed to each of the canal geometries described above as follows: (1) slope composed of only sand, (2) slope composed of sand and less than four feet of limestone, and (3) slope composed of about 10 feet of limestone). The last condition goes in line with the existing slopes that have steeper inclination as 0.5H:1.0V.

Finally, two conditions of water elevation were considered in the analyses: (1) current high elevation, and (2) water elevation four feet above the bottom of the canals.

Results of Stability Analysis. The following table summarizes the cases analyzed in terms of the safety factors that were obtained. These are the real safety factors that justify the actual stability of the slopes with the current water elevation. The results from the computer program are included in the **Appendix D** (in general, two slip surfaces or failure planes were considered as the most critical ones base on the soil properties)

Table 3.2-2: Results of Stability Analysis

Slope	Soil Description	Safety Factors	
		High Water EL.	Low Water EL.
0.5H:1V	Sand only	0.50 – 0.59	0.48 – 0.52
	Sand and four feet of Limestone	1.00 – 1.48	0.77 – 0.97
	10 feet of Limestone	**1.31 – 1.92**	0.93 – 1.22
1.5H:1V	Sand only	0.80	0.63

As it can be seen from the table, the conditions at which most of the slopes are stable is when the water elevation in the canals are high and when the presence of limestone is more than 10 feet (1.31 to 1.92). The water in the canal is an external load that pushes down the slope and helps to hold it stable, and on the other hand, the limestone has more strength with the additional cohesion. Note also that the 1.5H:1.0V slope inclination only with sand is unstable, which explains why many slopes have flatter slope inclination at this time, i.e, 2.0H:1.0V. Based on these results, it is not recommended to lower the water elevation in the canals, a reduction of the safety factor of about 33% could be obtained and create an unstable condition.

Slope Stability Analyses Summary:

The static factors of safety do not meet the regulatory requirements for water impounding slopes (typically 1.5); only the existing condition of 0.5H:1.0V when there are 10 feet of limestone. PSI has presented the slope stability analyses for six cross-sections along the canals in question. It is PSI's opinion that the proposed modified slope configuration of 0.5H:1.0V will be stable **only** under the case when 10 feet or more of weathered limestone is present. It is also our opinion that if the stated slope is utilized in a canal sector(s) where only sand is present, the slope will slide gradually until a slope of 1.5H to 2.0H:1.0V is reached by natural equilibrium process with time.

4.0 CONSTRUCTION CONSIDERATIONS

Having a Geotechnical Engineer retained to review the earthwork recommendations in the Contract Documents and be an active participant in team meetings near the time of construction can often result in project cost savings. Therefore, PSI recommends that an AASHTO accredited 3rd party laboratory with qualified professional engineers who specialize in geotechnical engineering be retained to provide observation and testing of construction activities involved in the earthwork, and related activities of this project. As the Geotechnical Engineer of Record, PSI's services can be retained as the 3rd party laboratory. PSI's participation would be advantageous to the project flow and value engineering during construction since we are most familiar with the existing soil conditions at the site.

The geotechnical engineer (GER) often does not have available all design information at the time of writing the original report since the report is done very early in the design process. The GER can be of great benefit immediately prior to construction since definitive information regarding the location of the surrounding flatwork, planned landscaping, and drainage features is available. The GER can then write supplement letters to the original geotechnical report often resulting in less risk and project cost savings.

PSI cannot accept responsibility for conditions which deviate from those described in this report, nor for the performance of the foundations or pavements if not engaged to also provide construction observation and materials testing for this project. The PSI geotechnical engineer of record must also be engaged by the Design Team, even if periodic on-call testing is contracted with PSI Construction Services.

4.1 INITIAL SITE PREPARATION CONSIDERATIONS

4.1.1 IN-SITU DENSIFICATION

In-situ densification of the subgrade soils when required should be performed in the proposed project areas plus a five-foot-wide perimeter extending beyond the outside edges of the construction areas, where practical. Densification should be accomplished with a self-propelled vibratory roller which imparts a dynamic force of not less than 20 tons.

To minimize the effects of compaction induced vibrations on adjacent existing structures, the compaction operations should be limited to a distance not closer than 25 feet from existing structures (subject to field adjustment as necessary). The maximum drum roller weight to be used between five to 25 feet from existing structures should be limited to four tons. For distances of less than five feet, a walk behind vibratory sled or roller should be used. Compaction of the bearing surface using this equipment should continue until no further vertical settlement of that surface is visually discernible. Any area of the exposed surface that deflects excessively under the weight of the compaction equipment should be excavated approximately 24 inches and replaced with compacted structural fill.

Density control should be exercised in the upper 12 inches of the compacted subgrade. Soils in this interval should be compacted to at least 95 percent of the Modified Proctor maximum dry density determined per ASTM D-1557. Frequent wetting of the subgrade may be necessary during the rolling operations to prevent drying and loosening of the upper six to 12 inches of soil.

4.1.2 STRUCTURAL FILL AND BACKFILL

Structural fill should be free of organic matter and consist of granular material containing less than 12 percent passing by dry weight the U.S. Standard No. 200 mesh sieve. The fill material may be composed of either clean sands and/or limerock. The fill material should have no particle size in excess of three inches and have a Unified Soil Classification System (USCS) designation of GP, GW, GP-GM, GW-GM, SP, SW, SP-SM or SW-SM.

Structural fill should be placed in level lifts not exceeding 12 inches in loose thickness. Each lift should be compacted to at least 95 percent of the Modified Proctor maximum dry density near the optimum moisture content as determined by ASTM D-1557. Fill to be compacted with a vibratory plate tamper or a small walk behind vibratory roller should be placed in lifts not exceeding six inches in loose thickness. In place density tests should be performed by a qualified soils technician working under the supervision of a geotechnical engineer in accordance with appropriate ASTM procedures. Any fill indicating less than the recommended relative compaction should be recompacted until the required density is obtained prior to the placement of subsequent fill lifts or pouring concrete for substructures.

Structural fill or backfill placed below the water table and to a height of one foot above it should consist of a combination of FDOT No. 57 Stone and structural fill material mixed in an approximate 50 percent proportion by volume. Density testing will not be required within this layer; however, the subgrade preparation work should be observed by a representative from our office to confirm that the material is in a stable and unyielding condition.

The use of a commercially available fill material by the name “Cyclone Sand” should not be permitted for the project. Cyclone sand contains large amounts of fines and is therefore very sensitive to moisture. The moisture sensitivity of the material makes it difficult to compact and achieve the desired densities.

4.2 EXCAVATION OBSERVATIONS

Excavations should be observed by a representative of PSI prior to continuing construction activities in those areas. PSI needs to assess the encountered materials and confirm that site conditions are consistent with those discussed in this report. This is especially important to identify the condition and acceptability of the exposed subgrades under foundations and other structures that are sensitive to movement. Soft or loose soil zones encountered at the bottom of the excavations should be removed to the level of competent soils as directed by the Geotechnical Engineer or their representative. Cavities formed as a result of excavation of soft or loose soil zones should be backfilled with compacted select fill or lean concrete.

After opening, excavations should be observed, and concrete should be placed as quickly as possible to avoid exposure to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. Excavations left open for an extended period of time (greater than 24 hours) should be protected to reduce evaporation or entry of moisture.

4.3 EXCAVATIONS

It should be noted that excavation equipment capabilities and field conditions may vary. Geologic processes are erratic and large variations can occur in small vertical and/or lateral distances. Details regarding “means and methods” to accomplish the work (such as excavation equipment and technique selection) are the sole responsibility of the project contractor. The comments contained in this report are based on small diameter borehole observations. The performance of large excavations may differ as a result of the differences in excavation sizes.

The Occupational Safety and Health Administration (OSHA) Safety and Health Standards (29 CFR Part 1926, Revised October 1989), require that excavations be constructed in accordance with the current OSHA guidelines. Furthermore, the State of FL requires that detailed plans and specifications meeting OSHA standards be prepared for trench and excavation retention systems used during construction. PSI understands that these regulations are being strictly enforced, and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, State, and Federal safety regulations.

PSI is providing this information as a service to the client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, State, and Federal safety or other regulations. A trench safety plan was beyond the scope of our services for this project.

5.0 REPORT LIMITATIONS

The recommendations submitted in this report are based on the available subsurface information obtained by PSI and design details furnished by EAC Consulting, Inc. for the proposed project. If there are revisions to the plans for this project, or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation recommendations are required or re-evaluated. If PSI is not notified of such changes, PSI will not be responsible for the impact of those changes on the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional Geotechnical Engineering practices in the local area. No other warranties are implied or expressed. This report may not be copied without the expressed written permission of PSI.

After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that the engineering recommendations have been properly incorporated in the design documents. At this time, it may be necessary to submit supplementary recommendations. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project.

This report has been prepared for the exclusive use of EAC Consulting, Inc. for specific application to the proposed NW 58th Street Outfall Project in Doral, Florida.

APPENDIX A

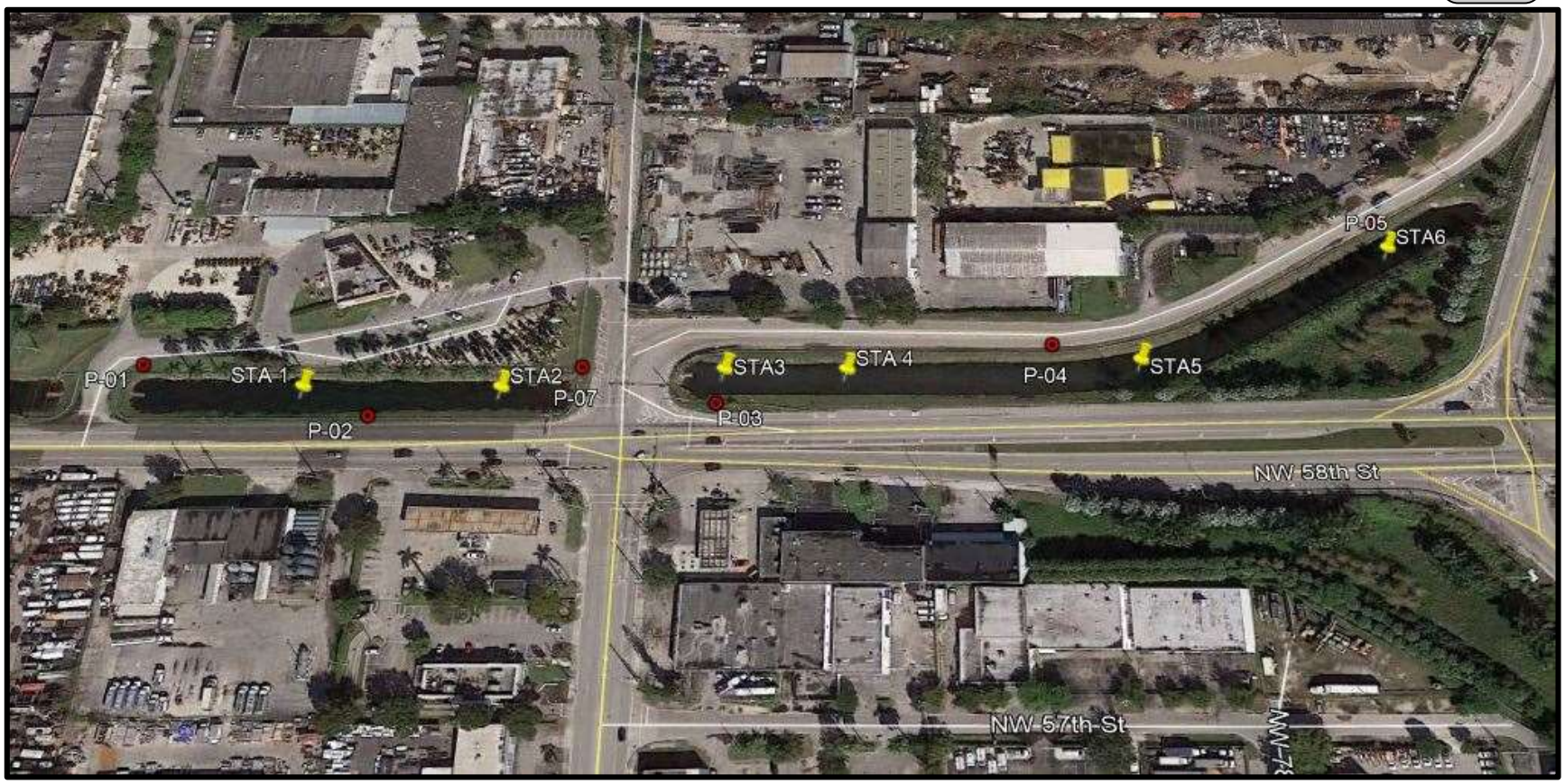
SITE VICINITY MAP

FIGURE No.:	1
DRAWN BY:	AVL
CHECKED BY:	JNG

GEOTECHNICAL ENGINEERING SERVICES
NW 58th Street Outfall Project
City of Doral
Miami-Dade County, Florida
PSI PROJECT No.: 0397-1544
DATE: 07/30/2020

intertek psi

BORING LOCATION PLAN



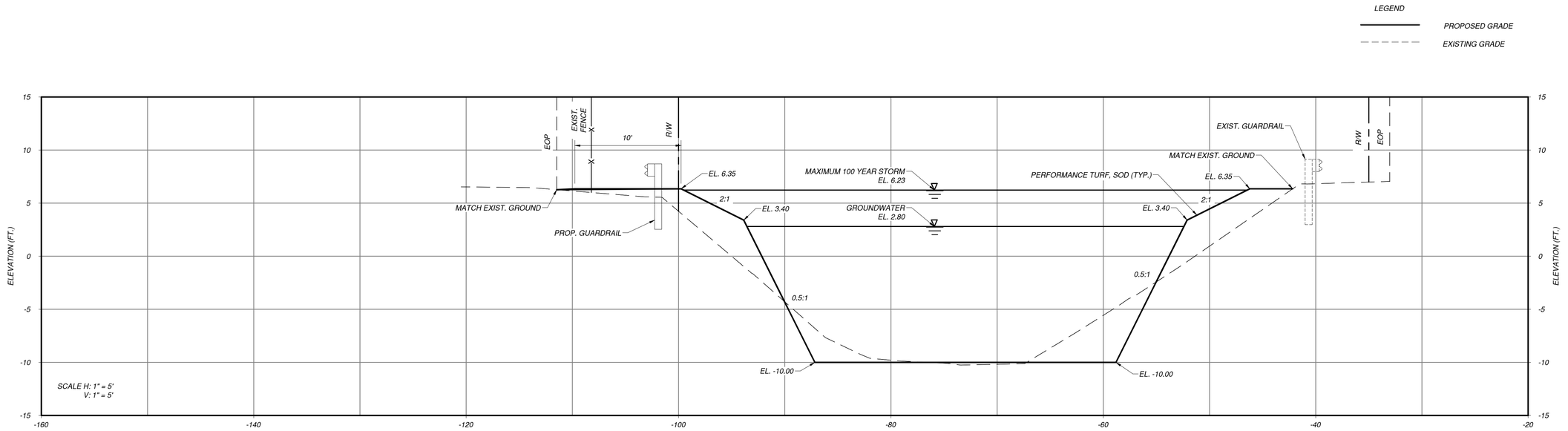
Approximate SPT Boring Location

Approximate Cross-section Station Location

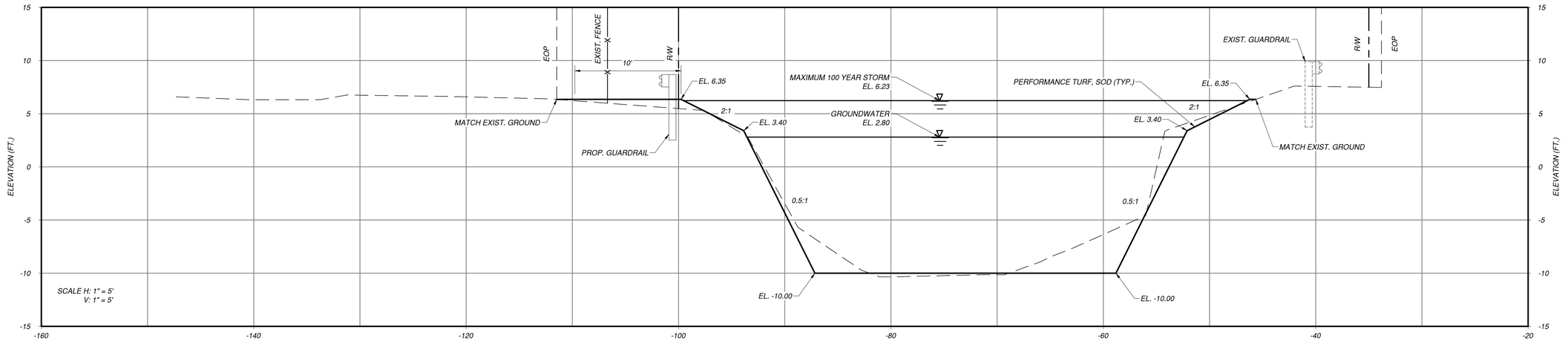
FIGURE No.:	2
DRAWN BY:	AVL
CHECKED BY:	JNG

GEOTECHNICAL ENGINEERING SERVICES
NW 58th Street Outfall Project
City of Doral
Miami-Dade County, Florida
PSI PROJECT No.: 0397-1544
DATE: 07/30/2020

intertek psi



NW 58th ST STA 54+37.38



NW 58th ST STA 56+58.69

DORAL
FLORIDA

CITY OF DORAL
PUBLIC WORKS DEPARTMENT
8401 NW 53rd TERRACE
DORAL, FL 33166

CONSULTANT:
EAC Consulting, Inc.
eacconsult.com
5959 BLUE LAGOON DRIVE, SUITE 410
MIAMI, FL 33126
CA # 7011
EAC PROJECT No.: 17077.WW01-06

Always call 811 two full business days before you dig to have underground utilities located and marked.

Sunshine811.com

PROJECT:
SUB-BASIN H-8
STORMWATER IMPROVEMENTS
(PHASE 2)
CITY PROJECT RFQ 2017-21

SHEET TITLE:
EXISTING CANAL CROSS SECTIONS

REVISIONS

NO.	DESCRIPTION	DATE	BY

DESIGNED BY: HDT
DRAWN BY: KG
REVIEWED BY: ML

SEAL

HERMAN D. TIRADO, P.E.
FL LICENSE NO. : 36910

FILE NAME: C-0.0.dwg
DATE: SEPT 2020
SHEET NO.
C-0.1

30% PLANS

DRAWING SCALE SHOWN CORRESPONDS TO PLOT SIZE OF 24"X36". IF THIS DRAWING IS PLOTTED ON OTHER SIZE SHEET, ENGINEER OF RECORD DOES NOT WARRANT ACCURACY OF DRAWING SCALE.

KRISTOFF GRAHAM

September 9, 2020 9:27 AM

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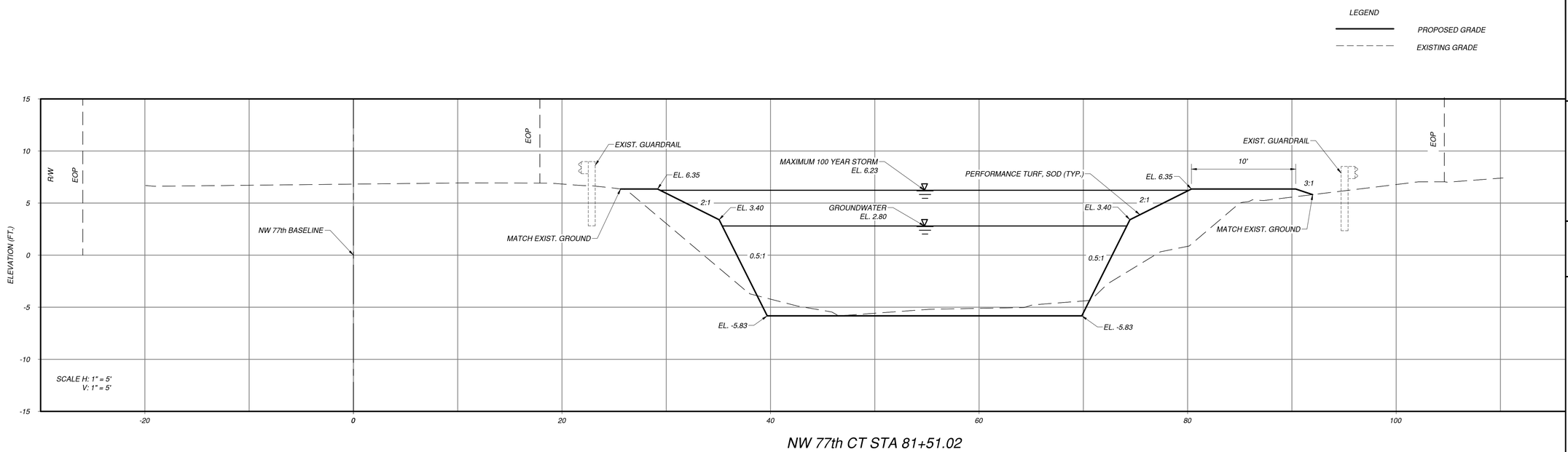
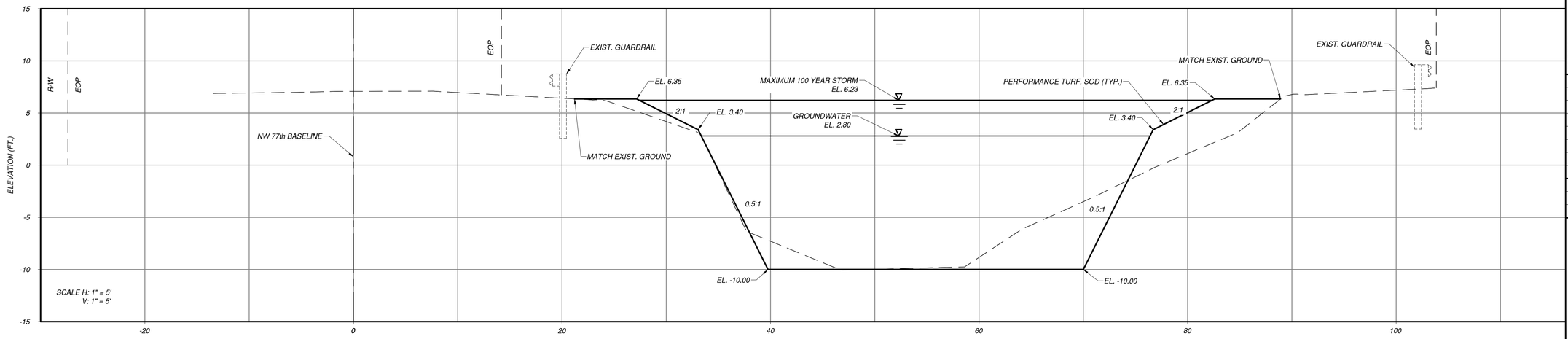


NW 77th CT STA 81+51.02



NW 77th CT STA 82+87.77

DORAL
FLORIDA
CITY OF DORAL
PUBLIC WORKS DEPARTMENT
8401 NW 53rd TERRACE
DORAL, FL 33166

CONSULTANT:
EAC Consulting, Inc.
eacconsult.com
5959 BLUE LAGOON DRIVE, SUITE 410
MIAMI, FL 33126
CA # 7011
EAC PROJECT No.: 17077.WW01-06

Always call 811 two full business days before you dig to have underground utilities located and marked.
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PROJECT:
SUB-BASIN H-8
STORMWATER IMPROVEMENTS
(PHASE 2)
CITY PROJECT RFQ 2017-21

SHEET TITLE:
EXISTING CANAL CROSS SECTIONS

REVISIONS

NO.	DESCRIPTION	DATE	BY

DESIGNED BY: HDT
DRAWN BY: KG
REVIEWED BY: ML

SEAL

HERMAN D. TIRADO, P.E.
FL LICENSE NO. : 36910

FILE NAME: C-0.0.dwg
DATE: SEPT 2020
SHEET NO.
C-0.1

30% PLANS

DRAWING SCALE SHOWN CORRESPONDS TO PLOT SIZE OF 24"X36". IF THIS DRAWING IS PLOTTED ON OTHER SIZE SHEET, ENGINEER OF RECORD DOES NOT WARRANT ACCURACY OF DRAWING SCALE

KRISTOFF GRAHAM
September 9, 2020 9:27 AM
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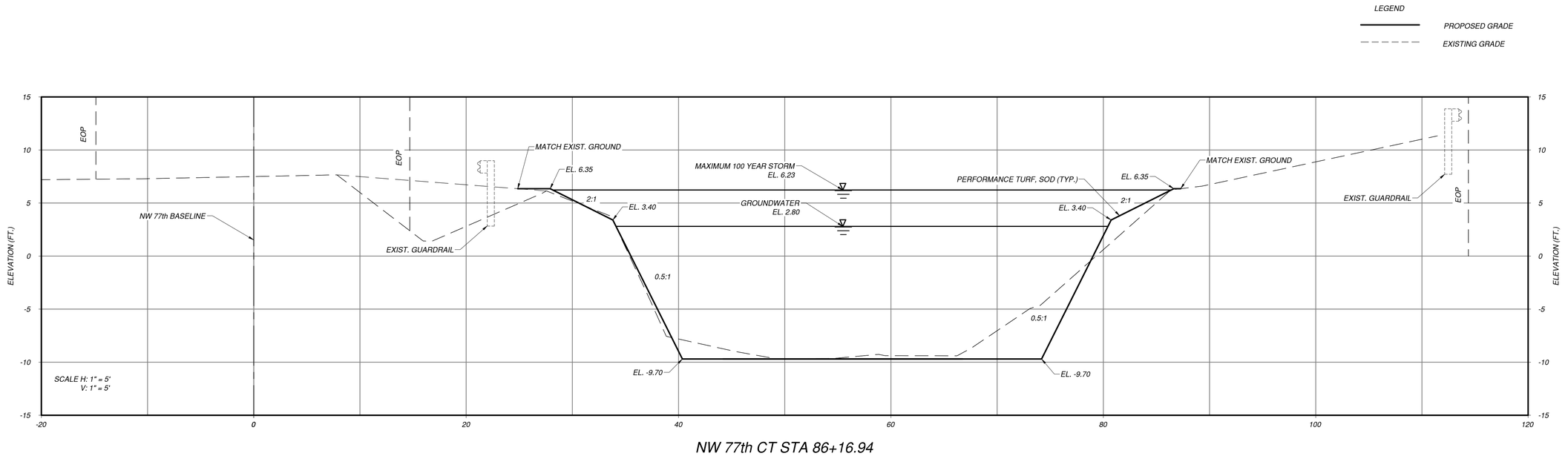
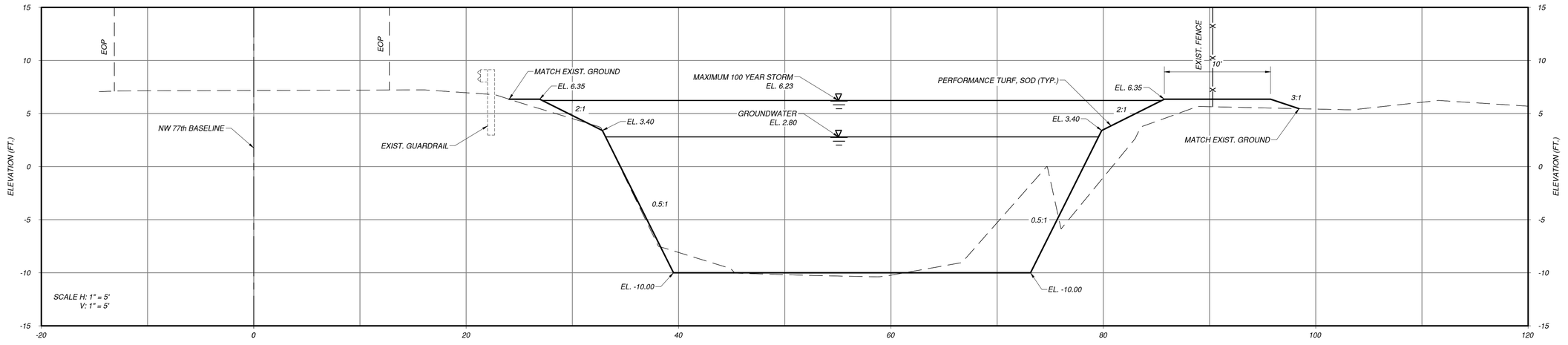


NW 77th CT STA 86+16.94



NW 77th CT STA 89+54.51

DORAL
FLORIDA

CITY OF DORAL
PUBLIC WORKS DEPARTMENT
8401 NW 53rd TERRACE
DORAL, FL 33166

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PROJECT:
SUB-BASIN H-8
STORMWATER IMPROVEMENTS
(PHASE 2)
CITY PROJECT RFQ 2017-21

SHEET TITLE:
EXISTING CANAL CROSS SECTIONS

REVISIONS

NO.	DESCRIPTION	DATE	BY

DESIGNED BY: HDT
DRAWN BY: KG
REVIEWED BY: ML

SEAL

HERMAN D. TIRADO, P.E.
FL LICENSE NO. : 36910

FILE NAME: C-0.0.dwg
DATE: SEPT 2020
SHEET NO.
C-0.1

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KRISTOFF GRAHAM
September 9, 2020 9:27 AM
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APPENDIX B

DATE STARTED:	7/24/20	**DRILL COMPANY:**	INTERTEK - PSI
DATE COMPLETED:	7/24/20	**DRILLER:** LR	**LOGGED BY:** AVL
COMPLETION DEPTH	40.0 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	SPT / Rotary Drilling
ELEVATION:	N/A	**SAMPLING METHOD:**	SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	JNG

REMARKS:

BORING P-01

Water		
	While Drilling	3.8 feet
	Upon Completion	3.8 feet
	Delay	N/A

BORING LOCATION:
See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	Additional Remarks
	0					TOPSOIL (6" Thick)				
				1		Brown Medium Dense Moist to Saturated LIMEROCK with Fine to Medium Grained Sand	GP-GM	3-6-8-11 N=14		
				2				12-12-10-7 N=22		
	5			3		Brown Very Loose Saturated Fine to Medium Grained SAND (Pamlico Formation)	SP	3-2-1-1 N=3		
				4				1-1-3-7 N=4		
				5		Light Brown Medium Dense Saturated Weathered Oolitic LIMESTONE (Miami Formation)		5-9-9-8 N=18		
	10									
				7		Light Brown Loose to Medium Dense Saturated Fine to Medium Grained SAND, Limestone and Cemented Sand Fragments (Fort Thompson Formation)		6-5-5 N=10		
	15									
				8				4-5-7 N=12		
	20						SP			
				9				7-8-8 N=16		
	25									
				10				8-7-7 N=14		
	30									
				11		Light Gray Loose to Medium Dense Saturated Weathered LIMESTONE and Cemented Sand (Fort Thompson Formation)		3-2-3 N=5		
	35									
				12				14-13-13 N=26		
	40					END OF BORING				

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
Moisture ✕ PL ◪ LL ✚
0 25 50
STRENGTH, tsf
Qu ▲ Qp ✳
0 2.0 4.0

Professional Service Industries, Inc.
7950 N.W. 64th Street
Miami, FL 33166
Telephone: (305) 471-7725

PROJECT NO.: 0397-1544
PROJECT: Re-Establishing Historical Top-of-Bank Elev
LOCATION: NW 58th Street, City of Doral, Miami-Dade County, Florida

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING P-02

DATE STARTED:	7/24/20	**DRILL COMPANY:**	INTERTEK - PSI
DATE COMPLETED:	7/24/20	**DRILLER:** LR	**LOGGED BY:** AVL
COMPLETION DEPTH	40.0 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	SPT / Rotary Drilling
ELEVATION:	N/A	**SAMPLING METHOD:**	SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	JNG

REMARKS:

Water

While Drilling	4.3	feet
Upon Completion	4.3	feet
Delay	N/A	

BORING LOCATION:
See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0			1		TOPSOIL (6" Thick)					
						Brown Loose to Medium Dense Moist LIMEROCK with Fine to Medium Grained Sand	GP-GM	2-4-6-8 N=10			
				2				9-10-8-8 N=18			
	5			3		Brown Loose Moist to Saturated Fine to Medium Grained SAND (Pamlico Formation)	SP	5-4-3-3 N=7			
				4				4-3-5-5 N=8			
	10			5		Light Brown Medium Dense Saturated Fine to Medium Grained SAND, Limestone and Cemented Sand Fragments (Fort Thompson Formation)	SP	7-7-6-6 N=13			
	15			7		Light Brown Loose to Medium Dense Saturated Fine to Medium Grained SAND (Fort Thompson Formation)	SP	8-7-6 N=13			
	20			8				6-4-5 N=9			
	25			9				5-6-6 N=12			
	30			10				6-9-8 N=17			
	35			11		Light Gray Medium Dense Saturated Weathered LIMESTONE and Cemented Sand (Fort Thompson Formation)		6-6-5 N=11			
	40			12				16-16-11 N=27			
						END OF BORING					

Professional Service Industries, Inc.
7950 N.W. 64th Street
Miami, FL 33166
Telephone: (305) 471-7725

PROJECT NO.: 0397-1544
PROJECT: Re-Establishing Historical Top-of-Bank Elev
LOCATION: NW 58th Street, City of Doral, Miami-Dade County, Florida

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING P-03

DATE STARTED:	7/23/20	**DRILL COMPANY:**	INTERTEK - PSI
DATE COMPLETED:	7/23/20	**DRILLER:** LR	**LOGGED BY:** AVL
COMPLETION DEPTH	40.0 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	SPT / Rotary Drilling
ELEVATION:	N/A	**SAMPLING METHOD:**	SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	JNG

REMARKS:

Water

While Drilling	4.4	feet
Upon Completion	4.4	feet
Delay	N/A	

BORING LOCATION:
See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ / Moisture / PL / LL (0, 25, 50) / STRENGTH, tsf Qu / Qp (0, 2.0, 4.0)	Additional Remarks
	0			1		TOPSOIL (6" Thick)					
						Brown Loose Moist LIMEROCK with Fine to Medium Grained Sand	GP-GM	3-3-2-2 N=5			
				2		Light Brown Medium Dense Moist to Saturated Weathered Oolitic LIMESTONE (Miami Formation)		10-10-7-7 N=17			
	5			3				10-8-8-8 N=16			
				4				7-12-14-10 N=26			
				5				10-11-10-7 N=21			
	10										
				7		Light Brown Loose to Dense Saturated Fine to Medium Grained SAND (Fort Thompson Formation)		2-2-4 N=6			
	15										
				8				5-5-5 N=10			
	20										
				9			SP	7-11-12 N=23			
	25										
				10				14-16-16 N=32			
	30										
				11				7-7-7 N=14			
	35										
				12		Light Gray Medium Dense Saturated Weathered LIMESTONE and Cemented Sand (Fort Thompson Formation)		12-14-14 N=28			
	40					END OF BORING					

Professional Service Industries, Inc.
7950 N.W. 64th Street
Miami, FL 33166
Telephone: (305) 471-7725

PROJECT NO.: 0397-1544
PROJECT: Re-Establishing Historical Top-of-Bank Elev
LOCATION: NW 58th Street, City of Doral, Miami-Dade County, Florida

The stratification lines represent approximate boundaries. The transition may be gradual.

BORING P-04

DATE STARTED:	7/25/20	**DRILL COMPANY:**	INTERTEK - PSI
DATE COMPLETED:	7/25/20	**DRILLER:** LR	**LOGGED BY:** AVL
COMPLETION DEPTH	40.0 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	SPT / Rotary Drilling
ELEVATION:	N/A	**SAMPLING METHOD:**	SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	JNG

REMARKS:

Water		
	While Drilling	4.1 feet
	Upon Completion	4.1 feet
	Delay	N/A

BORING LOCATION:
See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft / STRENGTH, tsf	Additional Remarks
	0			1		TOPSOIL (6" Thick)					
						Brown Medium Dense Moist LIMEROCK with Fine to Medium Grained Sand	GP-GM	5-6-5-5 N=11			
				2		Light Brown Medium Dense Moist to Saturated Weathered Oolitic LIMESTONE (Miami Formation)		5-5-7-7 N=12			
	5			3				6-9-6-5 N=15			
				4				7-8-8-9 N=16			
				5				9-10-10-7 N=20			
	10										
				7		Light Brown Loose to Medium Dense Saturated Fine to Medium Grained SAND (Fort Thompson Formation)		5-6-4 N=10			
	15										
				8				6-6-5 N=11			
	20										
				9			SP	7-7-7 N=14			
	25										
				10				9-9-10 N=19			
	30										
				11				6-9-8 N=17			
	35										
				12		Light Gray Medium Dense Saturated Weathered LIMESTONE and Cemented Sand (Fort Thompson Formation)		13-15-15 N=30			
	40					END OF BORING					

STANDARD PENETRATION TEST DATA
N in blows/ft ◎
× Moisture ◪ PL ✚ LL
0 25 50
STRENGTH, tsf
▲ Qu ✳ Qp
0 2.0 4.0

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BORING P-05

DATE STARTED:	7/25/20	**DRILL COMPANY:**	INTERTEK - PSI
DATE COMPLETED:	7/25/20	**DRILLER:** LR	**LOGGED BY:** AVL
COMPLETION DEPTH	50.0 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	SPT / Rotary Drilling
ELEVATION:	N/A	**SAMPLING METHOD:**	SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	JNG

REMARKS:

Water

While Drilling	4.0	feet
Upon Completion	4.0	feet
Delay	N/A	

BORING LOCATION:
See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft; Moisture; PL; LL; STRENGTH, tsf; Qu; Qp	Additional Remarks
	0			1		TOPSOIL (6" Thick)					
						Brown Loose Moist LIMEROCK with Fine to Medium Grained Sand	GP-GM	6-4-5-5 N=9			
				2		Light Brown Medium Dense Moist to Saturated Weathered Oolitic LIMESTONE (Miami Formation)		5-9-7-4 N=16			
	5			3				6-5-8-8 N=13			
				4				7-7-9-10 N=16			
				5				10-9-9-8 N=18			
	10										
				7		Light Brown Loose to Medium Dense Saturated Fine to Medium Grained SAND (Fort Thompson Formation)		6-5-4 N=9			
	15										
				8				4-3-4 N=7			
	20										
				9			SP	4-6-5 N=11			
	25										
				10				8-8-9 N=17			
	30										
				11				11-11-12 N=23			
	35										
				12		Light Gray Dense Saturated Weathered LIMESTONE and Cemented Sand (Fort Thompson Formation)		16-18-17 N=35			
	40										
				13				21-19-20 N=39			
	45										
				14				24-21-18 N=39			
	50					END OF BORING					

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BORING P-07

DATE STARTED:	7/23/20	**DRILL COMPANY:**	INTERTEK - PSI
DATE COMPLETED:	7/23/20	**DRILLER:** LR	**LOGGED BY:** AVL
COMPLETION DEPTH	40.0 ft	**DRILL RIG:**	CME-55
BENCHMARK:	N/A	**DRILLING METHOD:**	SPT / Rotary Drilling
ELEVATION:	N/A	**SAMPLING METHOD:**	SS
LATITUDE:		**HAMMER TYPE:**	Automatic
LONGITUDE:		**EFFICIENCY**	N/A
STATION: N/A	**OFFSET:** N/A	**REVIEWED BY:**	JNG

REMARKS:

Water

While Drilling	4.5	feet
Upon Completion	4.5	feet
Delay	N/A	

BORING LOCATION:
See Figure No. 2

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS)	Moisture, %	STANDARD PENETRATION TEST DATA N in blows/ft ◎ × Moisture ◪ PL ✚ LL (0, 25, 50) STRENGTH, tsf ▲ Qu ✳ Qp (0, 2.0, 4.0)	Additional Remarks
	0			1		TOPSOIL (6" Thick)					
						Brown Loose Moist LIMEROCK with Fine to Medium Grained Sand	GP-GM	4-5-4-4 N=9			
				2				7-7-5-6 N=12			
	5			3		Light Brown Medium Dense Moist to Saturated Weathered Oolitic LIMESTONE (Miami Formation)		8-6-5-6 N=11			
				4				9-9-10-12 N=19			
	10			5				12-12-7-6 N=19			
						Light Brown Loose to Medium Dense Saturated Fine to Medium Grained SAND (Fort Thompson Formation)					
	15			7				3-3-3 N=6			
	20			8				3-4-3 N=7			
	25			9			SP	5-9-9 N=18			
	30			10				10-12-13 N=25			
	35			11				9-10-10 N=20			
	40			12		Light Gray Medium Dense Saturated Weathered LIMESTONE and Cemented Sand (Fort Thompson Formation)		13-13-14 N=27			
						END OF BORING					

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LOCATION: NW 58th Street, City of Doral, Miami-Dade County, Florida

The stratification lines represent approximate boundaries. The transition may be gradual.

TABLE 1: SUMMARY OF BORING LOCATIONS
NW 58th Street Outfall Project
City of Doral
Miami-Dade County, Florida
PSI PROJECT No. 0397-1544

BORING	LATITUDE	LONGITUDE	GROUND SURFACE ELEV. (ft)	BORING DEPTH (ft)	GROUNDWATER DEPTH (ft)	DATE PERFORMED
P-01	25.826515°	-80.327447°	N.A.	40	3.8	7/24/2020
P-02	25.826313°	-80.326552°	N.A.	40	4.3	7/24/2020
P-03	25.826355°	-80.325426°	N.A.	40	4.4	7/23/2020
P-04	25.826587°	-80.324321°	N.A.	40	4.1	7/25/2020
P-05	25.827101°	-80.323165°	N.A.	50	4.0	7/25/2020
P-07	25.826498°	-80.325929°	N.A.	40	4.5	7/23/2020

APPENDIX C

TABLE 2: SUMMARY OF LABORATORY TEST RESULTS
NW 58th Street Outfall Project
City of Doral
Miami-Dade County, Florida
PSI PROJECT No. 0397-1544

BORING	SAMPLE DEPHT INTERVAL (feet)	% MOISTURE CONTENT	% GRAVEL	% SAND	% FINES	USCS CLASS.
P-01	2' - 4'	8.15	58.73	38.04	3.23	Limerock
	6' - 8'	10.92	6.02	86.31	7.67	SP
P-02	2' - 4'	7.25	53.21	42.07	4.72	Limerock
	8' - 10'	11.27	3.22	90.97	5.81	SP
P-03	6" - 2'	8.63	51.77	40.65	7.58	Limerock
P-05	6" - 2'	7.53	61.71	35.14	3.15	Limerock
P-07	6" - 2'	6.71	58.34	32.71	8.95	Limerock

APPENDIX D

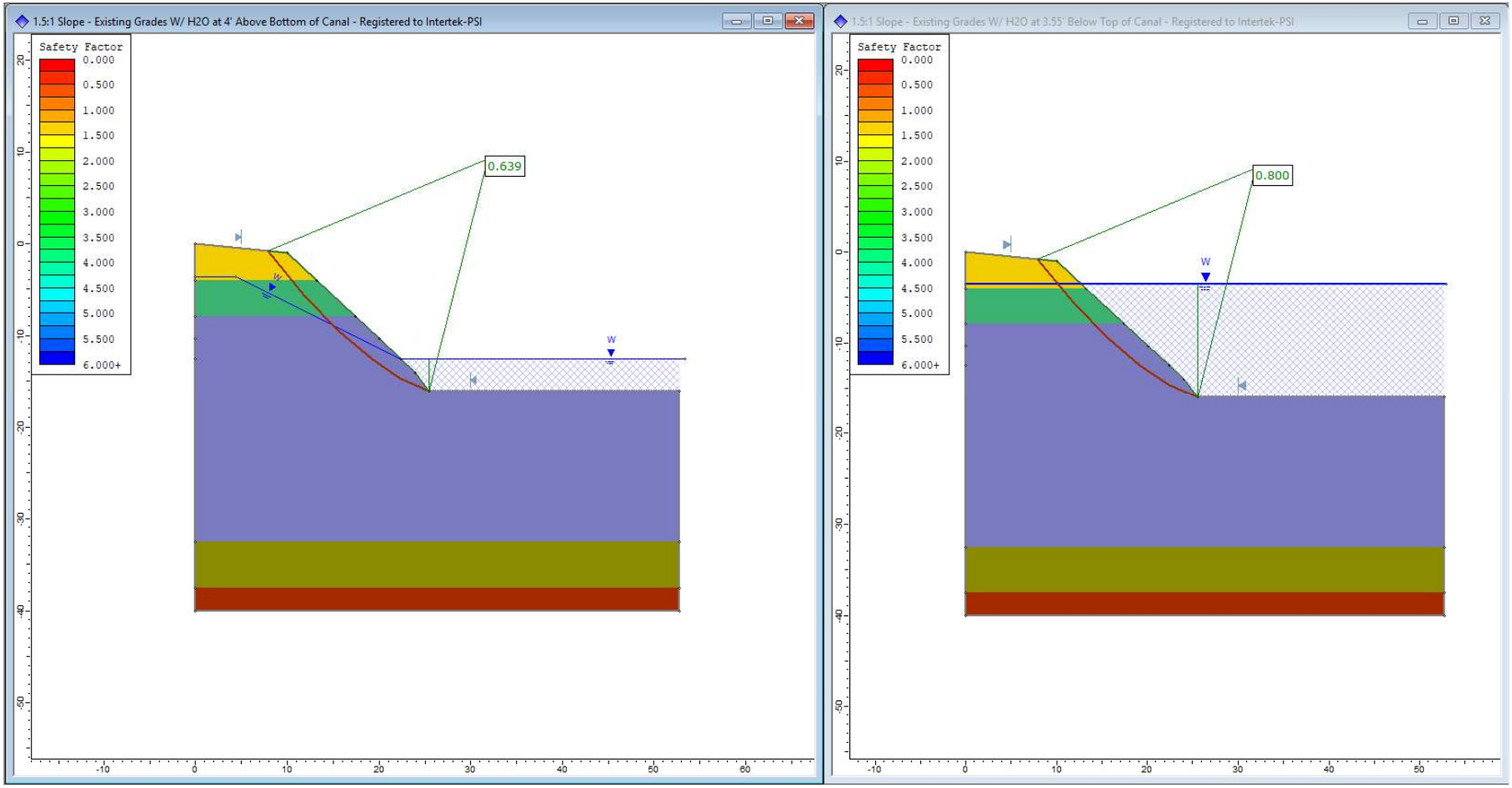

FIGURE No.:	**3**
DRAWN BY:	**LER**
CHECKED BY:	**JNG**

1.5:1 Slope With Sand Only

NW 58th Street Outfall Project, Doral, Miami-Dade County, Florida
PSI PROJECT No.: 0397-1544
DATE: 09/16/2020

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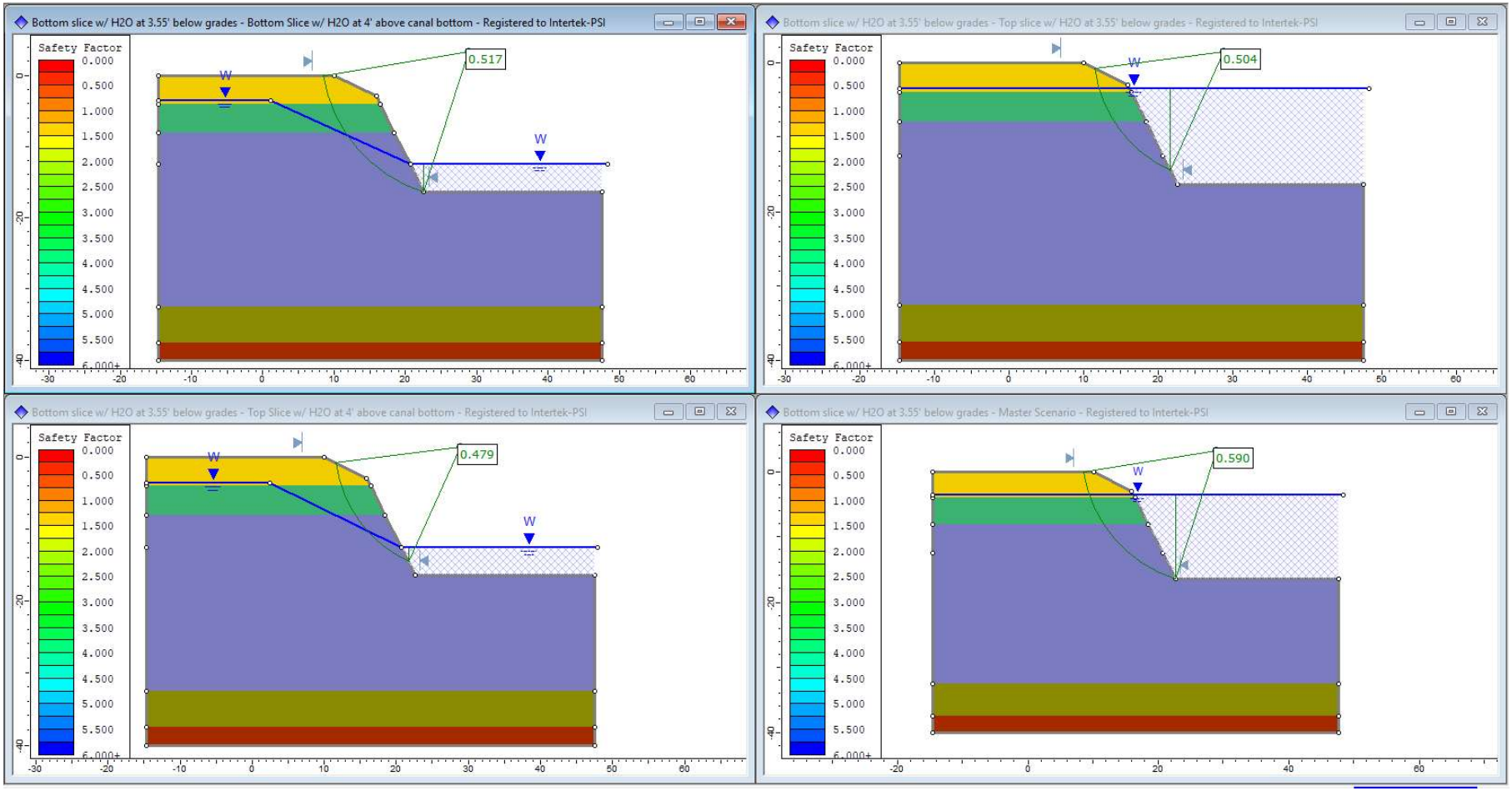

FIGURE No.:	**4**
DRAWN BY:	**LER**
CHECKED BY:	**JNG**

0.5:1 Slope With Sand Only

NW 58th Street Outfall Project, Doral, Miami-Dade County, Florida
PSI PROJECT No.: 0397-1544
DATE: 09/16/2020

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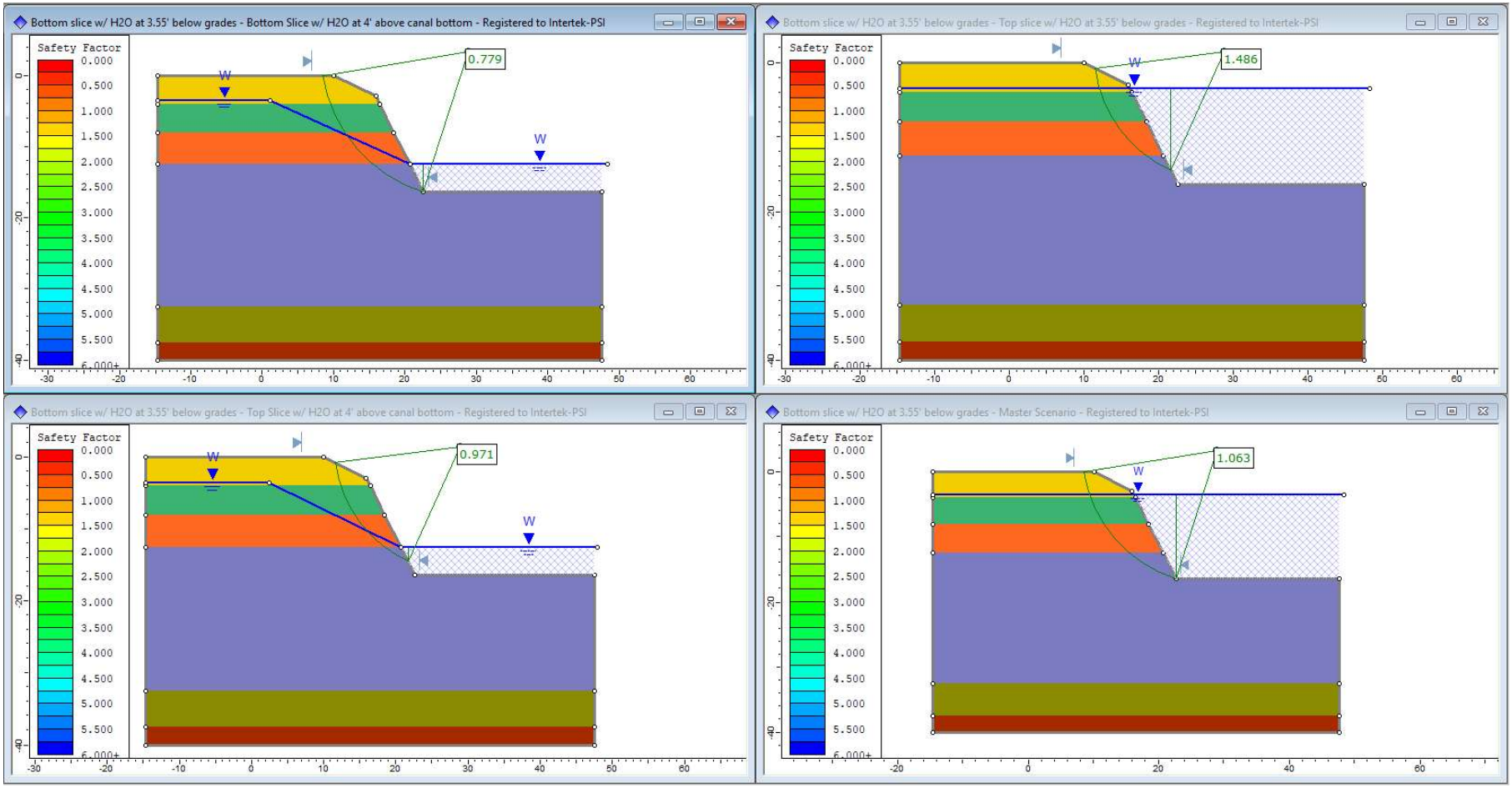

FIGURE No.:	**5**
DRAWN BY:	**LER**
CHECKED BY:	**JNG**

0.5:1 Slope with 4' of Limestone

NW 58th Street Outfall Project, Doral, Miami-Dade County, Florida
PSI PROJECT No.: 0397-1544
DATE: 09/16/2020

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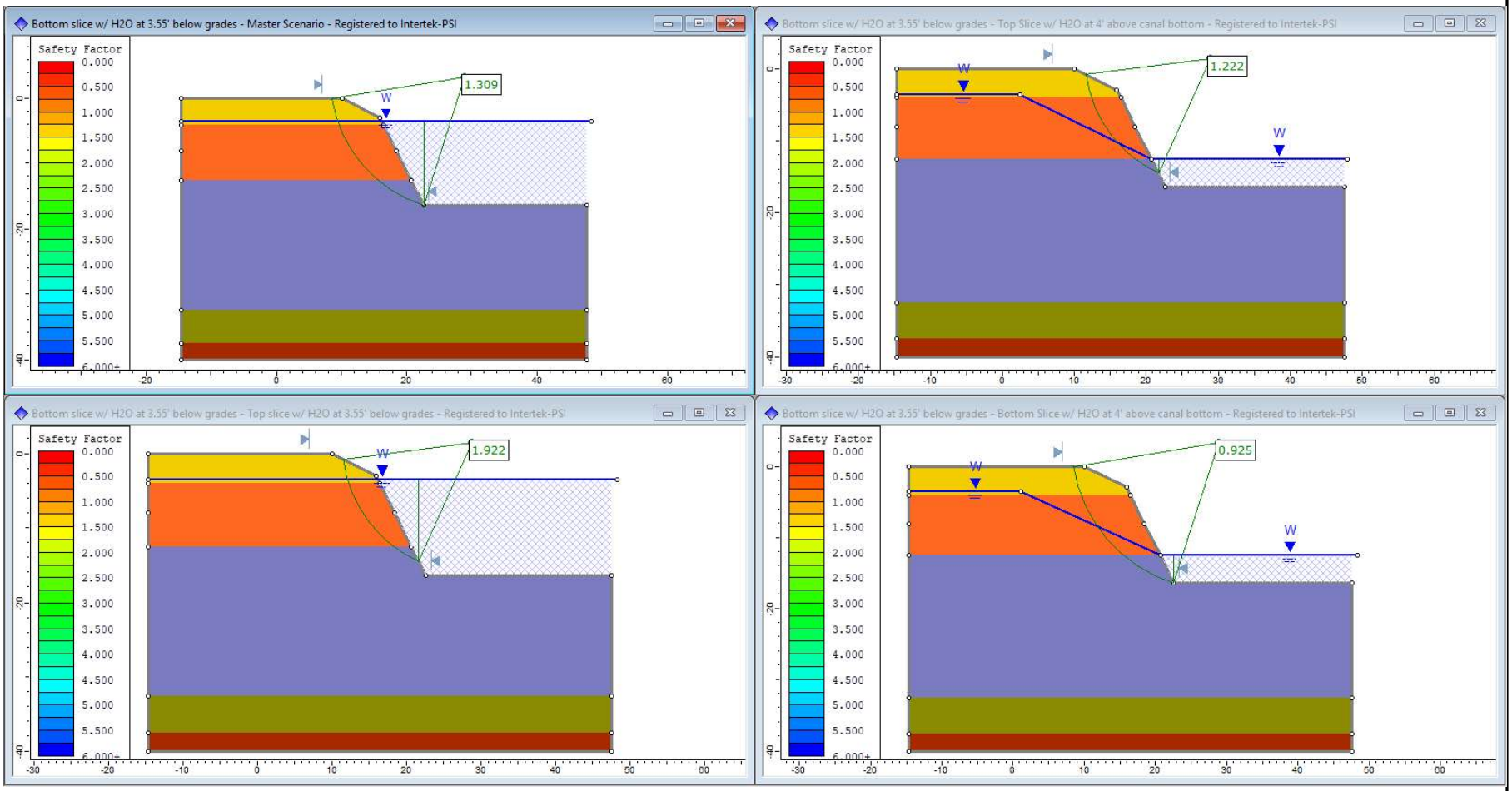

FIGURE No.:	**6**
DRAWN BY:	**LER**
CHECKED BY:	**JNG**

0.5:1 Slope with 10' of Limestone

NW 58th Street Outfall Project, Doral, Miami-Dade County, Florida
PSI PROJECT No.: 0397-1544
DATE: 09/16/2020