SITE CONDITIONS

Our scope of services was developed based on this understanding of the project, so the details below should be verified. Aspects of the project that are undefined or assumed at this point are highlighted as shown here in the following table. We request input from the design team to verify any such information as noted.

Item	Description
Project information	The existing water main along the following roadways is to be replaced: ■ US-41 from 69th Ave. W. to approximately 400 feet south of 69th Ave. W. ■ 69th Ave. W. from US-41 to 11th St. W. ■ 11th St. W. from 69th Ave. W. to 67th Ave. Terr. W. ■ 67th Ave. Terr. W. from 11th St. W. to 8th St. Ct. W. ■ 8th St. Ct. W. from 67th Ave. Terr. W. to 67th Ave. Dr. W. ■ 67th Ave. Dr. W. from 8th St. Ct. W. to 5th St. E. ■ 5th St. E. from 67th Ave. Dr. W. to 63rd Ave. W. Total approximate length = 6,900 linear feet **See Exhibit 1: Site Location** (See **Exhibit 1: Site Location**)
Existing improvements	Asphalt paved roadways with grassed shoulders
Current ground cover	Asphalt pavement, short grasses, and bare earth
Existing topography	The northeast end of the site is at an elevation of about +18 ½ to + 20 feet-NAVD88 and slopes downward to the southwest end of the site at an elevation of about +10 feet-NAVD88. Site grades are to remain relatively unchanged.

EXPLORATION AND TESTING PROCEDURES

Based on our understanding of the project as noted in **Project Understanding**, and as requested by you, we completed the following scope of services for field exploration and laboratory testing for this project.

Field Exploration

Our field exploration work included the drilling and sampling of exploratory soil borings consistent with the following schedule.

Number of Borings	Boring Depth (ft)	Planned Location
22	8	Water Main
2	16	Jack and Bore Locations

Locations of soil borings are provided on **Exhibit 2A through 2G: Anticipated Exploration Plan**. The locations were established in the field by Terracon's exploration team using a measuring wheel/tape and/or a hand-held GPS unit with reference to known points. The two 16-foot deep borings will be located in the vicinity of the planned Jack and Bore. The accuracy of the exploration points is usually within 10 feet of the noted location. The ground surface elevations are estimated from the most recent USGS topographic maps, and the accuracy of the ground surface at each point is probably about 2 feet.

We advanced the soil borings with a truck-mounted drill rig using a cutting head and stabilizing with the use of bentonite (drillers' mud). We obtained representative samples primarily by the split-barrel sampling procedure. In the split-barrel sampling procedure, a standard, 2-inch O.D., split-barrel sampling spoon is driven into the boring with a 140-pound rope and cathead operate SPT (Standard Penetration Test) hammer falling 30 inches. We recorded the number of blows required to advance the sampling spoon the middle 12 inches of a 24-inch sampling interval as the standard penetration resistance value, N.

Our exploration team prepared field boring logs as part of the drilling operations. These field logs include visual classifications of the materials encountered during drilling and driller's interpretation of the subsurface conditions between samples. Ground water observations were also recorded. The final boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in the laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned various laboratory tests to better understand the engineering properties of the various soil and rock strata as necessary for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216-10: Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D422-63(2007)e2: Standard Test Method for Particle-Size Analysis of Soils
- ASTM D2974-04: Standard Test Method for Organic Content
- Standard Test Method for laboratory determination of pH (EPA 9045C), resistivity (ASTM D1125), sulfate content (EPA 9056), and chloride content (EPA 300.0)

The laboratory testing program also included examination of soil samples by an engineer. Based on observation and test data, the engineer classified the soil samples in accordance with the Unified Soil Classification System (ASTM D2487). Additionally, nine (9) samples were transported to Palm Beach Environmental Laboratories, Inc. for corrosion series testing (pH, resistivity, sulfate content, and chloride content).

GEOTECHNICAL MODEL

Subsurface conditions on the project site can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum	Material Description	Consistency/Density
1	4 to 6 inches	Asphalt pavement	Not applicable
	7 to 11 inches	Sand-shell base course	
2 [1]	4 feet	Organic SAND, with silt	Medium dense
3	4 to 16 feet	Fine SAND with trace to slight amounts of silt, trace shell fragments, and occasionally trace to some organic material (SP, SP-SM)	Very loose to dense
4 [2]	16 feet	Weathered LIMESTONE	Very hard

1. Only found in Boring B-10 at a depth of 2 to 4 feet bgs.
2. Only found in Boring B-15 at a depth of 15 ½ to 16 feet bgs.

Conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in situ, the transition between materials may be gradual. Details for each of the borings can be found in **Exploration Results**. A discussion of field sampling and laboratory testing procedures and test results are presented in **Exploration and Testing Procedures**.

The percent by weight of the organic content identified in samples from Strata 2 and 3 soils are presented below. Generally, soils with an organic content greater than 5% are not suitable for pipe backfill or bedding.

Boring No.	Depth of the layer	Organic Content (%)
B-4	4 to 6 feet	4.8
B-7	6 to 8 feet	1.2
B-10	2 to 4 feet	7.8
B-16	4 to 6 feet	3.7
B-18	0 to 2 feet	4.8

Groundwater

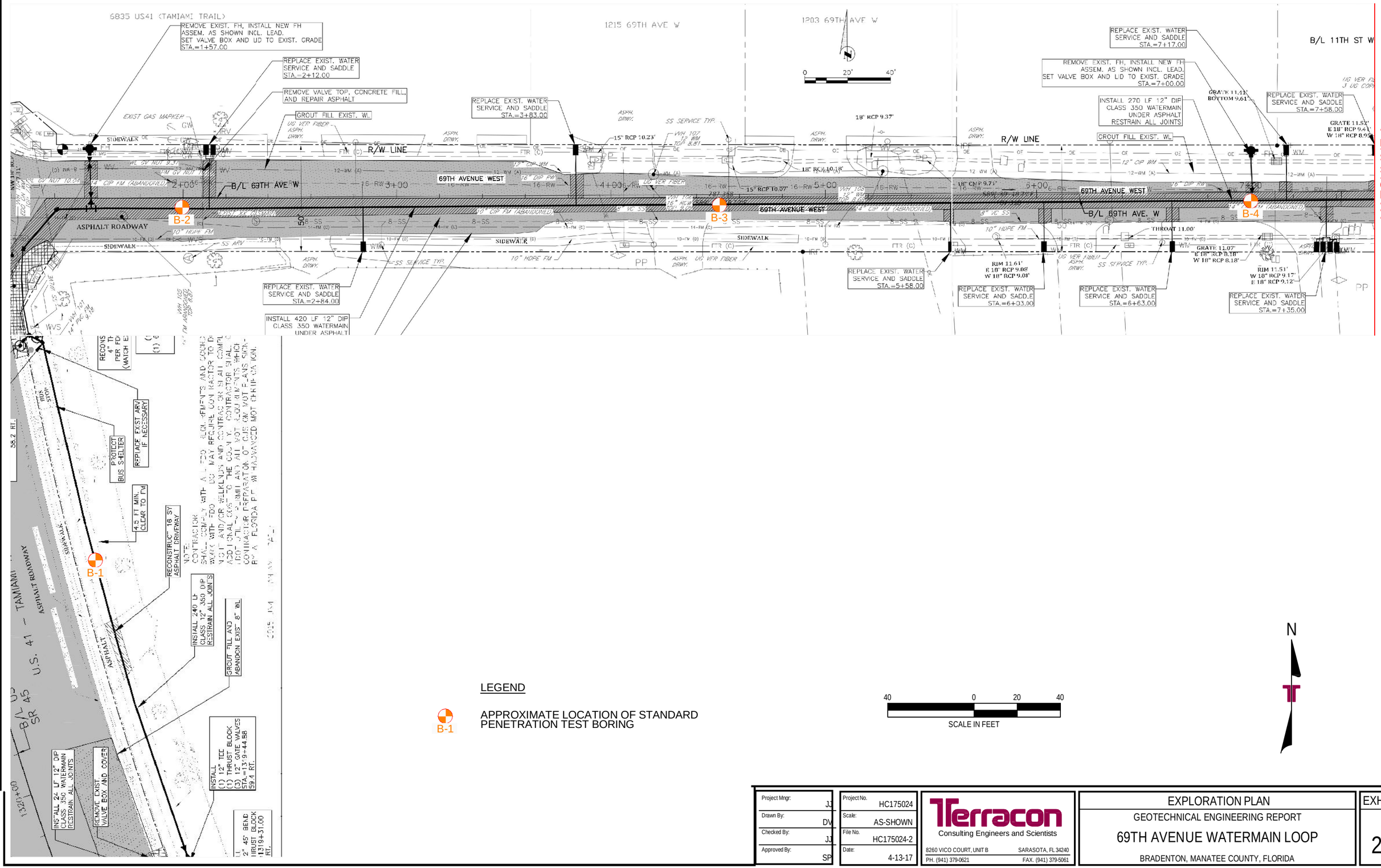
The boreholes were observed while drilling for the presence and level of groundwater. The water levels observed in the boreholes can be found in **Exploration Results**, and are summarized below.

Boring number	Depth to groundwater while drilling, ft.	Boring number	Depth to groundwater while drilling, ft.
B-1	8	B-13	5 ½
B-2	8	B-14	8
B-3	8	B-15	5
B-4	8	B-16	4 ½
B-5	4 ½	B-17	4 ½
B-6	5	B-18	7 ½
B-7	5	B-19	4 ½
B-8	6	B-20	4 ½
B-9	5	B-21	5
B-10	3 ½	B-22	5 ½
B-11	3 ½	B-23	4 ½
B-12	3 ½	B-24	5

The groundwater measurements are influenced by the drilling process and ambient weather conditions which have been very dry.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

If a more detailed seasonal high groundwater level estimate is needed, we recommend the installation of shallow groundwater monitoring wells (i.e. piezometers) for the collection of stabilized groundwater level measurements.



LEGEND

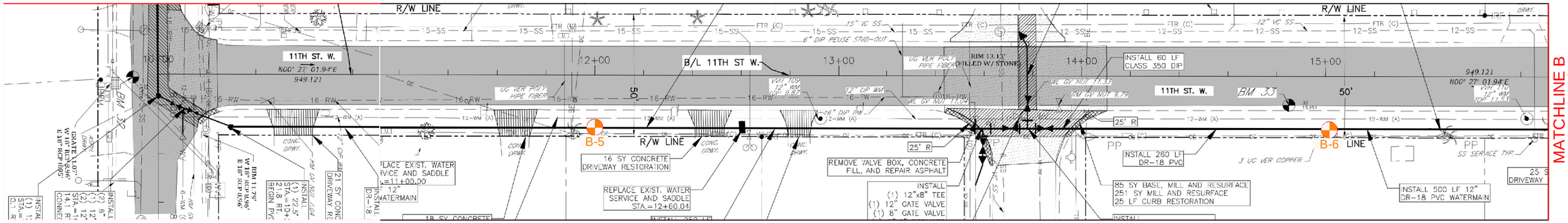
B-1 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

40 0 20 40
SCALE IN FEET

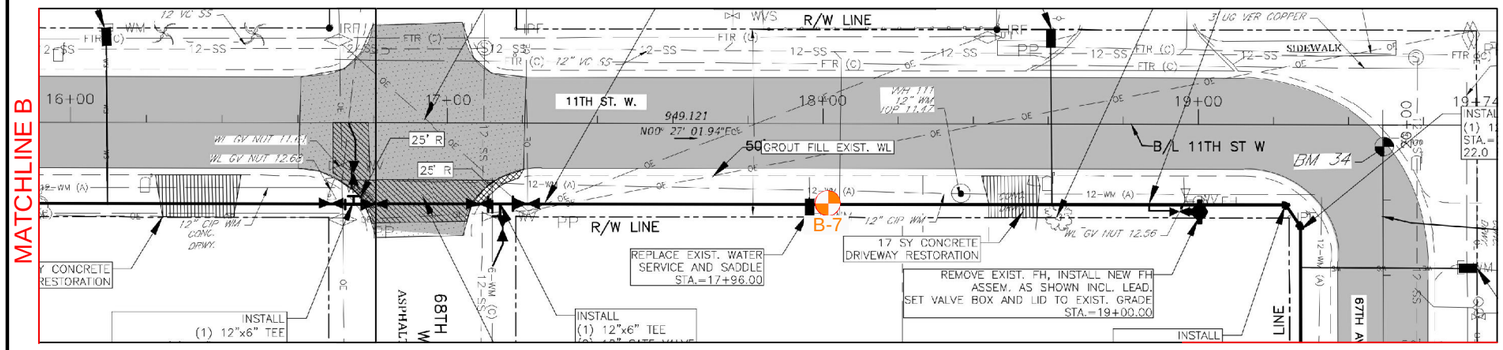
N

Project Mngr: JJ	Project No. HC175024	Terracon Consulting Engineers and Scientists	EXPLORATION PLAN	EXHIBIT
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT	
Checked By: JJ	File No. HC175024-2	PH. (941) 379-0621 FAX. (941) 379-5061	69TH AVENUE WATERMAIN LOOP	2A
Approved By: SP	Date: 4-13-17		BRADENTON, MANATEE COUNTY, FLORIDA	

MATCHLINE A



MATCHLINE B



MATCHLINE C

LEGEND

B-5 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

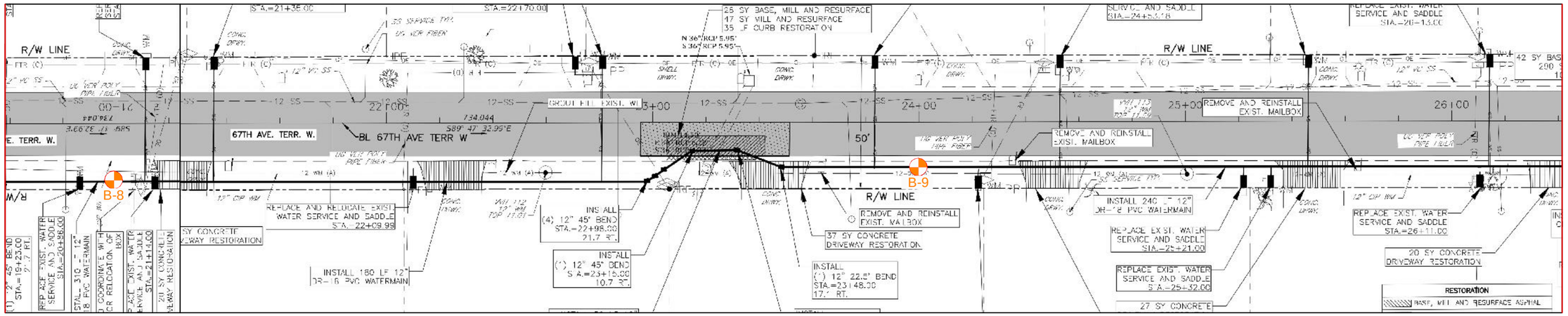
40 0 20 40
SCALE IN FEET

N

Project Mngr: JJ	Project No. HC175024	Terracon Consulting Engineers and Scientists	EXPLORATION PLAN
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT
Checked By: JJ	File No. HC175024-2	PH. (941) 379-0621 FAX. (941) 379-5061	69TH AVENUE WATERMAIN LOOP
Approved By: SP	Date: 4-13-17		BRADENTON, MANATEE COUNTY, FLORIDA

EXHIBIT 2B

MATCHLINE C



MATCHLINE D

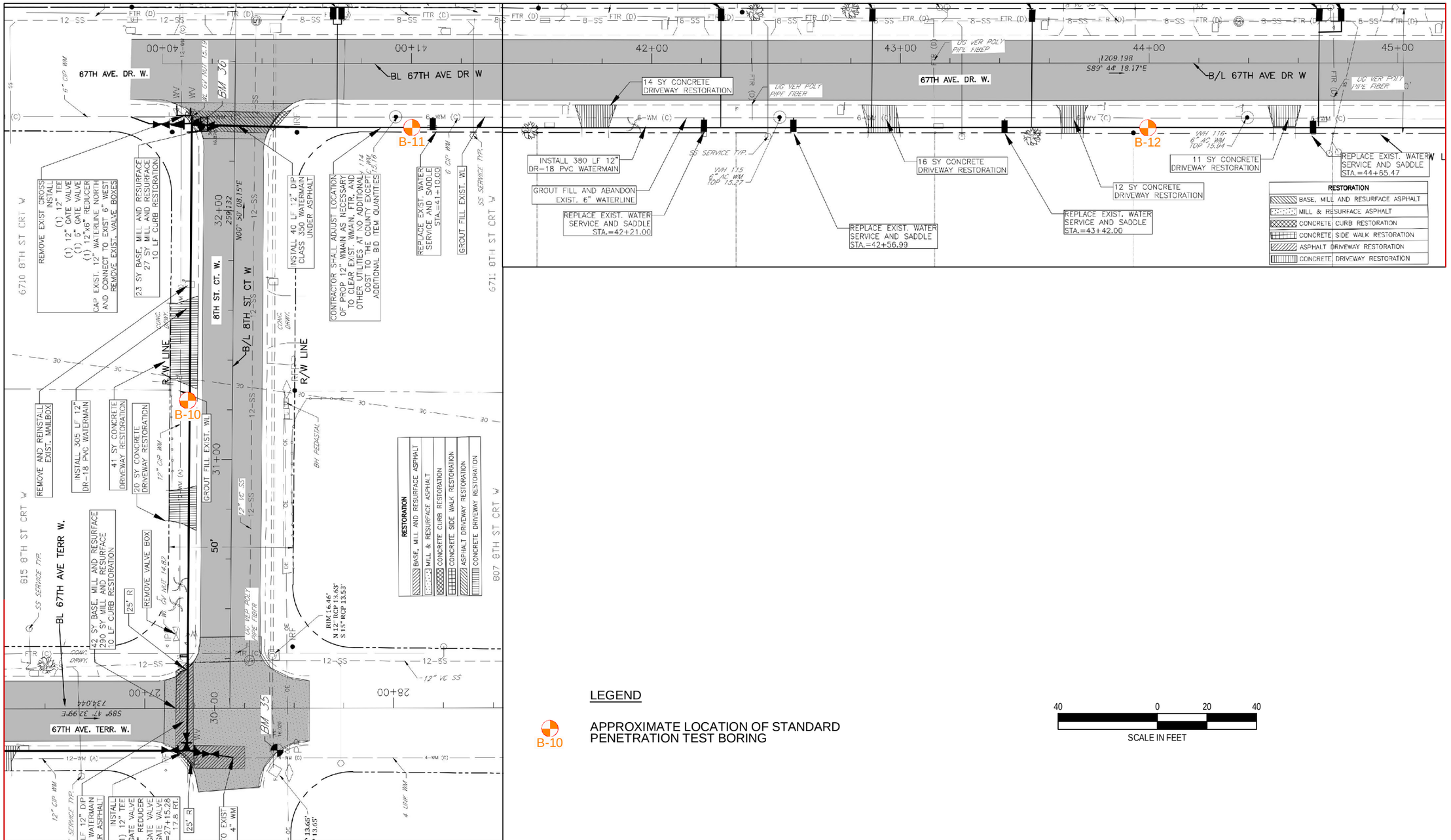
LEGEND

B-8 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

40 0 20 40
SCALE IN FEET

N

Project Mngr: JJ	Project No. HC175024	Terracon Consulting Engineers and Scientists	EXPLORATION PLAN	EXHIBIT
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT	2C
Checked By: JJ	File No. HC175024-2	PH. (941) 379-0621 FAX. (941) 379-5061	69TH AVENUE WATERMAIN LOOP	
Approved By: SP	Date: 4-13-17		BRADENTON, MANATEE COUNTY, FLORIDA	



LEGEND

B-10 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

40 0 20 40

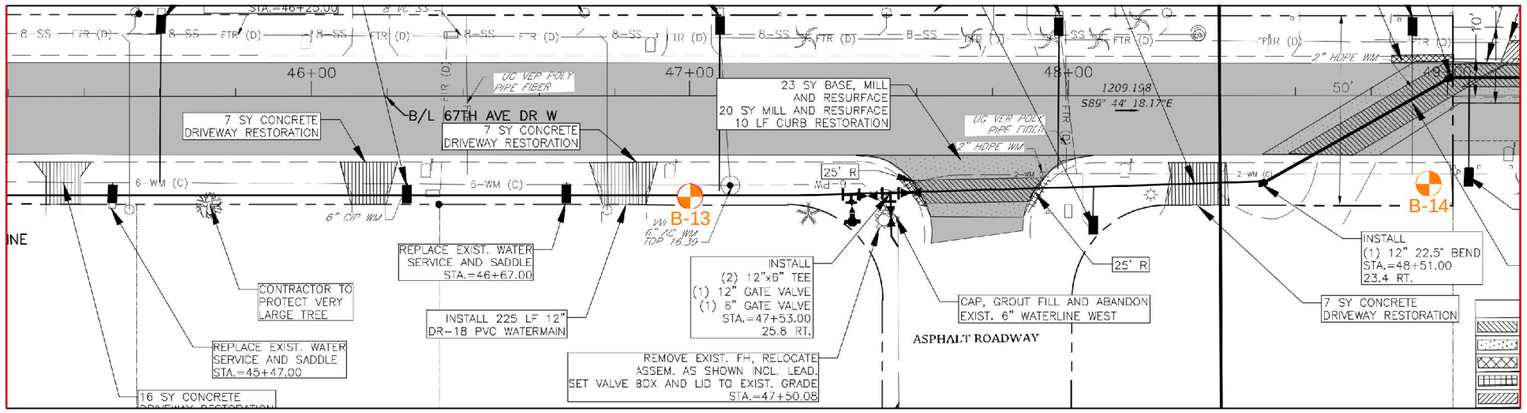
SCALE IN FEET

N

Project Mngr: JJ	Project No. HC175024	Terracon Consulting Engineers and Scientists	EXPLORATION PLAN
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT
Checked By: JJ	File No. HC175024-2	PH. (941) 379-0621 FAX. (941) 379-5061	69TH AVENUE WATERMAIN LOOP
Approved By: SP	Date: 4-13-17		BRADENTON, MANATEE COUNTY, FLORIDA

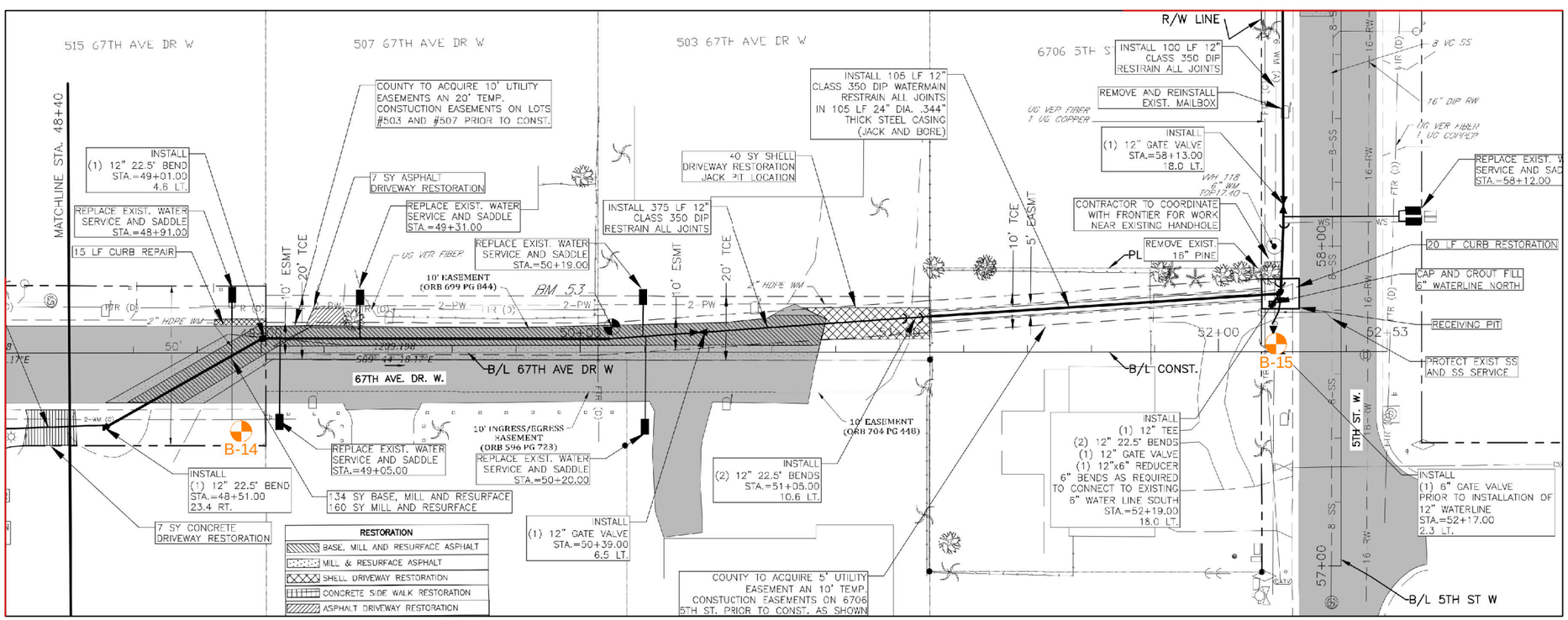
EXHIBIT 2D

MATCHLINE E



MATCHLINE F

MATCHLINE G



N

LEGEND

B-13 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

40 0 20 40
SCALE IN FEET

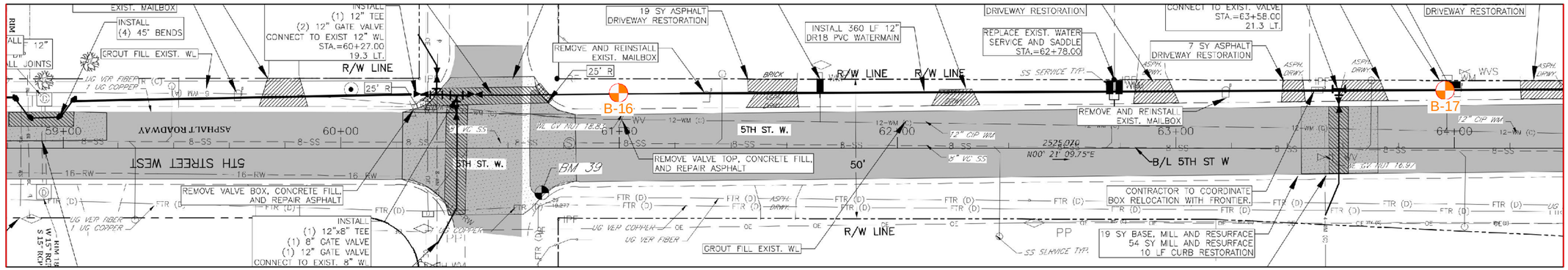
Project Mngr:	JJ
Drawn By:	DV
Checked By:	JJ
Approved By:	SP
Project No.	HC175024
Scale:	AS-SHOWN
File No.	HC175024-2
Date:	4-13-17

Terracon
Consulting Engineers and Scientists
8260 VICO COURT, UNIT B SARASOTA, FL 34240
PH. (941) 379-0621 FAX. (941) 379-5061

EXPLORATION PLAN
GEOTECHNICAL ENGINEERING REPORT
69TH AVENUE WATERMAIN LOOP
BRADENTON, MANATEE COUNTY, FLORIDA

EXHIBIT 2E

MATCHLINE G



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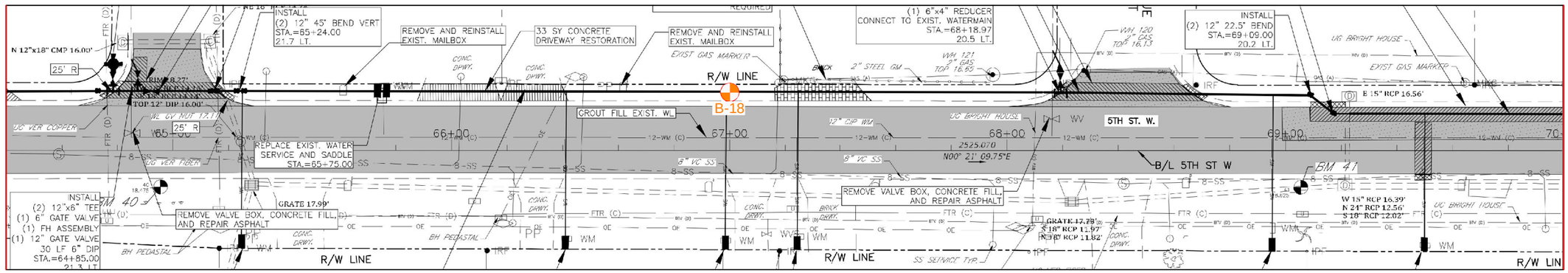
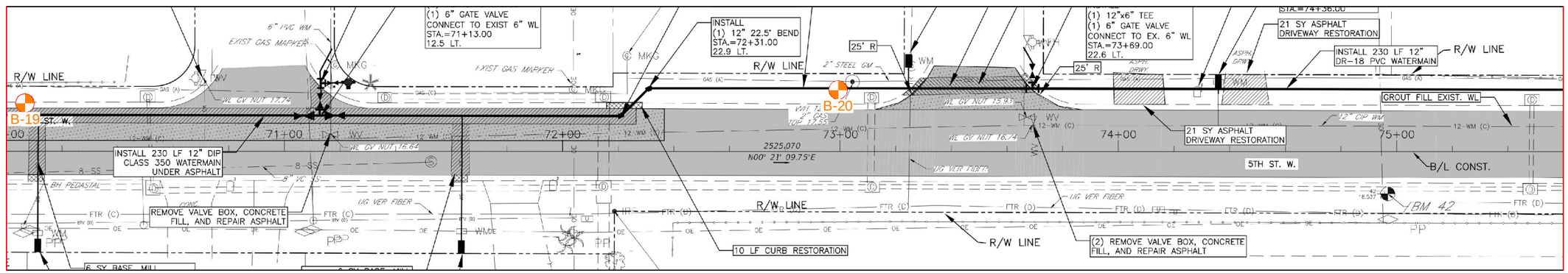


MATCHLINE I



MATCHLINE J

N

LEGEND

B-16 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

40 0 20 40
SCALE IN FEET

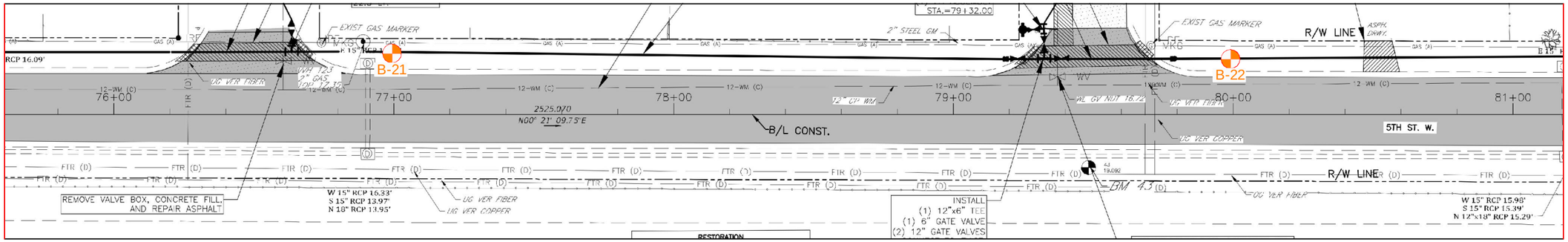
Project Mngr:	JJ
Drawn By:	DV
Checked By:	JJ
Approved By:	SP
Project No.	HC175024
Scale:	AS-SHOWN
File No.	HC175024-2
Date:	4-13-17

Terracon
Consulting Engineers and Scientists
8260 VICO COURT, UNIT B SARASOTA, FL 34240
PH. (941) 379-0621 FAX. (941) 379-5061

EXPLORATION PLAN
GEOTECHNICAL ENGINEERING REPORT
69TH AVENUE WATERMAIN LOOP
BRADENTON, MANATEE COUNTY, FLORIDA

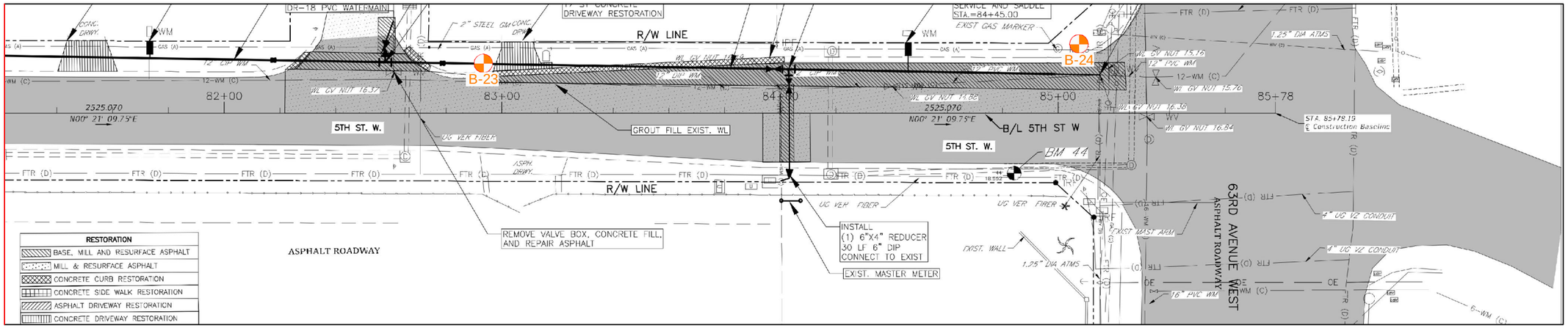
EXHIBIT 2F

MATCHLINE J



MATCHLINE K

MATCHLINE K



LEGEND

B-21 APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

40 0 20 40
SCALE IN FEET

N

Project Mngr: JJ	Project No. HC175024	Terracon Consulting Engineers and Scientists	EXPLORATION PLAN
Drawn By: DV	Scale: AS-SHOWN	8260 VICO COURT, UNIT B SARASOTA, FL 34240	GEOTECHNICAL ENGINEERING REPORT
Checked By: JJ	File No. HC175024-2	PH. (941) 379-0621 FAX. (941) 379-5061	69TH AVENUE WATERMAIN LOOP
Approved By: SP	Date: 4-13-17		BRADENTON, MANATEE COUNTY, FLORIDA

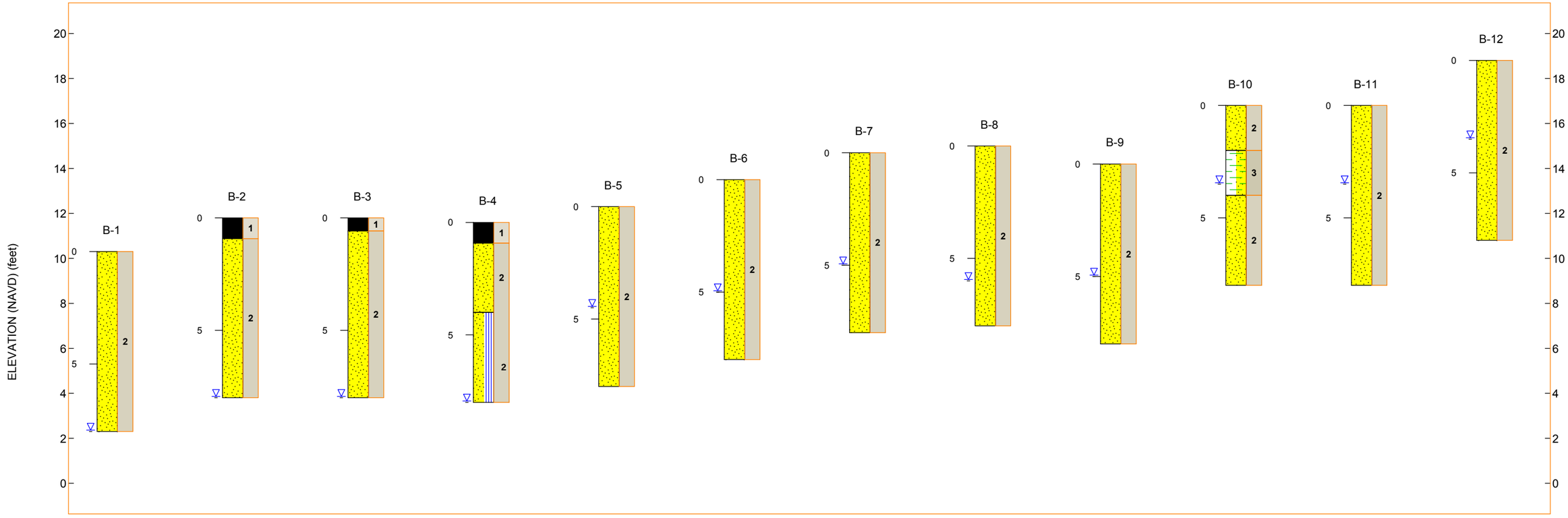
EXHIBIT 2G

GEOTECHNICAL MODEL

69th Avenue Watermain Loop ■ Bradenton, FL

5/18/2017 ■ Terracon Project No. HC175024

Terracon GeoReport



Position Along Baseline - Generally South to North

Poorly-graded Sand

Asphalt

Poorly-graded Sand with Silt

Organic Sand with Silt

Model Layer	Termed	General Description
1	**PAVEMENT**	4 to 6 inches of Asphalt 6 to 11 inches of Aggregate Base
2	**SP, SP-SM**	Fine SAND with trace to slight amounts of silt, trace shell fragments, and occasionally trace to some organic material
3	**ORGANIC SAND**	Organic SAND, with silt
4	**Limestone**	Weathered Limestone

NOTES:

See boring logs for more detailed conditions specific to each boring.

GeoModel provided for illustration purposes only. Actual subsurface conditions between borings will vary.

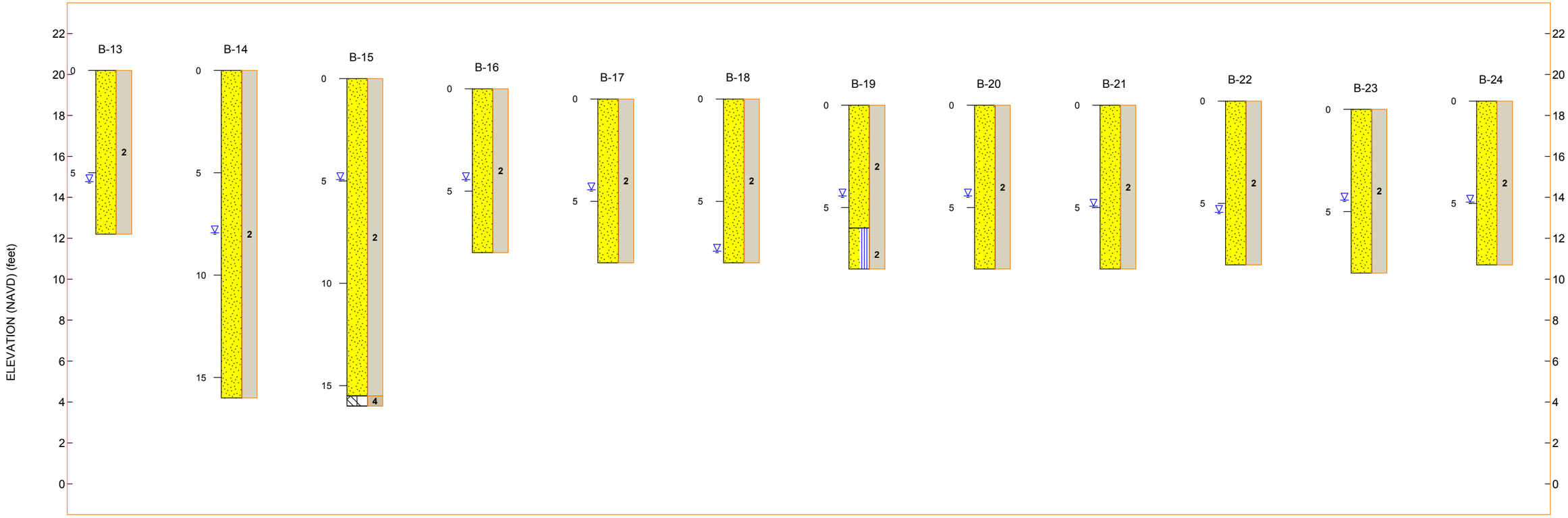
Layering shown on this figure has been developed by the geotechnical engineer for purposes of characterization of subsurface conditions as required for the subsequent geotechnical engineering for this project.

LEGEND

▽ Grounwater observation during drilling

GEOTECHNICAL MODEL
69th Avenue Watermain Loop ■ Bradenton, FL
5/18/2017 ■ Terracon Project No. HC175024

Terracon GeoReport



Position Along Baseline - Generally South to North

Poorly-graded Sand
Weathered Limestone
Poorly-graded Sand with Silt

Model Layer	Termed	General Description
1	**PAVEMENT**	4 to 6 inches of Asphalt 6 to 11 inches of Aggregate Base
2	**SP, SP-SM**	Fine SAND with trace to slight amounts of silt, trace shell fragments, and occasionally trace to some organic material
3	**ORGANIC SAND**	Organic SAND, with silt
4	**Limestone**	Weathered Limestone

NOTES:
See boring logs for more detailed conditions specific to each boring.
GeoModel provided for illustration purposes only. Actual subsurface conditions between borings will vary.

Layering shown on this figure has been developed by the geotechnical engineer for purposes of characterization of subsurface conditions as required for the subsequent geotechnical engineering for this project.

LEGEND
▽ Groundwater observation during drilling

BORING LOG NO. B-1

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.417854° Longitude: -82.575161°

Approximate Surface Elev: 10.3 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2		**POORLY GRADED SAND (SP)**, trace shell, fine grained, brown and gray, medium dense	5	▽		6-5-5-13 N=10			
							5-6-8-9 N=14			
							5-6-7-10 N=13			
							8-8-13-19 N=21			
		8.0	2.5+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-2

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.41834° Longitude: -82.575036°

Approximate Surface Elev: 11.8 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
0.9	11+/-	1							
		2	5			4-6-7-8 N=13			
				▽		5-5-7-9 N=12		18	1
8.0	4+/-								

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-3

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.41835° Longitude: -82.57353°

Approximate Surface Elev: 11.8 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	MODEL LAYER	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
0.6	11+/-	1	**Pavement: 4" Asphalt and 3" Aggregate base**							
		2	**POORLY GRADED SAND (SP)**, fine grained, brown and gray, medium dense						13	3
				5			3-5-14-16 N=19			
							10-12-11-13 N=23			
8.0	4+/-				▽					
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-4

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.418897° Longitude: -82.573176°

Approximate Surface Elev: 11.6 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	1	0.9	10.5+/-							
	2									
		4.0	7.5+/-							
	2			5			7-7-12-13 N=19	4.8	29	7
							6-4-5-10 N=9			
		8.0	3.5+/-		▽					

Pavement: 5" Asphalt and 6" Aggregate base

POORLY GRADED SAND (SP), fine grained, brown and gray

POORLY GRADED SAND WITH SILT (SP-SM), trace organics, fine grained, brown, loose to medium dense

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-5

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.419728° Longitude: -82.573179°

Approximate Surface Elev: 12.3 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2		**POORLY GRADED SAND (SP)**, fine grained, brown and gray, medium dense	5	▽		3-9-6-6 N=15			
							4-5-8-11 N=13			
		8.0	4.5+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 4.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-6

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.420555° Longitude: -82.573176°

Approximate Surface Elev: 13.5 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2		**POORLY GRADED SAND (SP)**, fine grained, brown and gray, loose to medium dense	5	▽		2-2-3-4 N=5			
							4-4-6-11 N=10			
							3-6-12-15 N=18			
							12-12-11-16 N=23			
		8.0	5.5+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-7

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.420906° Longitude: -82.572906°

Approximate Surface Elev: 14.7 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	0	14.7							
							2-2-2-3 N=4			
							2-1-2-3 N=3			
				5	▽		2-4-8-10 N=12			
							6-8-9-15 N=17	1.2	23	4
		8.0	6.5+/-							

POORLY GRADED SAND (SP), trace organics, fine grained, brown and gray, loose to medium dense

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-8

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.42093° Longitude: -82.572003°

Approximate Surface Elev: 15.0 (Ft.) +/-

DEPTH ELEVATION (Ft.)

GRAPHIC LOG	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	5	▽		2-3-3-4 N=6			
					2-3-3-3 N=6			
					2-3-7-9 N=10			
					5-6-7-9 N=13			

POORLY GRADED SAND (SP), fine grained, brown and gray, loose to medium dense

8.0 7+/-

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 6' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-9

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.420919° Longitude: -82.571082°

Approximate Surface Elev: 14.2 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
			2				2-4-4-5 N=8			
							2-2-2-2 N=4			
				5	▽		2-2-3-5 N=5			
							4-5-5-7 N=10		18	2
8.0	6+/-									

POORLY GRADED SAND (SP), fine grained, brown and gray, loose

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-10

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.421614° Longitude: -82.570735°

Approximate Surface Elev: 16.8 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	**POORLY GRADED SAND (SP)**, fine grained, brown and gray, loose					3-3-6-6 N=9			
		2.0	15+/-							
	3	**ORGANIC SAND (SP-SM)**, with silt, fine grained, brown and gray, medium dense			▽		5-4-9-12 N=13	7.8		
		4.0	13+/-							
	2	**POORLY GRADED SAND (SP)**, fine grained, brown and gray, medium dense		5			3-5-7-14 N=12			
							7-10-14-20 N=24			
		8.0	9+/-							
		Boring Terminated at 8 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 3.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-11

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.421612° Longitude: -82.569822°

Approximate Surface Elev: 16.8 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2		**POORLY GRADED SAND (SP)**, fine grained, brown and gray, loose to dense	5	▽		3-4-5-6 N=9			
							3-10-19-14 N=29			
							6-5-10-17 N=15			
							11-13-20-27 N=33			
		8.0	9+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 3.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-12

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.421612° Longitude: -82.568897°

Approximate Surface Elev: 18.8 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	0	11+/-	5	▽		2-3-5-7 N=8			
							8-6-6-8 N=12			
							5-8-15-16 N=23			
							8-9-9-12 N=18			
		8.0								

POORLY GRADED SAND (SP), fine grained, brown and gray, loose to medium dense

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 3.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-13

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.421616° Longitude: -82.568297°

Approximate Surface Elev: 20.2 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	0	20.2							
							3-2-2-3 N=4			
							5-6-7-7 N=13			
				5	▽		5-5-6-11 N=11			
							8-7-7-9 N=14			
		8.0	12+/-							

POORLY GRADED SAND (SP), fine grained, brown and gray, loose to medium dense

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-14

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.421709° Longitude: -82.567926°

Approximate Surface Elev: 20.2 (Ft.) +/-

DEPTH ELEVATION (Ft.)

GRAPHIC LOG	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2				2-3-4-6 N=7			
					6-7-6-8 N=13			
		5			7-6-11-13 N=17			
			▽		11-9-10-11 N=19			
					10-11-10-13 N=21			
		10			6-6-7-5 N=13			
					5-6-6-8 N=12			
		15			5-5-6-6 N=11			

POORLY GRADED SAND (SP), fine grained, brown and gray, loose to medium dense

16.0 4+/-

Boring Terminated at 16 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 8' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/26/2017 Boring Completed: 4/26/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-15

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.421697° Longitude: -82.567291°

Approximate Surface Elev: 19.8 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	MODEL LAYER	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
		2	**POORLY GRADED SAND (SP)**, fine grained, brown and gray, loose to medium dense				5-5-7-7 N=12			
							8-6-7-11 N=13			
				5	▽		5-6-10-15 N=16			
							9-9-10-15 N=19			
							8-11-14-16 N=25			
				10			11-12-13-14 N=25			
							3-3-10-13 N=13			
15.5	4.5+/-			15			9-7-50/5"			
16.0	4+/-	4	**LIMESTONE**, gray, very hard							
			Boring Terminated at 16 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-16

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.422596° Longitude: -82.5673°

Approximate Surface Elev: 19.3 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	0	19.3+/-				6-8-6-8 N=14			
							5-6-5-6 N=11	3.7		
				5	▽		5-4-6-7 N=10			
							5-5-5-6 N=10			
		8.0	11.5+/-							

POORLY GRADED SAND (SP), trace organics, fine grained, brown and gray, medium dense

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 4.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-17

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.423424° Longitude: -82.567309°

Approximate Surface Elev: 18.8 (Ft.) +/-

DEPTH ELEVATION (Ft.)

GRAPHIC LOG	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	5	▽		3-4-5-7 N=9			
					7-6-7-8 N=13			
					2-4-6-7 N=10			
					3-3-5-7 N=8			

POORLY GRADED SAND (SP), fine grained, brown and gray, loose to medium dense

8.0 11+/-

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 4.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-18

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.424246° Longitude: -82.5673°

Approximate Surface Elev: 18.8 (Ft.) +/-

DEPTH ELEVATION (Ft.)

GRAPHIC LOG	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	5	▽		2-2-3-3 N=5	4.8		
					6-8-9-11 N=17			
					3-4-4-6 N=8			
					4-4-4-8 N=8			

POORLY GRADED SAND (SP), trace organics, fine grained, brown and gray, loose to medium dense

8.0 11+/-

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 7.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-19

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.425075° Longitude: -82.567304°

Approximate Surface Elev: 18.5 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2		**POORLY GRADED SAND (SP)**, trace shell, fine grained, brown and gray, medium dense				5-7-4-5 N=11			
	2						5-4-4-5 N=8			
	2			5	▽		2-2-2-3 N=4			
	2	6.0	12.5+/-							
	2		**POORLY GRADED SAND WITH SILT (SP-SM)**, fine grained, brown and gray, medium dense				3-3-5-7 N=8		24	5
	2	8.0	10.5+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 4.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-20

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.425904° Longitude: -82.567304°

Approximate Surface Elev: 18.5 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2		**POORLY GRADED SAND (SP)**, fine grained, brown and gray, loose to medium dense	5	▽		3-2-3-3 N=5			
							2-3-3-3 N=6			
							2-1-2-3 N=3			
							7-11-15-20 N=26			
		8.0	10.5+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 4.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-21

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.426992° Longitude: -82.567296°

Approximate Surface Elev: 18.5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
			2				2-2-3-4 N=5			
							3-4-4-4 N=8			
				5	▽		2-2-2-2 N=4			
							2-3-5-9 N=8			
8.0	10.5+/-									

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-22

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.427822° Longitude: -82.567291°

Approximate Surface Elev: 18.7 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	GRAPHIC LOG	MODEL LAYER	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
			2				2-3-3-2 N=6			
							3-3-5-7 N=8			
				5	▽		3-4-4-5 N=8			
							3-3-3-3 N=6			
8.0	10.5+/-									

POORLY GRADED SAND (SP), fine grained, brown and gray, loose

Boring Terminated at 8 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-23

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

LOCATION See Exploration Plan

Latitude: 27.428622° Longitude: -82.567286°

Approximate Surface Elev: 18.3 (Ft.) +/-

GRAPHIC LOG	MODEL LAYER	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2		**POORLY GRADED SAND (SP)**, fine grained, brown and gray, loose	5	▽		3-1-2-3 N=3			
							3-3-5-8 N=8			
		8.0	10.5+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 4.5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

BORING LOG NO. B-24

PROJECT: 69th Avenue Watermain Loop

CLIENT: Manatee County Government
1022 26th Ave East

SITE: 67th Avenue Drive West
Bradenton, FL

GRAPHIC LOG	MODEL LAYER	DEPTH	LOCATION See Exploration Plan Latitude: 27.429211° Longitude: -82.567307° Approximate Surface Elev: 18.7 (Ft.) +/- ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	ORGANIC CONTENT(%)	WATER CONTENT (%)	PERCENT FINES
	2	0	**POORLY GRADED SAND (SP)**, fine grained, brown and gray, medium dense	5	▽		4-7-8-8 N=15			
							7-11-15-15 N=26			
							4-5-7-11 N=12			
							10-10-12-17 N=22			
		8.0	10.5+/-							
			Boring Terminated at 8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary Drilling

Abandonment Method:
Backfilled with grout

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Groundwater encountered at 5' while drilling*

Terracon
8260 Vico Ct Unit B
Sarasota, FL

Boring Started: 4/27/2017 Boring Completed: 4/27/2017

Drill Rig: BR-2500 Driller: SD

Project No.: HC175024

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING


Auger


Split Spoon


Shelby Tube


Macro Core


Ring Sampler


Rock Core


Grab Sample


No Recovery

WATER LEVEL


Water Initially Encountered


Water Level After a Specified Period of Time


Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(b/f)	Standard Penetration Test (blows per foot)
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength, Qu, psf**	**Standard Penetration or N-Value Blows/Ft.**	**Ring Sampler Blows/Ft.**
Very Loose	0 - 3	0 - 6	Very Soft	less than 500	0 - 1	< 3
Loose	4 - 9	7 - 18	Soft	500 to 1,000	2 - 4	3 - 4
Medium Dense	10 - 29	19 - 58	Medium-Stiff	1,000 to 2,000	4 - 8	5 - 9
Dense	30 - 50	59 - 98	Stiff	2,000 to 4,000	8 - 15	10 - 18
Very Dense	> 50	≥ 99	Very Stiff	4,000 to 8,000	15 - 30	19 - 42
			Hard	> 8,000	> 30	> 42

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

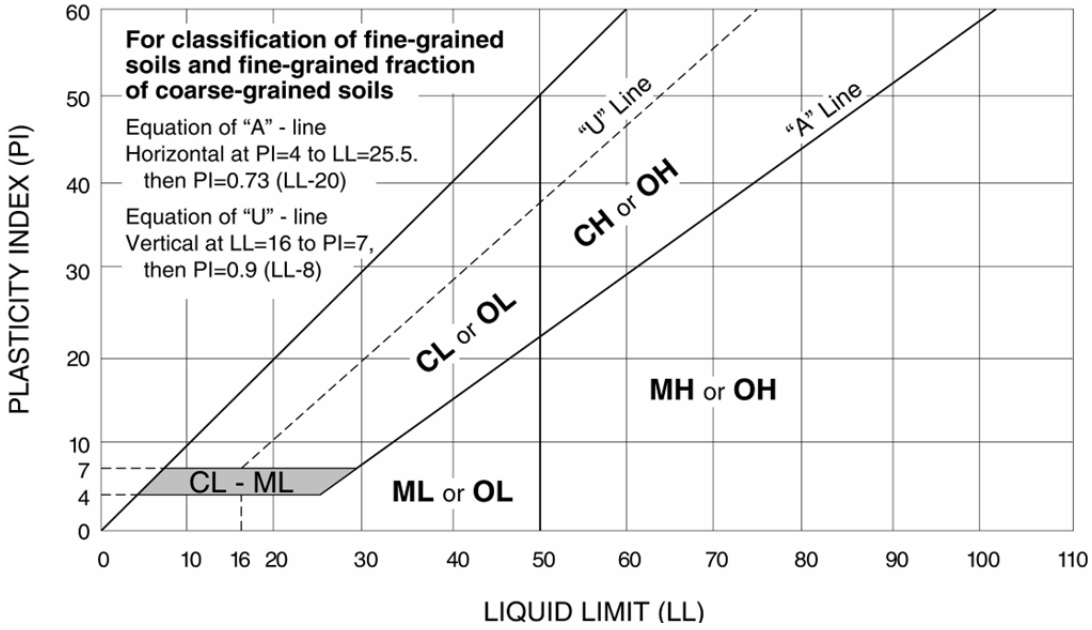
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Exhibit C-2

DESCRIPTION OF ROCK PROPERTIES

WEATHERING	
Term	**Description**
Unweathered	No visible sign of rock material weathering, perhaps slight discoloration on major discontinuity surfaces.
Slightly weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than in its fresh condition.
Moderately weathered	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a continuous framework or as corestones.
Highly weathered	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discolored rock is present either as a discontinuous framework or as corestones.
Completely weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.
Residual soil	All rock material is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.

STRENGTH OR HARDNESS		
Description	**Field Identification**	**Uniaxial Compressive Strength, PSI (MPa)**
Extremely weak	Indented by thumbnail	40-150 (0.3-1)
Very weak	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	150-700 (1-5)
Weak rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	700-4,000 (5-30)
Medium strong	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer	4,000-7,000 (30-50)
Strong rock	Specimen requires more than one blow of geological hammer to fracture it	7,000-15,000 (50-100)
Very strong	Specimen requires many blows of geological hammer to fracture it	15,000-36,000 (100-250)
Extremely strong	Specimen can only be chipped with geological hammer	>36,000 (>250)

DISCONTINUITY DESCRIPTION			
Fracture Spacing (Joints, Faults, Other Fractures)		**Bedding Spacing (May Include Foliation or Banding)**	
Description	**Spacing**	**Description**	**Spacing**
Extremely close	< ¾ in (<19 mm)	**Laminated**	< ½ in (<12 mm)
Very close	¾ in – 2-1/2 in (19 - 60 mm)	**Very thin**	½ in – 2 in (12 – 50 mm)
Close	2-1/2 in – 8 in (60 – 200 mm)	**Thin**	2 in – 1 ft (50 – 300 mm)
Moderate	8 in – 2 ft (200 – 600 mm)	**Medium**	1 ft – 3 ft (300 – 900 mm)
Wide	2 ft – 6 ft (600 mm – 2.0 m)	**Thick**	3 ft – 10 ft (900 mm – 3 m)
Very Wide	6 ft – 20 ft (2.0 – 6 m)	**Massive**	> 10 ft (3 m)

Discontinuity Orientation (Angle): Measure the angle of discontinuity relative to a plane perpendicular to the longitudinal axis of the core. (For most cases, the core axis is vertical; therefore, the plane perpendicular to the core axis is horizontal.) For example, a horizontal bedding plane would have a 0 degree angle.

ROCK QUALITY DESIGNATION (RQD*)	
Description	**RQD Value (%)**
Very Poor	0 - 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	90 - 100

*The combined length of all sound and intact core segments equal to or greater than 4 inches in length, expressed as a percentage of the total core run length.

Reference: U.S. Department of Transportation, Federal Highway Administration, Publication No FHWA-NHI-10-034, December 2009 Technical Manual for Design and Construction of Road Tunnels – Civil Elements