PUMP STATION 2032 REGIONAL FORCEMAIN IMPROVEMENTS
ST. SIMONS ISLAND, GEORGIA

ATTACHMENT

Report of Geotechnical Exploration Brunswick-Glynn County JWSC Forcemain

Ellis & Associates inc.
ECS Group of Companies
Geotechnical ▪ Construction Materials ▪ Environmental ▪ Facilities

REPORT OF
GEOTECHNICAL EXPLORATION
BRUNSWICK-GLYNN COUNTY JWSC FORCEMAIN
ST. SIMONS ISLAND, GEORGIA
E&A PROJECT NO. 35-24198
CLIENT ID: 5117

Prepared for:

Four Waters Engineering, Inc.
324 6th Avenue North
Jacksonville Beach, Florida 32250

Prepared by:

Ellis & Associates, Inc.
7064 Davis Creek Road
Jacksonville, Florida 32256

September 12, 2016

Ellis & Associates inc.
ECS Group of Companies
Geotechnical ▪ Construction Materials ▪ Environmental ▪ Facilities

September 12, 2016

Ms. Angela Bryan, P.E.
Four Waters Engineering, Inc.
324 6th Avenue North
Jacksonville Beach, Florida 32250

Reference: Report of Geotechnical Exploration
Brunswick-Glynn County JWSC Forcemain
St. Johns County, Florida
E&A Project No. 35-24198
Client ID: 5117

Dear Ms. Bryan:

Ellis & Associates, Inc. has completed a geotechnical exploration for the subject project in accordance with our proposal last revised August 11, 2016. The exploration was conducted to evaluate the general subsurface conditions within the proposed pipeline areas and to provide recommendations for site preparation, pipeline support, and Horizontal Direction Drill recommendations.

We appreciate this opportunity to be of service as your geotechnical consultant on this phase of the project and look forward to providing the materials testing and observation that will be required during the construction phase. If you have any questions, or if we may be of any further service, please contact us.

Very truly yours,
ELLIS & ASSOCIATES, INC.

Colin A. Shaw, E.I.
Staff Engineer

Robert W. Clark, P.E.
Senior Project Engineer
Registered, Georgia No. 19985

Distribution: Ms. Angela Bryan, P.E. – Four Waters Engineering, Inc. 1 pdf

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1.0 PROJECT INFORMATION

1.1 Site Location and Description

The project site is generally located along Frederica Road and Palmetto Street in St. Simons Island, Georgia. The general site location is shown as Figure 1. The surrounding areas generally consist of residential and commercial properties as well as golf courses.

1.2 Project Description

Project information has been provided to us in discussions with you. We have been provided with a copy of a site plan for the subject site indicating the route of the proposed forcemain. This plan showed the boundary limits for the project, the existing roadways adjacent to the site, and the requested boring locations.

We understand that the Brunswick-Glynn Joint Water & Sewer Commission is proposing to install a 16-inch wastewater forcemain on St. Simons Island, Georgia. The line will be approximately 10,800 feet long in total, and it will be constructed along Frederica Road from North Harrington Road to Palmetto Avenue. The forcemain will then extend along Palmetto Avenue to the Dunbar Creek Wastewater Treatment Plant. We further understand that the installation of the pipeline will be by Horizontal Direction Drill (HDD) methods with the possibility of installation by open-cut methods in select areas.

If the project information above is incorrect, then the recommendations in this report may need to be re-evaluated. Any changes in these conditions should be provided so the need for re-evaluation of our recommendations can be assessed.

2.0 FIELD EXPLORATION

A field exploration was performed during the period of September 6 to 9, 2016. The approximate boring locations are shown on the Field Exploration Plan, Figure 2. The approximate boring locations were determined in the field by our personnel using paced measurements from existing site features. This method should be considered accurate only to the degree implied by the methods used.

2.1 SPT Borings

To explore the subsurface conditions within the areas of the proposed pipeline, we located and performed 6 Standard Penetration Test (SPT) borings drilled to depths of approximately 25 feet below the existing ground surface. The borings were performed in general accordance with the methodology outlined in ASTM D 1586. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory for further evaluation. A summary of the field procedures is included in Appendix A.

3.0 VISUAL CLASSIFICATION

A geotechnical engineer classified representative soil samples obtained during our field exploration using the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. A Key to the Soil Classification System is included in Appendix A.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 General Soil Profile

Graphical presentations of the generalized subsurface conditions are presented on Figures 3 through 4. Detailed boring records are included in Appendix A. When reviewing these records it should be understood that the soil conditions will vary between the boring locations. The following paragraph summarizes the soil conditions encountered.

In general, the borings mostly encountered a surficial layer of topsoil underlain by layers of loose to medium dense fine sands and fine sands with silt (SP, SP-SM) to the boring termination depths of approximately 25 feet below the existing ground surface. Some borings encountered deeper layers of loose to medium dense silty fine sand (SM). Boring B1 encountered a layer of very loose silty fine sand with many organic fines (PT) between 2½ and 4½ feet below the existing ground surface. Boring B6 encountered a layer of very loose very clayey fine sand (SC) between approximately 12 and 17 feet below the existing ground surface.

4.2 Groundwater Level

The groundwater level was encountered at each boring location and recorded at most locations, at the time of drilling, at depths varying from 3.2 to 5.3 feet below the existing ground surface. The depth to the groundwater level at the boring locations is noted on the Generalized Subsurface Profiles and on the Log of Boring records. However, it should be anticipated the groundwater level will fluctuate due to seasonal climatic variations, surface water runoff patterns, construction operations, and other interrelated factors.

5.0 DESIGN RECOMMENDATIONS

5.1 General

Our geotechnical engineering evaluation of the site and subsurface conditions with respect to the planned construction and our recommendations for site preparation and pipeline support are based on (1) our site observations, (2) the field data obtained, and (3) our understanding of the project information as presented in this report.

Should the location of the pipeline be significantly changed, please contact us so that we can review our recommendations. Also, the discovery of any site or subsurface conditions during construction which deviate from the data obtained during this geotechnical exploration should also be reported to us for our evaluation.

The recommendations presented in the subsequent sections of this report present design and construction techniques which are appropriate for the planned construction. We recommend that we be provided the opportunity to review the final plans and earthwork specifications to verify that our recommendations have been properly interpreted and implemented.

5.2 Horizontal Directional Drilling Recommendations

We understand the proposed pipeline may be installed using HDD techniques. The borings generally encountered sandy soils throughout the subsurface profiles. It is our opinion these soil types will be conducive to the HDD operations.

The HDD operations should be performed in accordance with Section 615 of the Georgia Department of Transportation (GDOT) *Standard Specifications Construction of Transportation Systems*, (latest edition). Any soil conditions encountered that are not consistent with those contained within this report should be reported to E&A for our evaluation.

Prior to construction, the location of existing underground utility lines within the construction area should be established. Provisions should then be made to relocate interfering utilities to appropriate locations.

6.0 EARTHWORK RECOMMENDATIONS

If there are sections of the pipeline that are open excavations, earthwork as outlined in this section should be performed to provide more uniform foundation bearing conditions and to reduce the potential for post-construction settlements of the planned structures.

6.1 Clearing

Prior to construction, the location of existing underground utility lines within the construction area should be established. Provisions should then be made to relocate interfering utilities to appropriate locations. It should be noted that if underground pipes are not properly removed or plugged, they may serve as conduits for subsurface erosion which may subsequently lead to excessive settlement of overlying pavement.

6.2 Temporary Groundwater Control

The groundwater level was encountered at the boring locations at depths varying from 3.2 to 5.3 feet below the existing ground surface at the time of our exploration. Because of the need for excavation to the pipeline bearing levels followed by compaction of the soils within the upper one foot below the exposed surface, it may be necessary to install temporary groundwater control measures to dewater the area to facilitate the excavation and compaction processes. The groundwater control measures should be determined by the contractor. The water table should be maintained at least 2 feet below the required depth of excavation. The dewatering system should not be decommissioned until sufficient deadweight exists on the structures to prevent uplift or the uplift protection system as described above, if necessary, is in place.

The fine sands and fine sands with silt in excavations up to a depth of 15 feet can usually be dewatered by conventional methods such as well pointing or rim ditching (for shallow excavations). It should be noted, however, that cuts on that order may expose confined aquifers where relatively permeable sandy soils underlie less permeable zones of clayey fine sand. Therefore, it is recommended that these relatively permeable zones be dewatered to stabilize the excavation and preclude uplift boiling of the overlaying clayey zones.

6.3 Preparation of Foundation Soils

For pipelines which are anticipated to bear in sandy soils (SP and SP-SM), the soils should be excavated to the proposed bearing elevation and the exposed excavation surface should be compacted as outlined in Section 6.5. Once the pipe is installed, the trench should be backfilled with compacted structural backfill to final grade.

We recommend one of the following alternatives be implemented to provide more uniform bearing conditions, and to reduce the potential for post construction settlements of the pipelines which bear in the loose clayey soils as encountered in Boring B6 between approximately 12 and 17 feet below the existing ground surface and the loose organic soils as encountered in Boring B1 between approximately 2½ and 4½ feet below the existing ground surface.

1. It is recommended that at least one foot of the clayey soils (SC) below the pipeline inverts, if encountered at the time of excavation, be over-excavated and replaced with compacted structural backfill to final bearing elevations. If encountered at the structure's bearing level, organic soils (A-8) should be completely removed below the structures and replaced with compacted structural fill. Compacted structural fill should then be placed around and above structures and pipelines to final grade.
2. Alternatively, to reduce the amount of structural fill and over-excavation, it is recommended that a medium duty woven geotextile such as a Mirafi 600X, or equivalent, be used as barrier between compacted fill and clayey materials. If a woven geotextile is used, the amount of over-excavation can be waived for the pipeline. The geotextile should be placed in the excavation bottom and sides above the clayey soils creating a barrier between the clayey soils and structural backfill to preclude contamination of the backfill. A compacted structural fill

material should then be used to backfill to the final bearing elevation and around and above structures and pipelines to final grade.

3. As an alternative to providing compacted backfill to replace the over-excavated soils below the mid-height of the pipe, flowable fill can be utilized. Flowable fill commonly consists of a mixture of cement, fly ash, fine aggregate, and water. Design, placement, and testing of flowable fill should be in accordance with the latest edition of Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, Section 600. Additionally, if flowable fill is utilized, the geotextile can be eliminated from the design.

6.4 Excavation Protection

Excavation work will be required to meet OSHA Excavation Standard Subpart P regulations, Type C Soils. A trench box or braced sheet pile structure is anticipated for excavation support. The support structure should be designed according to OSHA sheeting and bracing requirements. We recommend a Georgia registered Professional Engineer design the sheeting/bracing system. Use of an open cut is not considered practical because it will require a large excavation to preclude slope sloughing.

6.5 Compaction of Bottom of Excavation

After installing the temporary groundwater control measures, and achieving the required depth of excavation, the exposed surface of sandy soils should be compacted by the use of hand-operated equipment. If clayey soils are at the exposed surface, it is recommended the initial fill layer be placed on top of the exposed surface subsequent to the necessary overexcavation or geotextile placement, then compacted. Typically, the material should exhibit moisture contents within ±2 percent of the Modified Proctor optimum moisture content (AASHTO T-180) during the compaction operations. Compaction should continue until densities of at least 95 percent of the Modified Proctor maximum dry density (AASHTO T-180) have been achieved within the upper one foot below the exposed surface within the pipeline excavation.

Should the bearing level soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess moisture content within the disturbed soils allowed to dissipate before recompacting.

6.6 Structural Backfill and Compaction of Structural Backfill

Structural backfill within the pipeline excavations, and in areas in which over-excavation of unsuitable soils is required below the pipeline invert elevation, should be placed in loose lifts not exceeding six inches in thickness and compacted by the use of hand-operated compaction equipment. Structural backfill is defined as a non-plastic, inorganic, granular soil having less than 10 percent material passing the No. 200 mesh sieve and containing less than 4.0 percent organic material. The sandy soils (SP and SP-SM) excavated for the structure may be used as backfill. However, it should be anticipated that the clayey soils (SC) may be difficult to dry and compact due to an inherent nature to retain moisture. Typically, the backfill material should exhibit moisture contents within ±2 percent of the Modified Proctor optimum moisture content (AASHTO T-180) during the compaction operations. Compaction should continue until densities of at least 95 percent of the Modified Proctor maximum dry density (AASHTO T-180) have been achieved within each 6-inch thick lift of the compacted structural backfill.

Because the clayey soils (SC) have an excessive fines content (i.e., greater than 15 percent), and a tendency to retain moisture which makes these soils very difficult to dry and compact, we recommend these soils not be used as structural backfill. These soils are unsuitable for use as backfill materials.

7.0 QUALITY CONTROL

A representative number of field in-place density tests should be performed in each 6-inch thick lift of compacted backfill and in the upper 12 inches below the bearing levels along the pipeline alignment. The density tests are considered necessary to verify that satisfactory compaction operations have been performed. We recommend density testing be performed at one location for every 300 feet of pipeline.

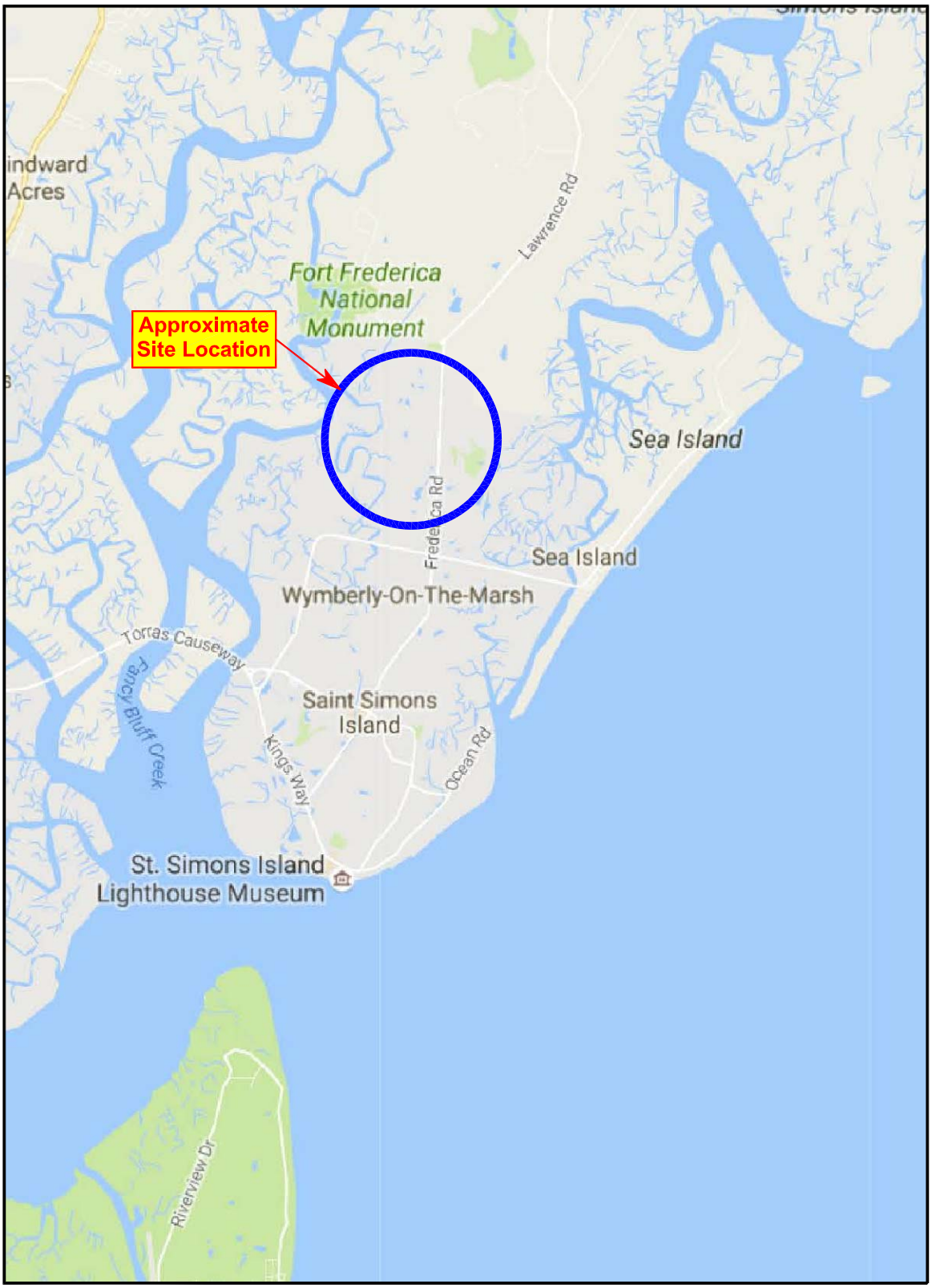
8.0 REPORT LIMITATIONS

Our geotechnical exploration has been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. Ellis & Associates, Inc. is not responsible for any independent conclusions, interpretation, opinions or recommendations made by others based on the data contained in this report.

Our scope of services was intended to evaluate the soil conditions within the zone of soil influenced by the pipeline bearing conditions. Our scope of services does not address geologic conditions such as sinkholes or soil conditions existing below the depth of the soil borings.

This report does not reflect any variations which may occur adjacent to or between soil borings. The discovery of any site or subsurface condition during construction which deviate from the data obtained during this geotechnical exploration should be reported to us for our evaluation. Also, in the event of any change to the location of the pipeline alignment, please contact us so that we can review our recommendations. We recommend that we be provided the opportunity to review the earthwork specifications to verify that our recommendations have been properly interpreted and implemented.

FIGURES



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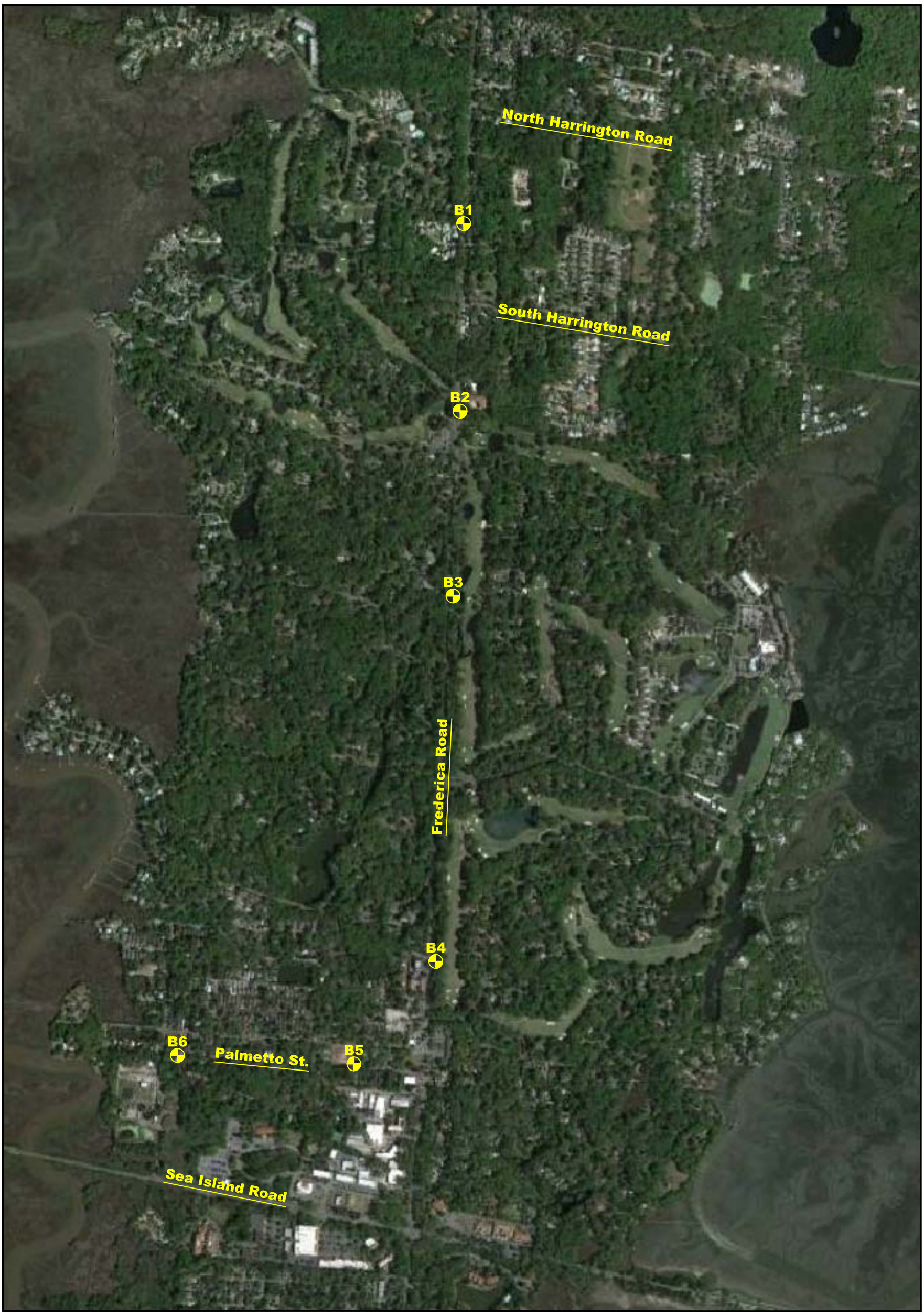
Site Location Plan

Brunswick-Glynn County JWSC Forcemain

St. Simons Island, Georgia

Date: 09/08/16	Project No.: 35-24198	Figure 1

JAS - 35-24198



LEGEND

Approximate Location of Standard Penetration Test (SPT) Boring

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Field Exploration Plan

Brunswick-Glynn County JWSC Forcemain

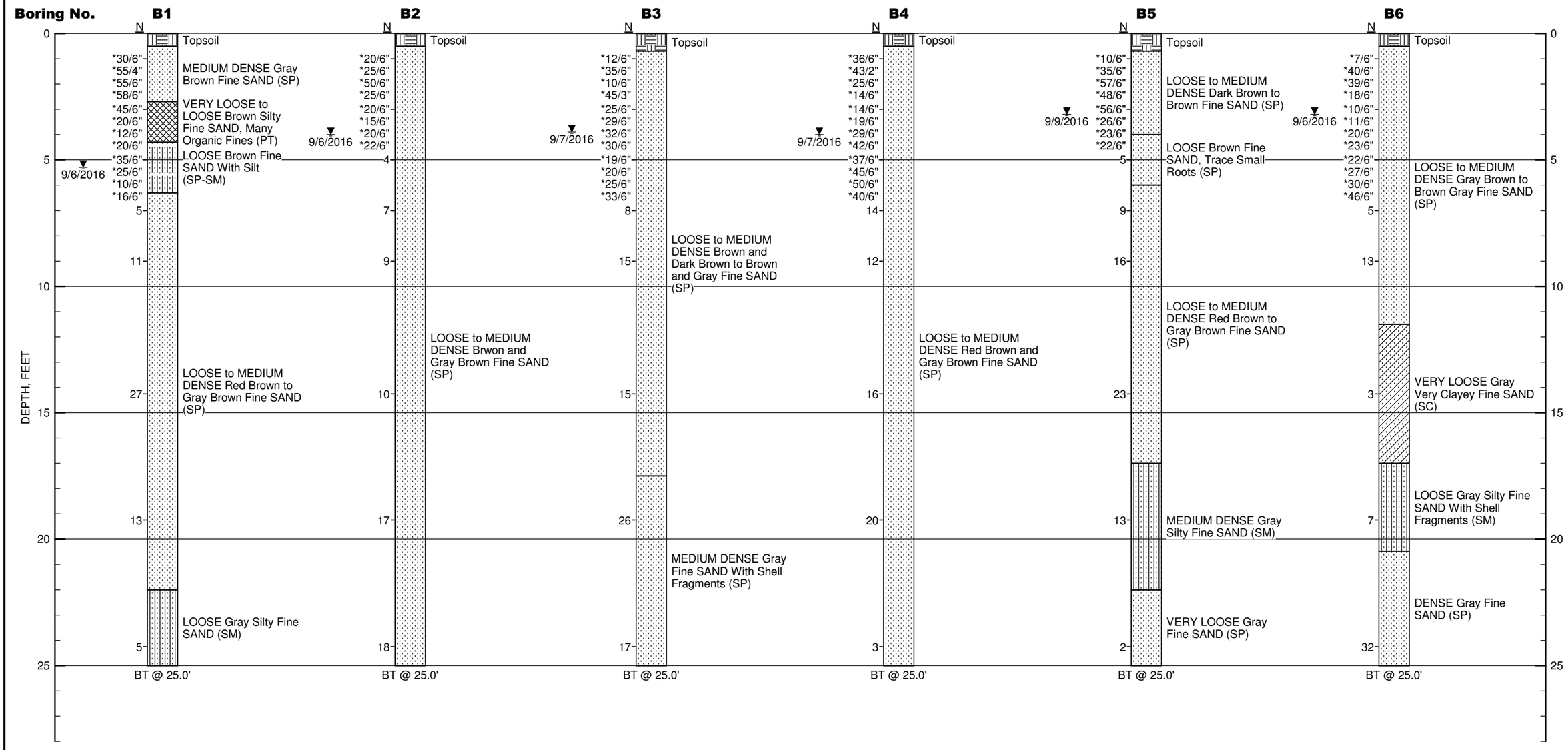
St. Simons Island, Georgia

Date: 08/06/16	Project No.: 35-24198	Figure 2

Graphical Scale

0' 800' 1,600'

JAS - 35-24198



LEGEND

- Topsoil
- Fine SAND (SP)
- Fine SAND With Silt (SP-SM)
- Silty Fine SAND (SM)
- Clayey Fine SAND (SC)
- Silty Fine SAND, Many Organic Fines (PT)

N	Standard Penetration Resistance, Blows/Foot
SP	Unified Soil Classification System
▼	Groundwater Level at Time of Drilling
*	Static Hand Cone Penetrometer Value
BT	Boring Terminated at Depth Below Grade

Generalized Subsurface Profiles

Brunswick-Glynn County JWSC Forcemain

St. Simons Island, Georgia

Ellis & Associates inc.
EGS Group of Companies

DATE: 9/12/16 | PROJ. NO.: 35-24198 | Figure 3

APPENDIX A

SOIL BORING LOGS
FIELD EXPLORATION PROCEDURES
KEY TO SOIL CLASSIFICATION

Ellis & Associates inc.
ECS Group of Companies

Project No.: 35-24198
Boring No.: B1
Sheet 1 of 1

LOG OF BORING

Project: Brunswick-Glynn County JWSC Forcemain
Client: Four Waters Engineering, Inc.
Drill Rig: ATV
Driller: C. Morgan
Boring Location: See Field Exploration Plan
Drill Rod: AWJ
Drill Mud: Super Gel-X
Casing Size:
Length of Casing:
Groundwater Depth: 5.3 ft Time: Drilling Date: 9/6/16
Boring Begun: 9/6/16
Boring Completed: 9/6/16

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT ○ / MOISTURE CONTENT + / LIQUID LIMIT ◇ (%)	SHEAR STRENGTH (ksf)
	0		Topsoil	*30/6"					
1			MEDIUM DENSE Gray Brown Fine SAND (SP)	*55/4" *55/6" *58/6" *45/6"					
2			VERY LOOSE to LOOSE Brown Silty Fine SAND, Many Organic Fines (PT)	*20/6" *12/6" *20/6"					
3	5		LOOSE Brown Fine SAND With Silt (SP-SM)	*35/6" *25/6" *10/6" *16/6"					
4			LOOSE to MEDIUM DENSE Red Brown Fine SAND (SP)	2 2 3 4	5				
5	10			4 5 6 7	11				
6	15			7 13 14	27				
			MEDIUM DENSE Gray Brown Fine SAND (SP)						
7	20			5 5 8	13				
			LOOSE Gray Silty Fine SAND (SM)						
8	25			2 2 3	5				

Boring Terminated @ 25 ft.

Remarks * = Static Hand Cone Penetrometer Value.

SHEAR STRENGTH (ksf): Pocket Penetrometer Undisturbed Sample; Pocket Penetrometer Disturbed Sample; Torvane; Unconfined Compression; Triaxial Compression

LOG OF BORING 35-24198.GPJ ELLIS ASSOCIATES.GDT 9/12/16

Ellis & Associates inc.
ECS Group of Companies

Project No.: 35-24198
Boring No.: B2
Sheet 1 of 1

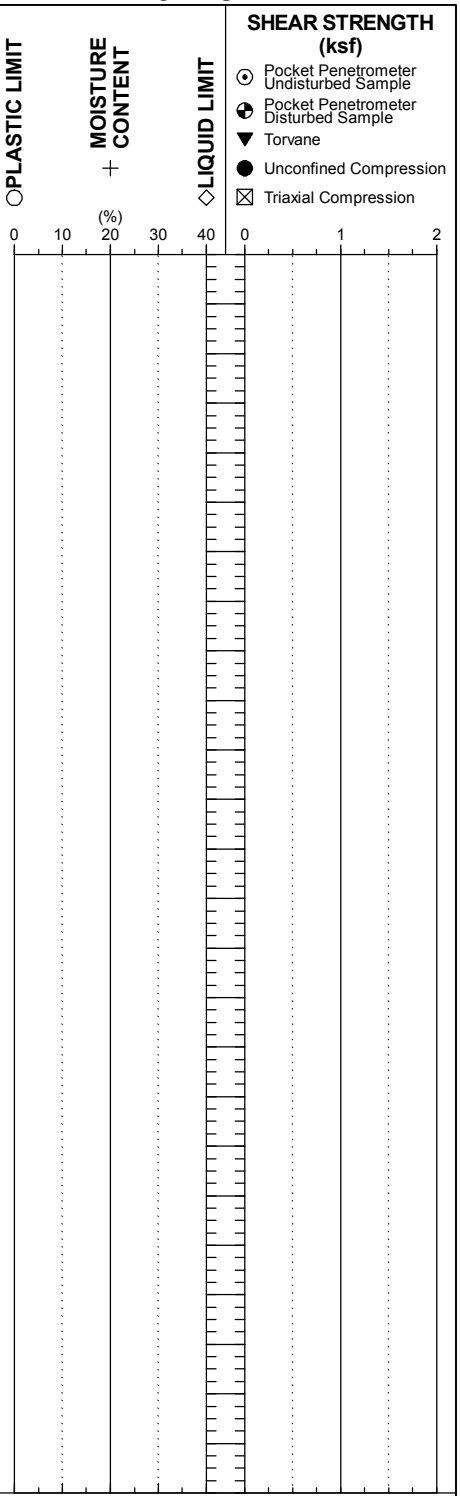
LOG OF BORING

Project: Brunswick-Glynn County JWSC Forcemain
Client: Four Waters Engineering, Inc.
Drill Rig: ATV
Driller: C. Morgan
Boring Location: See Field Exploration Plan
Drill Rod: AWJ
Drill Mud: Super Gel-X
Casing Size:
Length of Casing:
Groundwater Depth: 4 ft Time: Drilling Date: 9/6/16
Boring Begun: 9/6/16
Boring Completed: 9/6/16

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Topsoil	*20/6"			
1			LOOSE to MEDIUM DENSE Brown Fine SAND (SP)	*25/6"			
				*50/6"			
				*25/6"			
2				*20/6"			
				*15/6"			
				*20/6"			
				*22/6"			
			LOOSE Gray Brown Fine SAND (SP)	1			
				2			
3	5			2	4		
				3			
				3			
				3			
4				4	7		
				5			
				4			
				4			
5				5	9		
				5			
	10						
			LOOSE Brown Fine SAND (SP)				
				2			
				4			
6				6	10		
	15						
			MEDIUM DENSE Gray Brown Fine SAND (SP)				
				6			
7				7			
	20			10	17		
				8			
8				9			
	25			9	18		

Boring Terminated @ 25 ft.

Remarks * = Static Hand Cone Penetrometer Value.



LOG OF BORING 35-24198.GPJ ELLIS ASSOCIATES.GDT 9/12/16

Ellis & Associates inc.
ECS Group of Companies

Project No.: 35-24198
Boring No.: B3
Sheet 1 of 1

LOG OF BORING

Project: Brunswick-Glynn County JWSC Forcemain
Client: Four Waters Engineering, Inc.
Boring Location: See Field Exploration Plan
Drill Rig: ATV
Driller: C. Morgan
Drill Rod: AWJ
Drill Mud: Super Gel-X
Casing Size:
Length of Casing:
Groundwater Depth: 3.9 ft Time: Drilling Date: 9/7/16
Boring Begun: 9/7/16
Boring Completed: 9/7/16

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Topsoil	*12/6"			
1			LOOSE to MEDIUM DENSE Brown Fine SAND (SP)	*35/6"			
				*10/6"			
				*45/3"			
				*25/6"			
2			LOOSE Dark Brown Fine SAND (SP)	*29/6"			
				*32/6"			
				*30/6"			
				*19/6"			
3	5		LOOSE to MEDIUM DENSE Brown Fine SAND (SP)	*20/6"			
				*25/6"			
				*33/6"			
				2			
4				3			
				5	8		
				5			
				6			
5				6			
				9	15		
	10			12			
			MEDIUM DENSE Gray Fine SAND (SP)				
				5			
6				7			
	15			8	15		
			MEDIUM DENSE Gray Fine SAND With Shell Fragments (SP)				
				7			
7				11			
	20			15	26		
				5			
8				7			
	25			10	17		

Boring Terminated @ 25 ft.

Remarks * = Static Hand Cone Penetrometer Value.

PLASTIC LIMIT ○ | MOISTURE CONTENT + (%) | LIQUID LIMIT ◇
0 10 20 30 40

SHEAR STRENGTH (ksf)
⊙ Pocket Penetrometer Undisturbed Sample
◕ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

LOG OF BORING 35-24198.GPJ ELLIS ASSOCIATES.GDT 9/12/16

Ellis & Associates inc.
ECS Group of Companies

Project No.: 35-24198
Boring No.: B4
Sheet 1 of 1

LOG OF BORING

Project: Brunswick-Glynn County JWSC Forcemain
Client: Four Waters Engineering, Inc.
Drill Rig: ATV
Driller: C. Morgan
Boring Location: See Field Exploration Plan
Drill Rod: AWJ
Drill Mud: Super Gel-X
Casing Size:
Length of Casing:
Groundwater Depth: 4 ft Time: Drilling Date: 9/7/16
Boring Begun: 9/7/16
Boring Completed: 9/7/16

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Topsoil	*36/6"			
1			MEDIUM DENSE to LOOSE Red Brown Fine SAND (SP)	*43/2" *25/6" *14/6" *14/6"			
2			LOOSE to MEDIUM DENSE Gray Brown Fine SAND (SP)	*19/6" *29/6" *42/6" *37/6"			
3	5		MEDIUM DENSE Medium Brown Fine SAND (SP)	*45/6" *50/6" *40/6"			
4				4 7 7	14		
5				5 5 5 7	12		
	10			5			
			MEDIUM DENSE Gray Brown Fine SAND (SP)				
6				5 7 9	16		
	15						
			MEDIUM DENSE to VERY LOOSE Brown Gray Fine SAND (SP)				
7				6 9 11	20		
	20						
8				2 1 2	3		
	25		Boring Terminated @ 25 ft.				

PLASTIC LIMIT ○ | MOISTURE CONTENT + (%) | LIQUID LIMIT ◇

SHEAR STRENGTH (ksf)
- ⊙ Pocket Penetrometer Undisturbed Sample
- ◕ Pocket Penetrometer Disturbed Sample
- ▼ Torvane
- ● Unconfined Compression
- ⊠ Triaxial Compression

Remarks * = Static Hand Cone Penetrometer Value.

LOG OF BORING 35-24198.GPJ ELLIS ASSOCIATES.GDT 9/12/16

Ellis & Associates inc.
ECS Group of Companies

Project No.: 35-24198
Boring No.: B5
Sheet 1 of 1

LOG OF BORING

Project: Brunswick-Glynn County JWSC Forcemain
Client: Four Waters Engineering, Inc.
Drill Rig: ATV
Driller: C. Morgan
Boring Location: See Field Exploration Plan
Drill Rod: AWJ
Drill Mud: Super Gel-X
Casing Size:
Length of Casing:
Groundwater Depth: 3.2 ft Time: Drilling Date: 9/9/16
Boring Begun: 9/9/16
Boring Completed: 9/9/16

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Topsoil	*10/6"			
1			LOOSE to MEDIUM DENSE Dark Brown Fine SAND (SP)	*35/6" *57/6" *48/6" *56/6"			
2			MEDIUM DENSE to LOOSE Brown Fine SAND (SP) ▼	*26/6" *23/6" *22/6"			
			LOOSE Brown Fine SAND, Trace Small Roots (SP)	1 1			
3	5			4 3	5		
			LOOSE to MEDIUM DENSE Red Brown Fine SAND (SP)	2 2			
4				7 8	9		
				5 7			
5				9 11	16		
	10						
			MEDIUM DENSE Gray Brown Fine SAND (SP)				
				5			
6				11 12	23		
	15						
			MEDIUM DENSE Gray Silty Fine SAND (SM)				
				5 7			
7				6	13		
	20						
			VERY LOOSE Gray Fine SAND (SP)				
				1 1			
8				1	2		
	25		Boring Terminated @ 25 ft.				

SHEAR STRENGTH (ksf)
- Pocket Penetrometer Undisturbed Sample
- Pocket Penetrometer Disturbed Sample
- Torvane
- Unconfined Compression
- Triaxial Compression

PLASTIC LIMIT ○ | MOISTURE CONTENT + (%) | LIQUID LIMIT ◇
0 10 20 30 40
0 1 2

Remarks * = Static Hand Cone Penetrometer Value.

LOG OF BORING 35-24198.GPJ ELLIS ASSOCIATES.GDT 9/12/16

Ellis & Associates inc.
ECS Group of Companies

Project No.: 35-24198
Boring No.: B6
Sheet 1 of 1

LOG OF BORING

Project: Brunswick-Glynn County JWSC Forcemain
Client: Four Waters Engineering, Inc.
Drill Rig: ATV
Driller: C. Morgan
Boring Location: See Field Exploration Plan
Drill Rod: AWJ
Drill Mud: Super Gel-X
Casing Size:
Length of Casing:
Groundwater Depth: 3.2 ft Time: Drilling Date: 9/6/16
Boring Begun: 9/6/16
Boring Completed: 9/6/16

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER 6 IN.	N Value	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT ○ / MOISTURE CONTENT + / LIQUID LIMIT ◇ (%)	SHEAR STRENGTH (ksf)
	0		Topsoil	*7/6"					
1			MEDIUM DENSE to LOOSE Gray Brown Fine SAND (SP)	*40/6" *39/6" *18/6"					
2			LOOSE to MEDIUM DENSE Brown Gray Fine SAND (SP)	*10/6" *11/6" *20/6"					
3	5			*23/6" *22/6" *27/6" *30/6" *46/6"					
4				2 2 3 4	5				
5				4 7 6	13				
	10			7					
			VERY LOOSE Gray Very Clayey Fine SAND (SC)						
6				WOH/6" 2 1	3				
	15								
			LOOSE Gray Silty Fine SAND With Shell Fragments (SM)						
7				3 3 4	7				
	20								
			DENSE Gray Fine SAND (SP)						
8				8 15 17	32				
	25		Boring Terminated @ 25 ft.						

Remarks * = Static Hand Cone Penetrometer Value.

SHEAR STRENGTH (ksf): Pocket Penetrometer Undisturbed Sample; Pocket Penetrometer Disturbed Sample; Torvane; Unconfined Compression; Triaxial Compression

LOG OF BORING 35-24198.GPJ ELLIS ASSOCIATES.GDT 9/12/16

FIELD EXPLORATION PROCEDURES

Standard Penetration Test (SPT) Borings

The Standard Penetration Test (SPT) borings were made in general accordance with the latest revision of ASTM D 1586, "Penetration Test and Split-Barrel Sampling of Soils". The borings were advanced by rotary (or "wash-n-chop") drilling techniques. At 2 ½ to 5 foot intervals, a split-barrel sampler inserted to the borehole bottom and driven 18 inches into the soil using a 140 pound hammer falling on the average 30 inches per hammer blow. The number of hammer blows for the final 12 inches of penetration is termed the "penetration resistance, blow count, or N-value". This value is an index to several in-place geotechnical properties of the material tested, such as relative density and Young's Modulus.

After driving the sampler 18 inches (or less if in hard rock-like material), the sampler was retrieved from the borehole and representative samples of the material within the split-barrel were containerized and sealed. After completing the drilling operations, the samples for each boring were transported to our laboratory where they were examined by our engineer in order to verify the driller's field classification. The retrieved samples will be kept in our facility for a period of six (6) months unless directed otherwise.

Ellis & Associates inc.

KEY TO SOIL CLASSIFICATION

Description of Compactness or Consistency in Relation
To Standard Penetration Resistance

Granular Materials		
Relative Density	**Safety Hammer SPT N-Value (Blow/Foot)**	**Automatic Hammer SPT N-Value (Blow/Foot)**
Very Loose	Less than 4	Less than 3
Loose	4 – 10	3 – 8
Medium Dense	10 – 30	8 – 24
Dense	30 – 50	24 – 40
Very Dense	Greater than 50	Greater than 40

Silts and Clays		
Consistency	**Safety Hammer SPT N-Value (Blow/Foot)**	**Automatic Hammer SPT N-Value (Blow/Foot)**
Very Soft	Less than 2	Less than 1
Soft	2 – 4	1 – 3
Firm	4 – 8	3 – 6
Stiff	8 – 15	6 – 12
Very Stiff	15 – 30	12 – 24
Hard	Greater than 30	Greater than 24

DESCRIPTION OF SOIL COMPOSITION**

(Unified Soil Classification System)

MAJOR DIVISION		Group Symbol	LABORATORY CLASSIFICATION CRITERIA		SOIL DESCRIPTION
			FINER THAN 200 SIEVE %	SUPPLEMENTARY REQUIREMENTS	
Coarse grained (over 50% by weight coarser than No. 200 sieve)	Gravelly soils (over half of coarse fraction larger than No. 4)	GW	<5*	D_{60}/D_{10} greater than 4, $D_{30}^2 / (D_{60} \times D_{10})$ between 1 & 3	Well graded gravels, sandy gravels
		GP	<5*	Not meeting above gradation for GW	Gap graded or uniform gravels, sandy gravels
		GM	>12*	PI less than 4 or below A-line	Silty gravels, silty sandy gravels
		GC	>12*	PI over 7 above A-line	Clayey gravels, clayey sandy gravels
	Sandy soils (over half of coarse fraction finer than No. 4)	SW	<5*	D_{60}/D_{10} greater than 6, $D_{30}^2 / (D_{60} \times D_{10})$ between 1 & 3	Well graded sands, gravelly sands
		SP	<5*	Not meeting above gradation requirements	Gap graded or uniform sands, gravelly sands
		SM	>12*	PI less than 4 or below A-line	Silty sands, silty gravelly sands
		SC	>12*	PI over 7 and above A-line	Clayey sands, clayey gravelly sands
Fine grained (over 50% by weight finer than No. 200 sieve)	Low compressibility (liquid limit less than 50)	ML	Plasticity chart		Silts, very fine sands, silty or clayey fine sands, micaceous silts
		CL	Plasticity chart		Low plasticity clays, sandy or silty clays
		OL	Plasticity chart, organic odor or color		Organic silts and clays of low plasticity
	High compressibility (liquid limit more than 50)	MH	Plasticity chart		Micaceous silts, diatomaceous silts, volcanic ash
		CH	Plasticity chart		Highly plastic clays and sandy clays
		OH	Plasticity chart, organic odor or color		Organic silts and clays of high plasticity
Soils with fibrous organic matter		PT	Fibrous organic matter; will char, burn or glow		Peat, sandy peats, and clayey peat

* For soils having 5 to 12 percent passing the No. 200 sieve, use a dual symbol such as SP-SM.
** Standard Classification of Soils for Engineering Purposes (ASTM D 2487)

SAND/GRAVEL DESCRIPTION MODIFIERS	
Modifier	**Sand/Gravel Content**
Trace	<15%
With	15% to 29%
Sandy/Gravelly	>29%

ORGANIC MATERIAL MODIFIERS	
Modifier	**Organic Content**
Trace	1% to 2%
Few	2% to 4%
Some	4% to 8%
Many	>8%

SILT/CLAY DESCRIPTION MODIFIERS	
Modifier	**Silt/Clay Content**
Trace	<5%
With	5% to12%
Silty/Clayey	13% to 35%
Very	>35%

PUMP STATION 2032 REGIONAL FORCEMAIN IMPROVEMENTS
ST. SIMONS ISLAND, GEORGIA

ATTACHMENT

Test Hole Data: JWSC LS2032 Regional Forcemain Improvements Project
Test Holes 1 – 49

RHD Services **9/10/2016**

JWSC LS2032 Regional Forcemain Improvements Project - Test Hole Worksheet

TH # (as marked in field)	Utility	Pavement/Soil	Top of Utility to Ground Depth	Utility Size	Material	Notes
1	Gas	Soil	2' 5"	2"	Plastic	
2	Telecom	Soil	3' 6"	1.5"	Plastic	
3-A	Water	Soil	4' 0"	12"	PVC	
3-B	Telecom	Soil	6' 2"	1.5"	Plastic	
4	Water	Soil	3' 10"	12'	A/C	A/C: Asbestos Pipe
5	Telecom	Soil	10' 0"	---	---	Used probing rod to verify utility, utility below water table
6	Sanitary FM	Soil	8' 0"	---	PVC	High water table
7	Water	Soil	2' 8"	12"	PVC	
8	Water	Soil	1' 9"	12"	PVC	
9	Sanitary FM	Soil	2' 9"	10"	PVC	
10	Telecom	Soil	10' 9"	1.5"		FO
11	Water	Soil	2' 9"	8"	PVC	
12	Gas	Soil	3' 0"	4"	Steel	
13	Water	Soil	3' 0"	12"	A/C	
14	Telecom	Soil	3' 4"	various 1.5"	Plastic	
15	Sanitary FM	Soil	5' 5"	10"	Plastic	
16	Gas	Soil	2' 7"	2"	Plastic	
16	Telecom	Soil	aprox 8'	---	---	High water table
17	Sanitary FM	Soil	4' 0"	8"	Plastic	
18	Sanitary FM	Soil	2' 6"	8"	Plastic	
19	Water	Soil	4' 5"	8"	A/C	
20	Sanitary FM	Soil	4' 5"	8"	Plastic	
21	Telecom	Soil	4' 5"	2"	Cable	
22	Power	Soil	8' 4"	---	Conduit	High water table
23	Sanitary FM	Soil	2' 8"	8"	PVC	
24	Telecom	Soil	2' 4"	FO cable	FO	
25	Sanitary FM	Soil	3' 3'	8"	PVC	
26	Telecom	Soil	3' 0"	Various 1.5"	PVC & Concrete	
27	Sanitary FM	Soil	3' 2"	8"	PVC	
28	---	---	---	---	---	Unused Number
29	Sanitary FM	Soil	2' 10"	8"	PVC	
30	Gas	Soil	3' 2"	4"	Steel	
31	Water	Pavement	3' 3"	---	Steel	In pavement. Depth by GPR
32	Sanitary FM	Soil	2' 4"	8"	PVC	
33	Telecom	Soil	3' 0"	FO cable	FO	
34	Gas	Soil	2' 10"	4"	Steel	
35	Telecom	Soil	2' 7"	1.5"	Cable	
36	Sanitary FM	Soil	2' 9"	8"	PVC	In pavement. Depth by GPR
37	Gas	Soil	2' 10"	4"	Plastic	
38	Power	Soil	6' 11"	Aprox. 3"	Cable	
39	Water	Pavement	3' 5"		Plastic	In pavement. Depth by GPR
40	Water	Soil	3' 5"	6"	A/C	
41	Telecom	Soil	2' 9"	Aprox. 2"	FO	
42	Gas	Soil	3' 0"	2"	Steel	
43	Water	Soil	3' 4"	12"	A/C	
44	Gas	Pavement	2' 0"	---	---	In pavement. Depth by GPR
45	Water	Pavement	2' 9"	---	---	In pavement. Depth by GPR
46	Water	Soil	3' 3"	2"	A/C	
47	Gas	Pavement	2' 5"	---	Plastic	In pavement. Depth by GPR
48	Telecom	Soil	4' 3"	Aprox. 1"	FO	
48	Telecom	Soil	2' 4"	Aprox. 1"	FO	
49	Gas	Pavement	4' 0"	---	Plastic	In pavement. Depth by GPR

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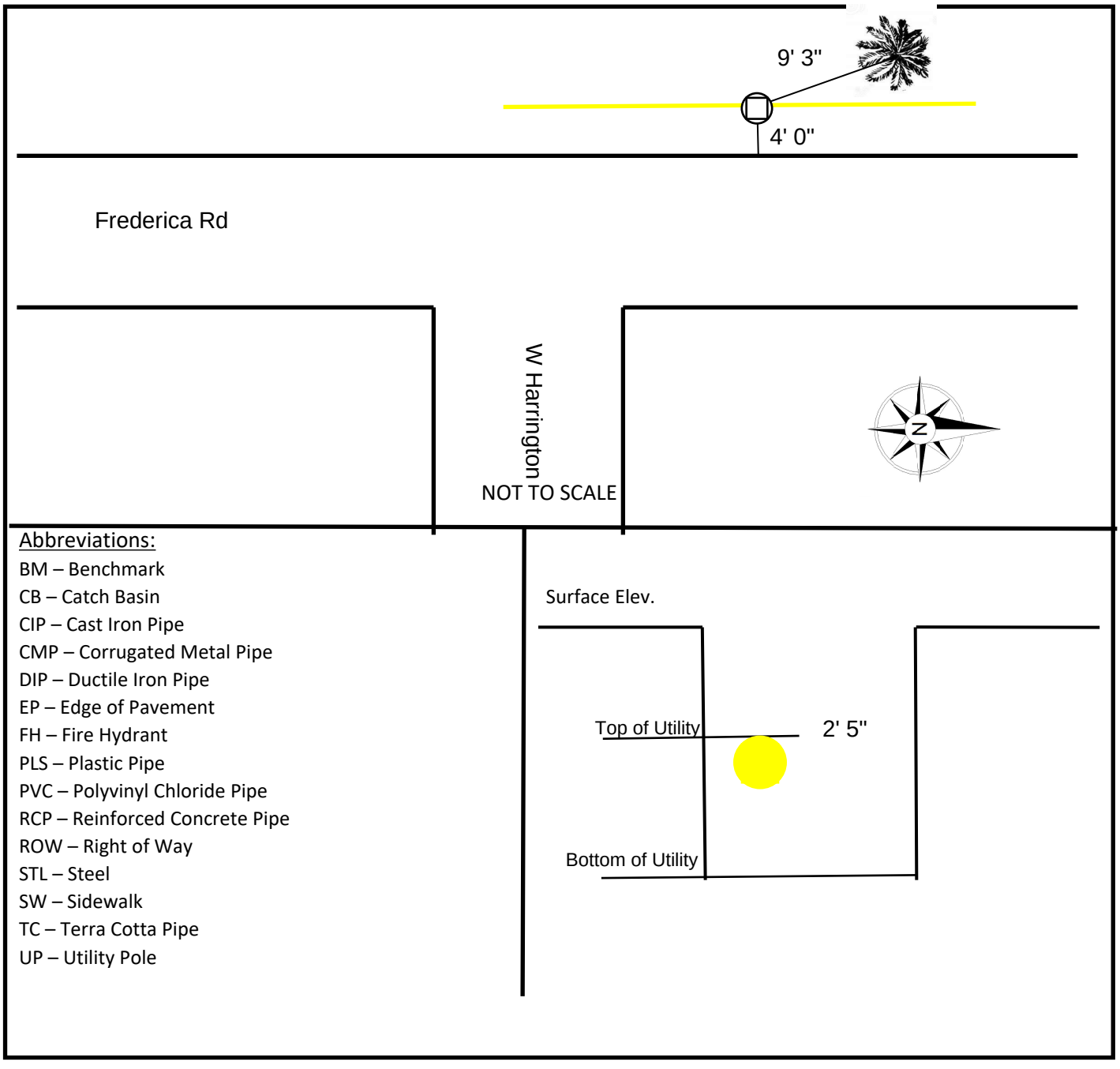
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering Project: Sea Island Road Test Hole# 1
General Location: Fredrica Rd & W. Harrington Date: 8-2-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Gas Size: 2" Material: PLS Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: N/A Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole


TH 1

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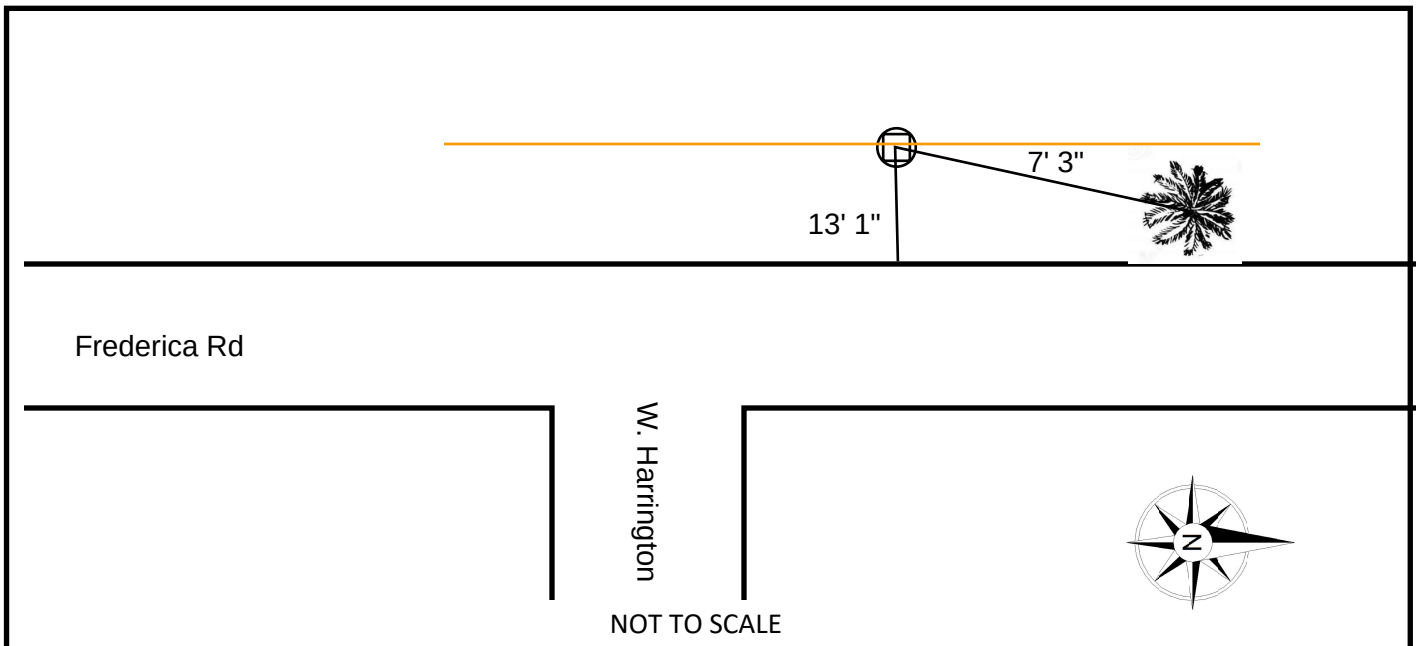
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 2
General Location: Fredrica Rd. & W. Harrington Date: 8-2-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Telecom Size: 1.5" Material: PLS Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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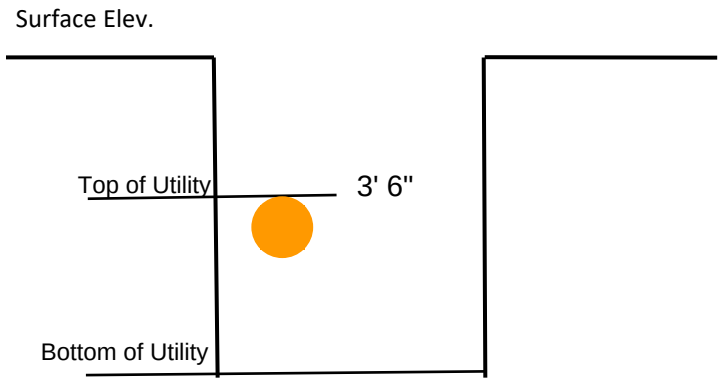

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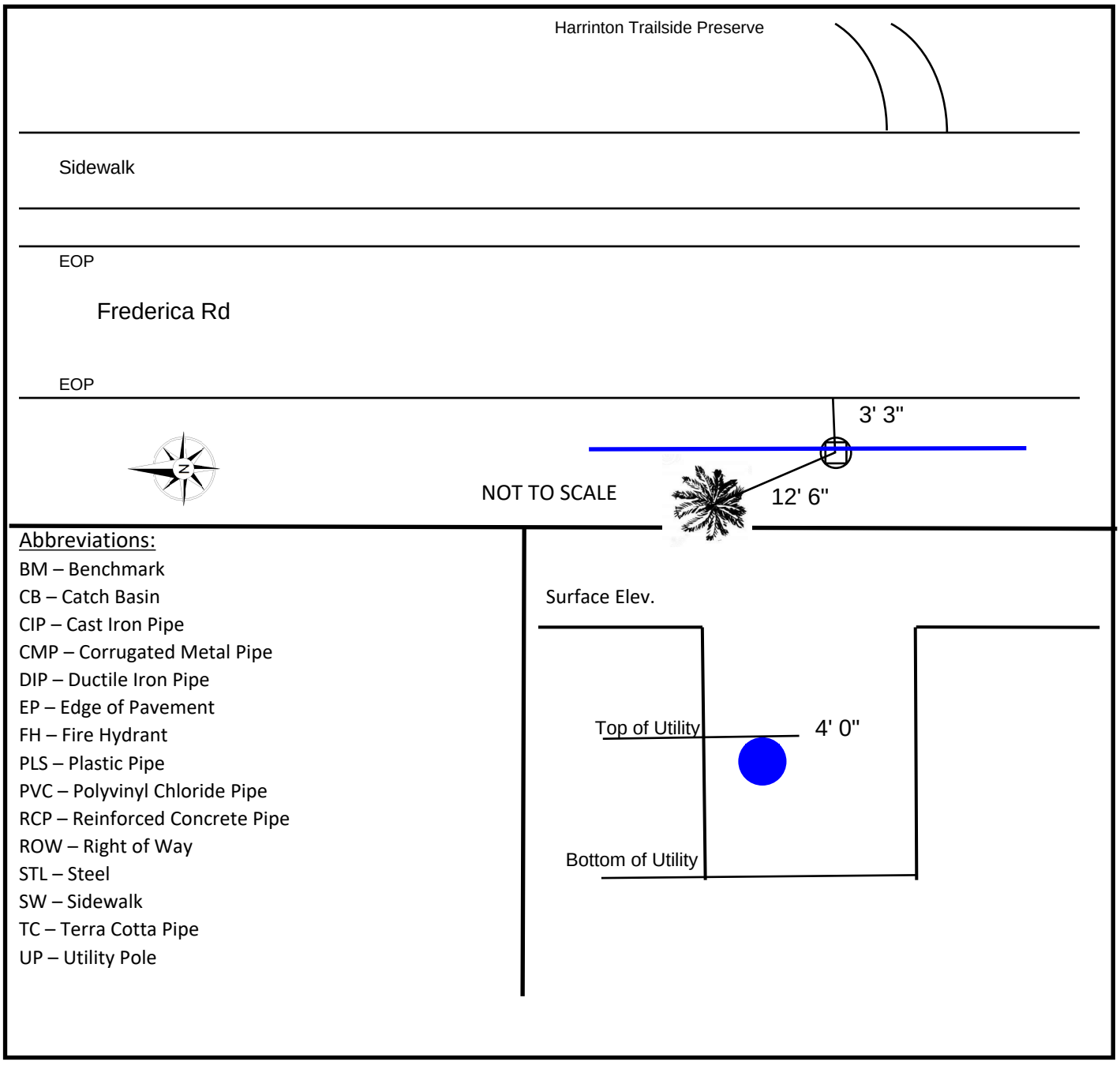
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 3-A
General Location: Fredrica Rd Date: 8-2-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Water Size: 12" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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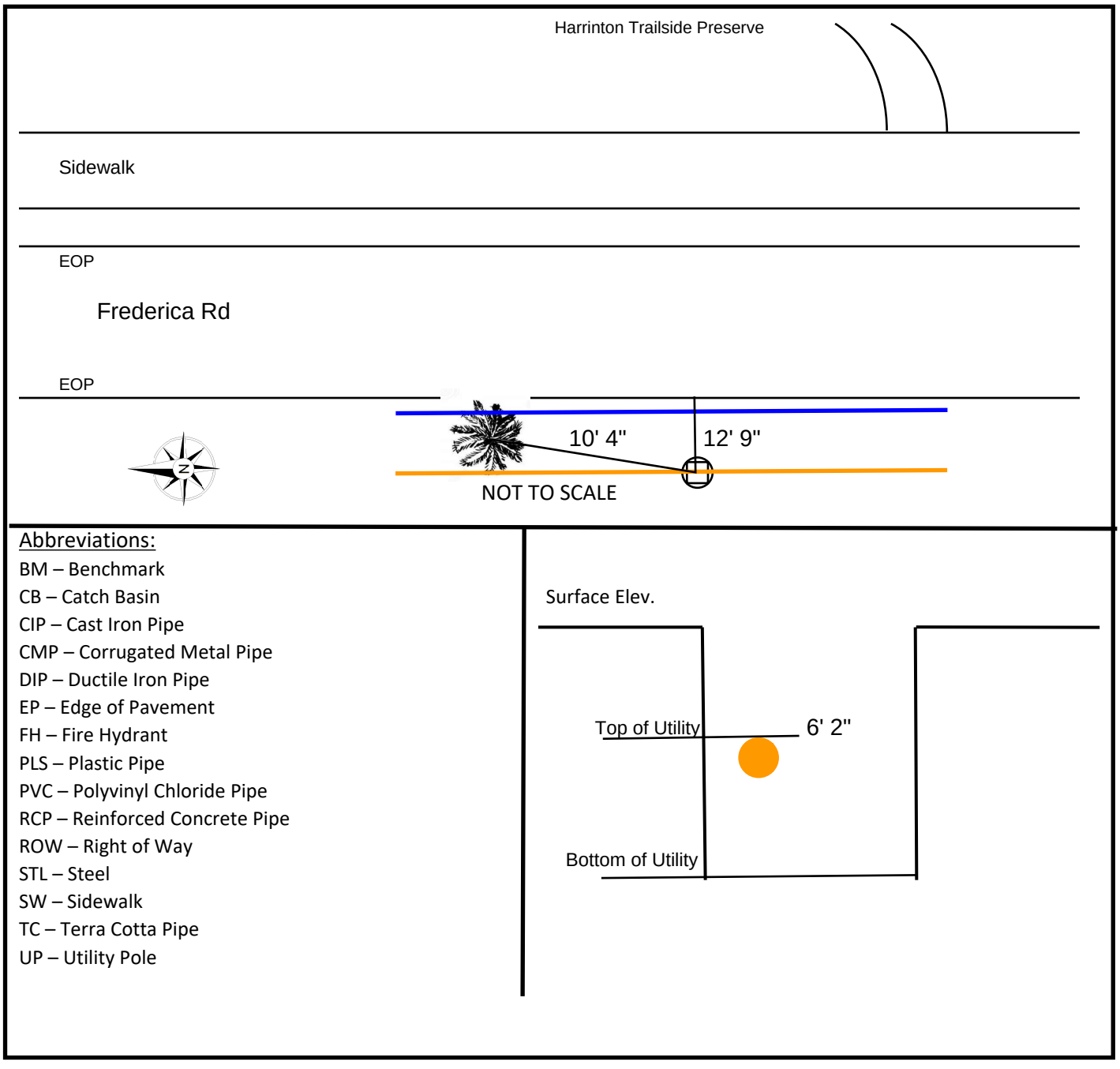
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 3-B
General Location: Fredrica Rd Date: 8-2-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Telecom Size: 1.5" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole

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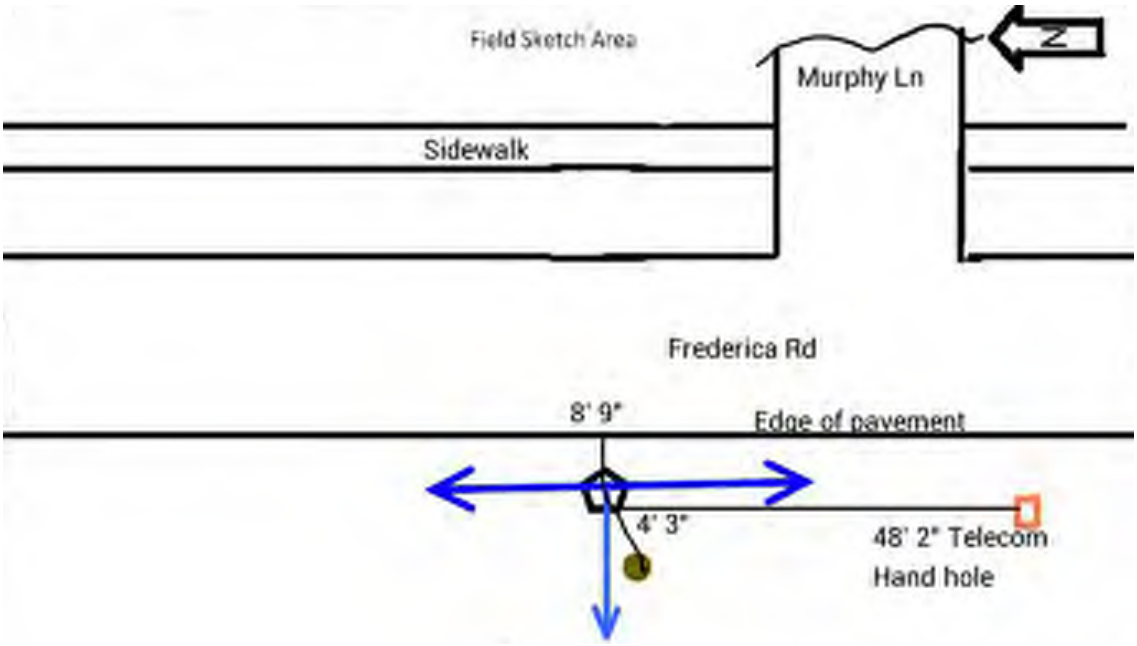
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 4
General Location: Fredrica Rd & Murphy Lane Date: 8-2-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Water Size: 12" Material: A/C Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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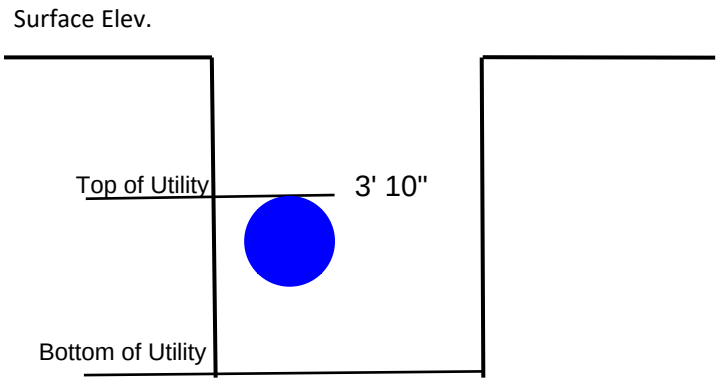


WARNING
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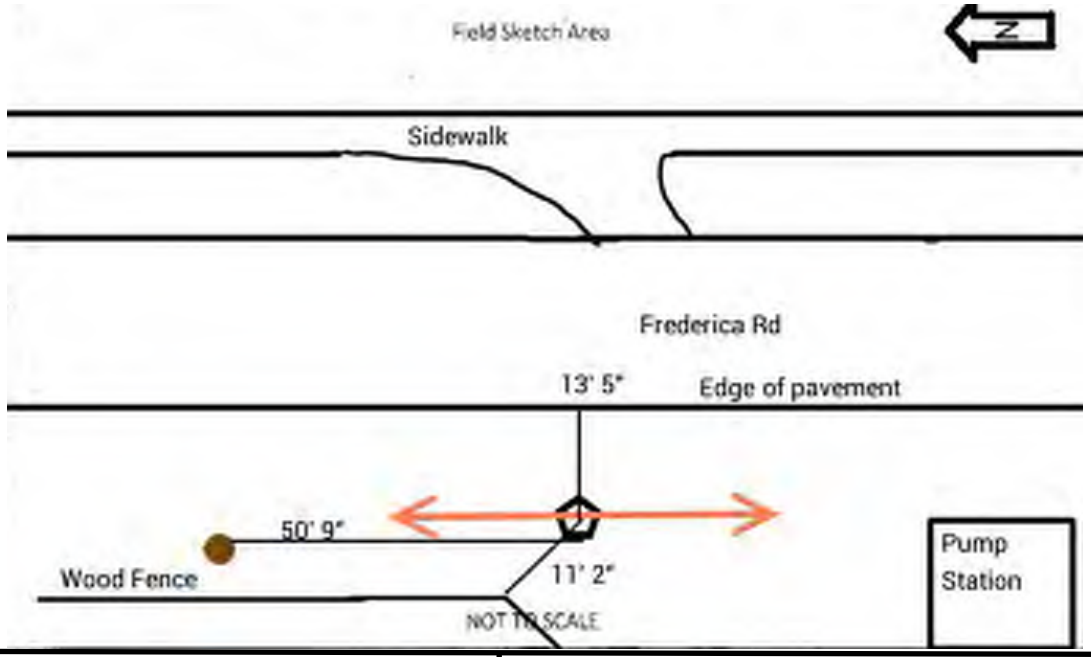
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 5
General Location: Fredrica Rd Date: 8-17-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Telecom Size: Material: Cable Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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SW – Sidewalk
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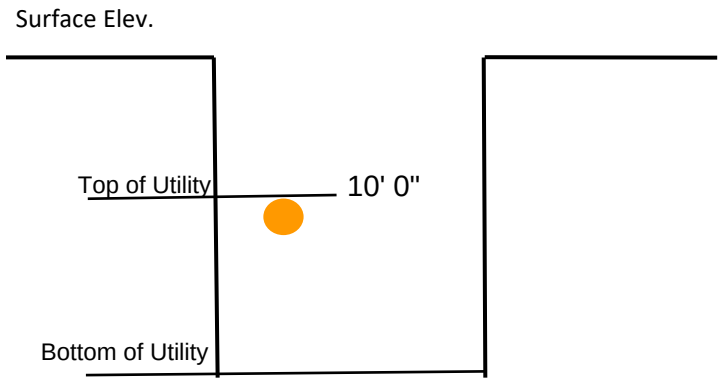
UP – Utility Pole




Can't see the pipe
Due too water in
the hole.

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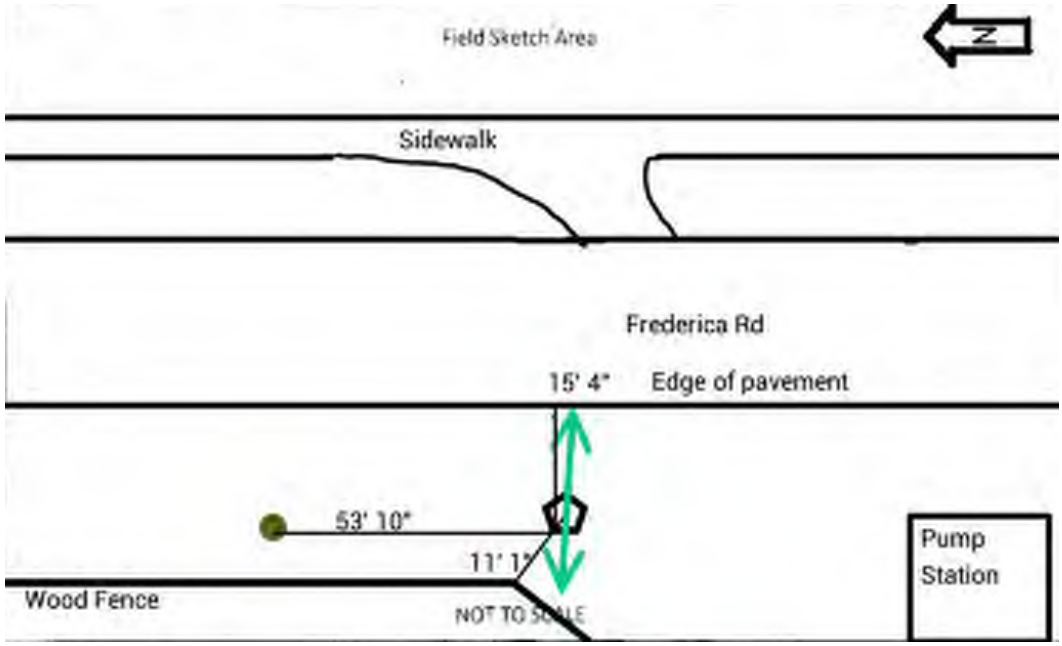
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 6
General Location: Fredrica Rd Date: 8-17-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes: High water table, unable to get a good view of the pipe
Utility: Sewer Size: Unknown Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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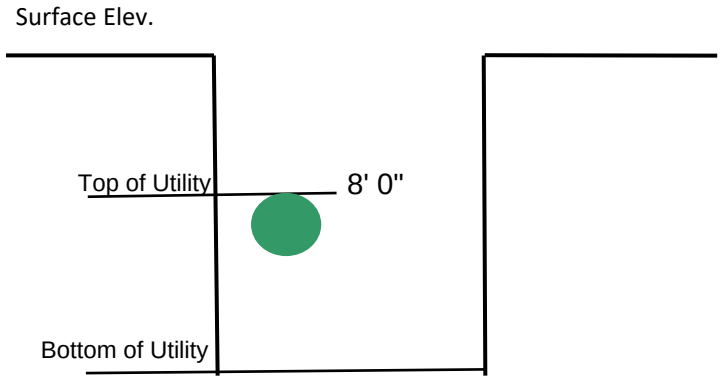


Can't see the pipe
Due too water in
the hole.

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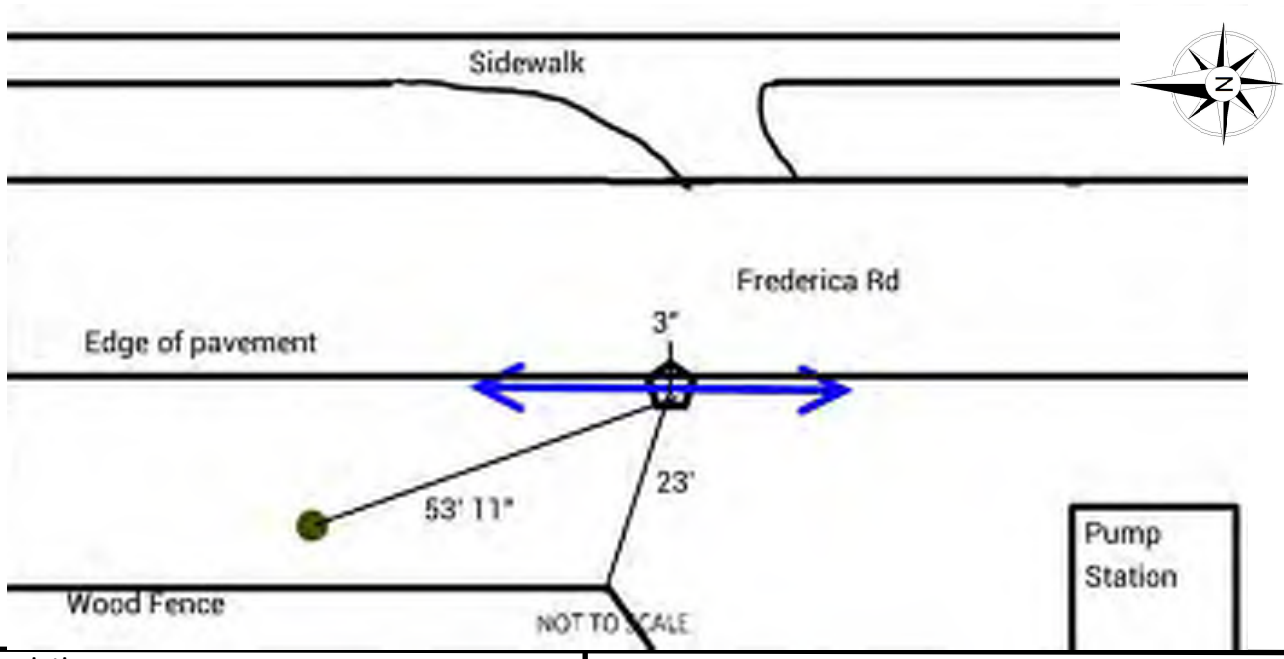
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 7
General Location: Fredrica Rd Date: 8-18-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Water Size: 12" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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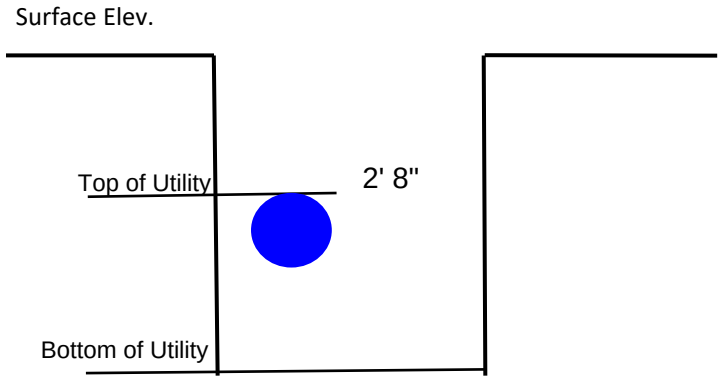

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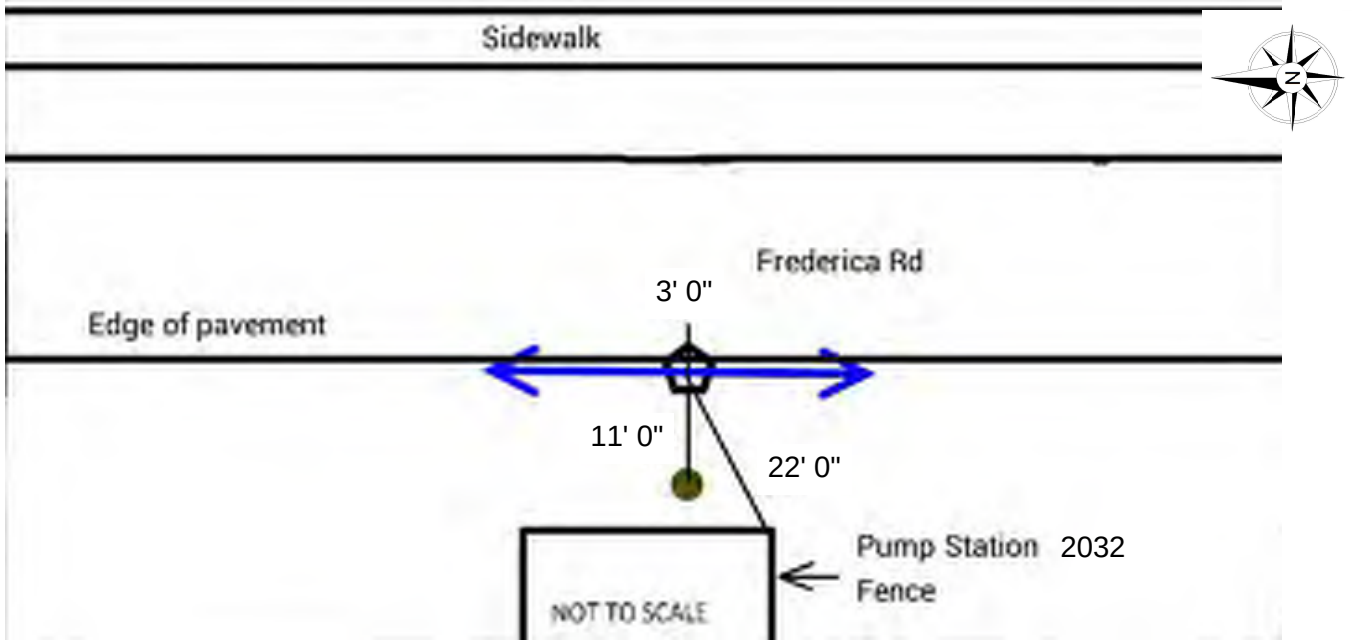
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 8
General Location: Fredrica Rd Date: 8-18-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Water Size: 12" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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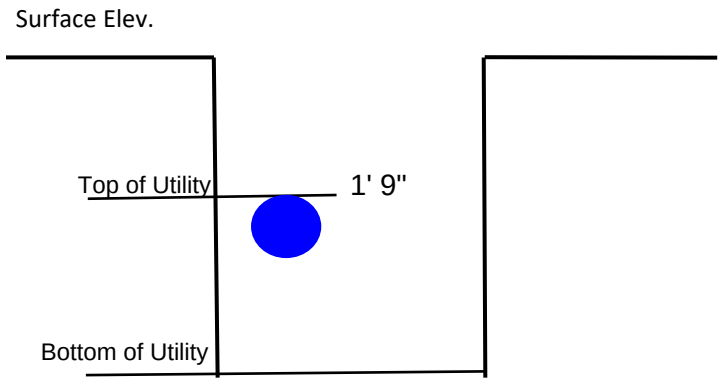

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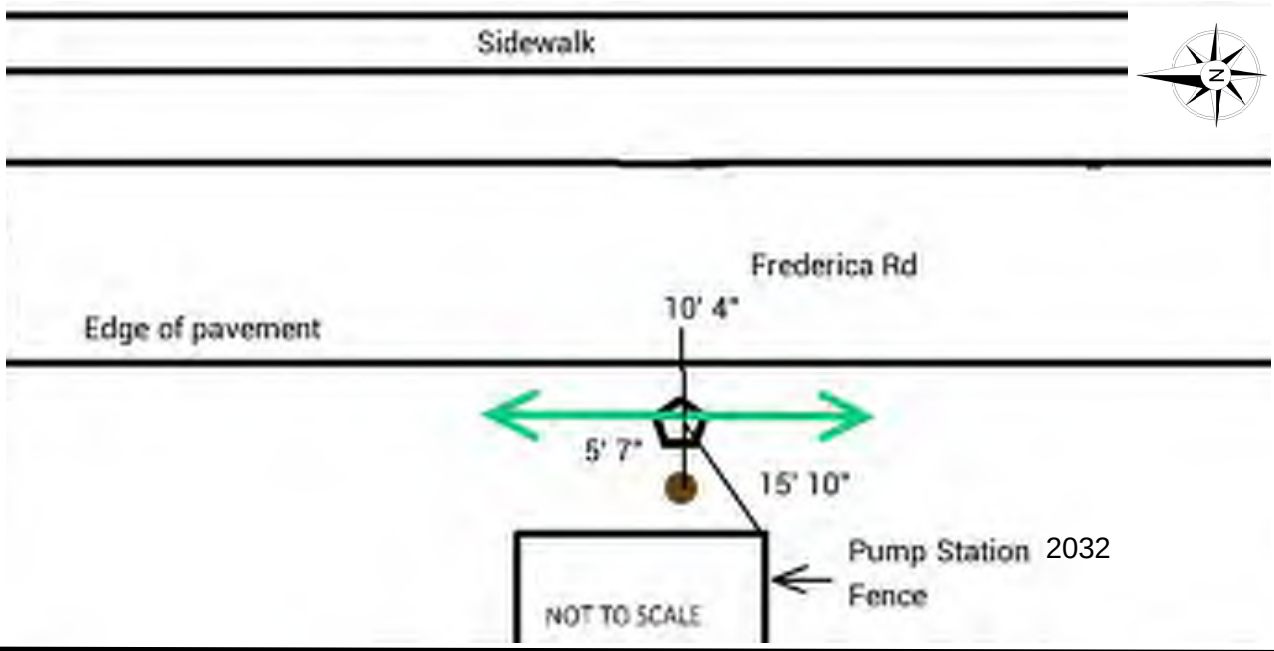
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 9
General Location: Fredrica Road Date:
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Sewer Size: 10" Material: Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



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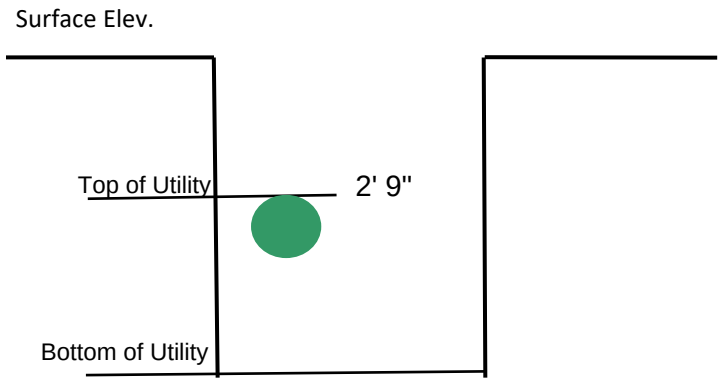
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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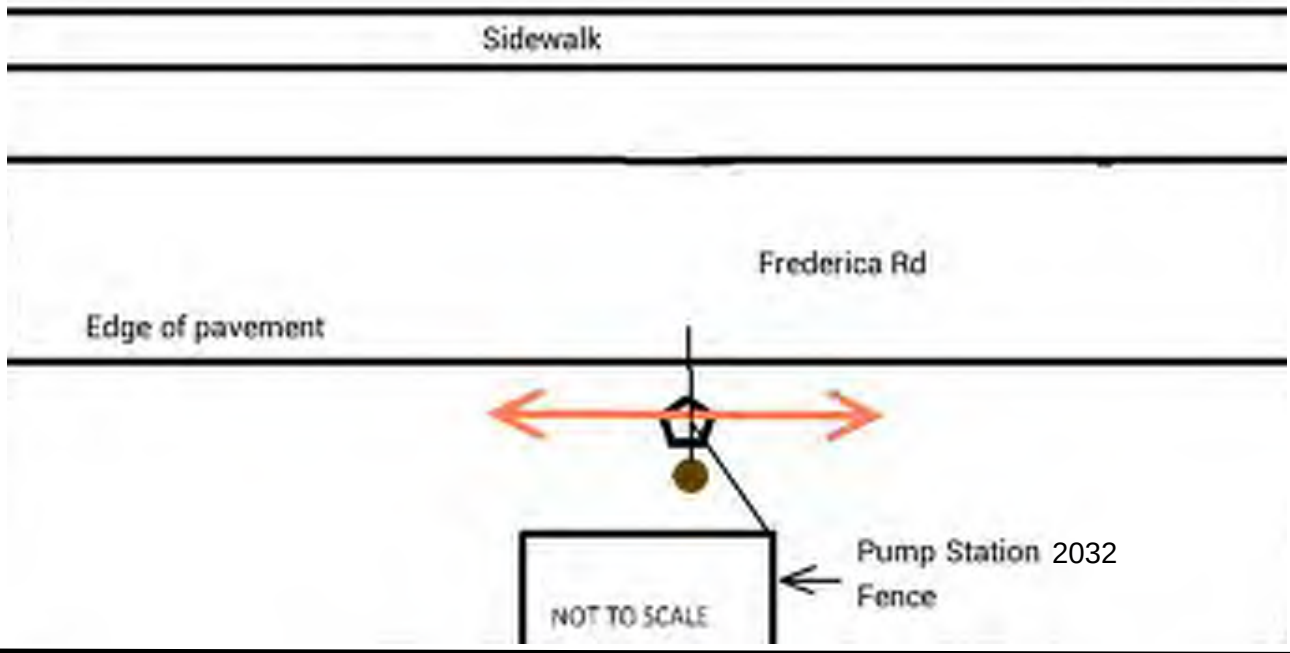
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 10
General Location: Fredrica Road Date: 8-18-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes: High water table. unable to get a good photo.
Utility: Telecom Size: 1.5" Material: Fiber Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
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FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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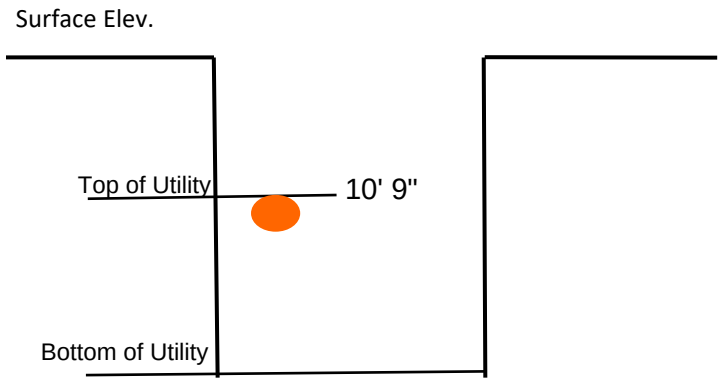
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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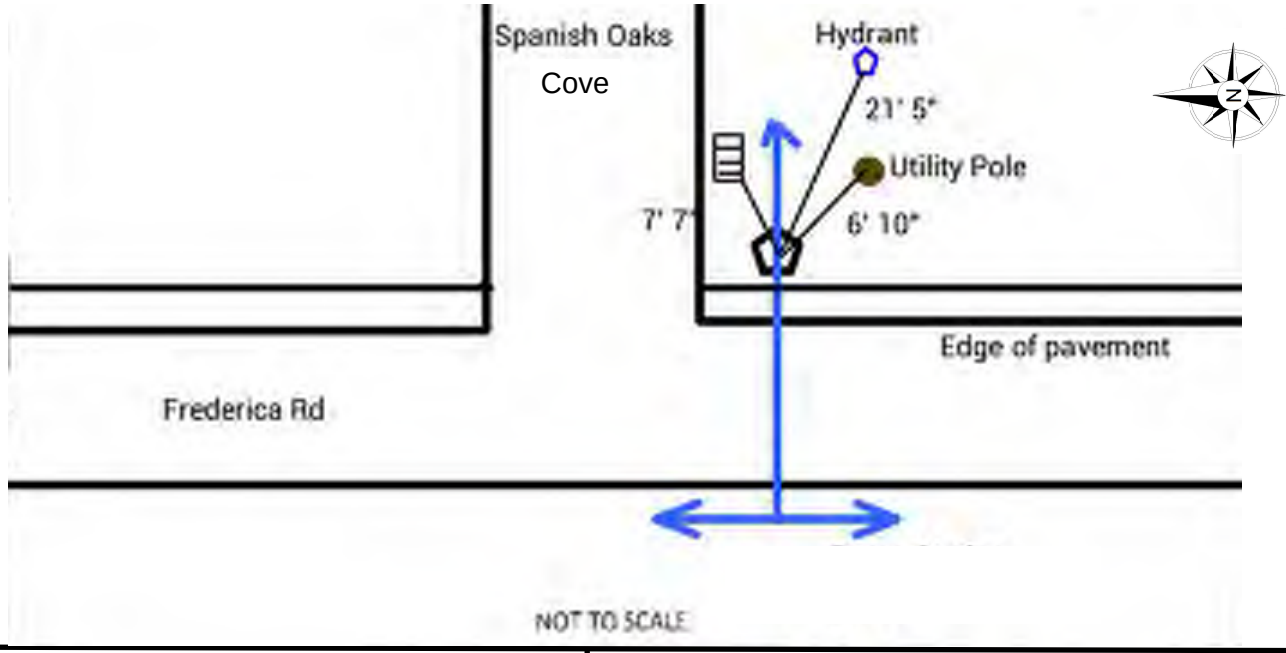
Quality Level-A Utility Test Hole Report

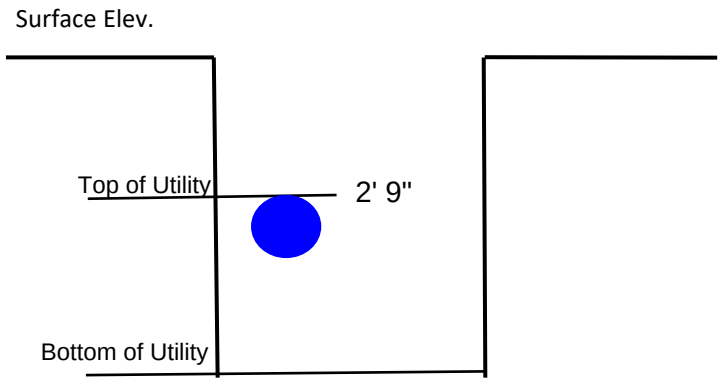
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 11
General Location: Fredrica Road & Spanish Oaks Cove Date: 8-18-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Baron
Notes:
Utility: Water Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

Field Sketch Area

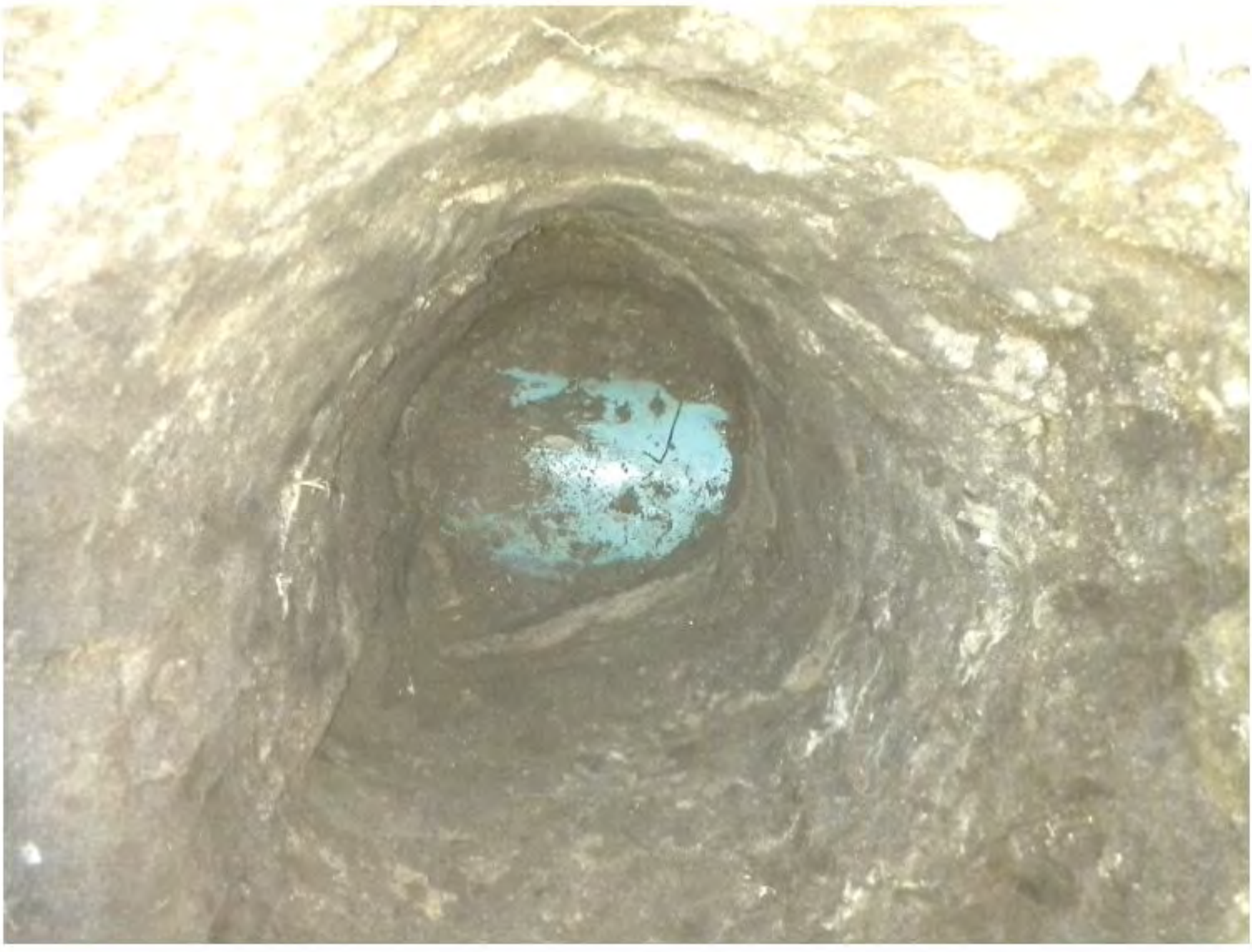


Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




RHD



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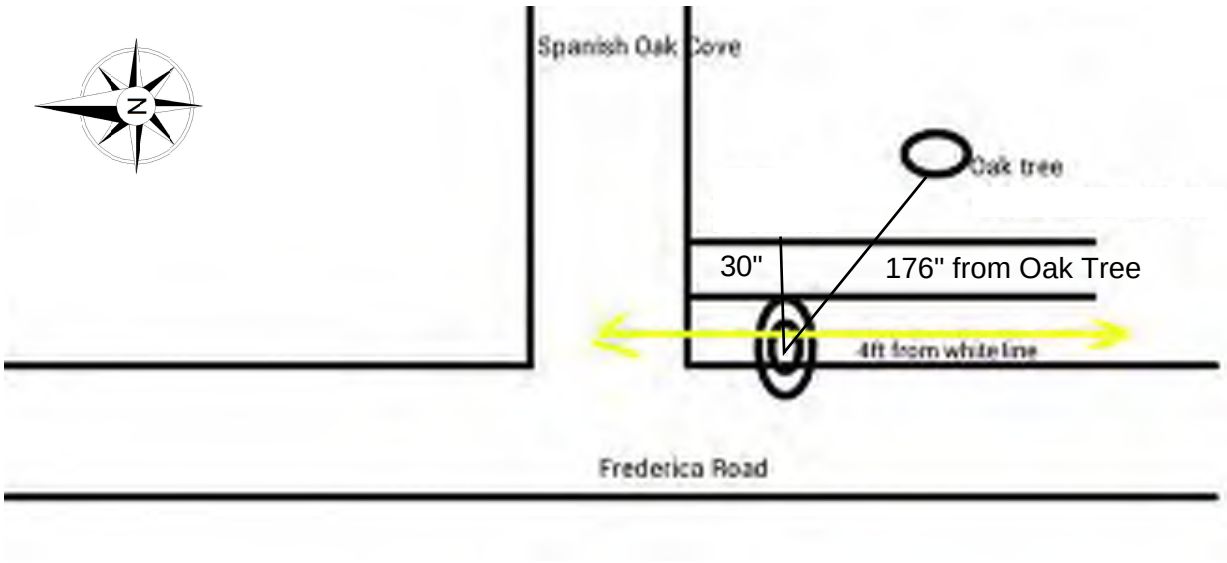
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 12
General Location: Fredrica Road & Spanish Oak cove Date: 8-22-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Gas Size: 4" Material: Steel Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

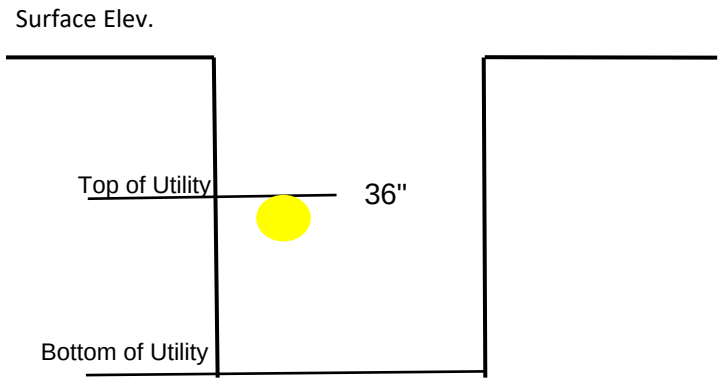
Field Sketch Area



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




176"
30"

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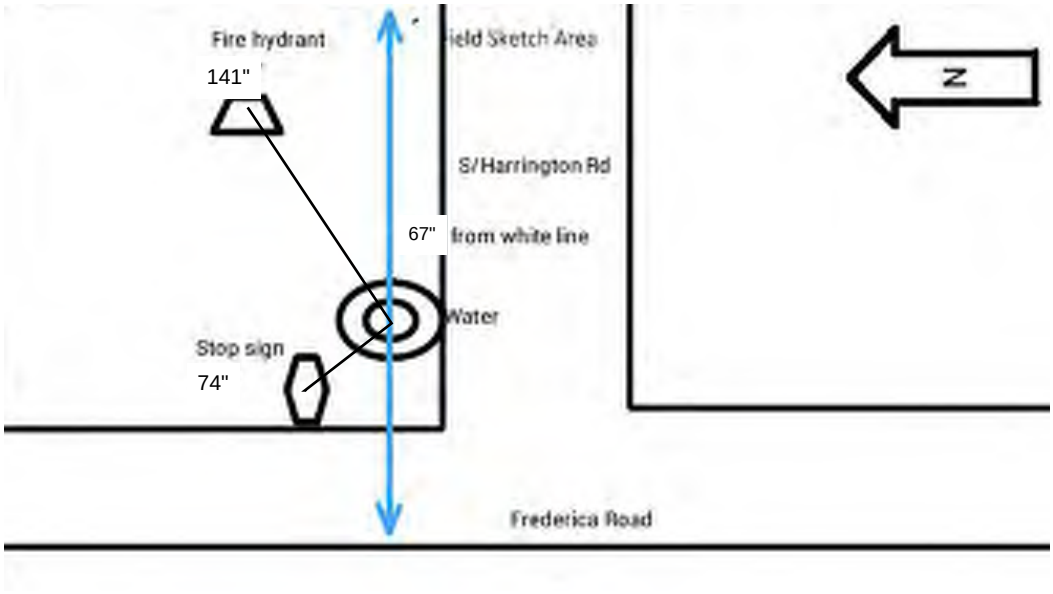
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 13
General Location: Fredrica Road & S Harrington Road Date: 8-22-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Water Size: 12" Material: A/C Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Gray Sand Field Condition: Good

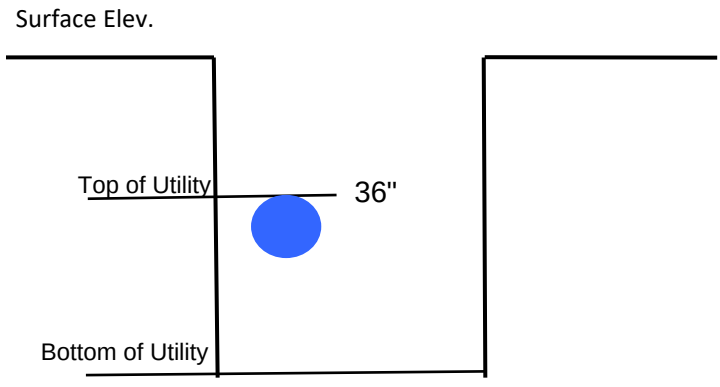
Field Sketch Area



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




STOP


S Harrington Rd

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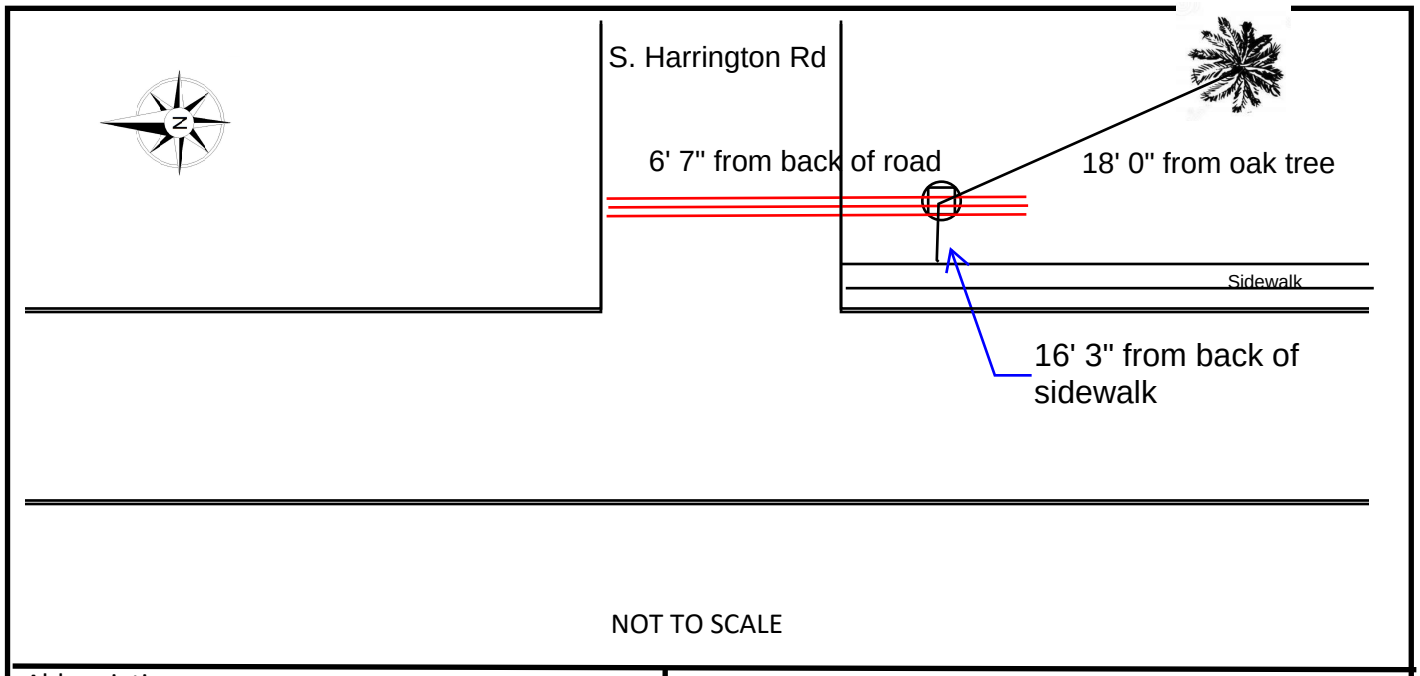
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 14
General Location: Fredrica Road & S. Harrinton Road Date: 8-22-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Telecom Size: Conduits Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

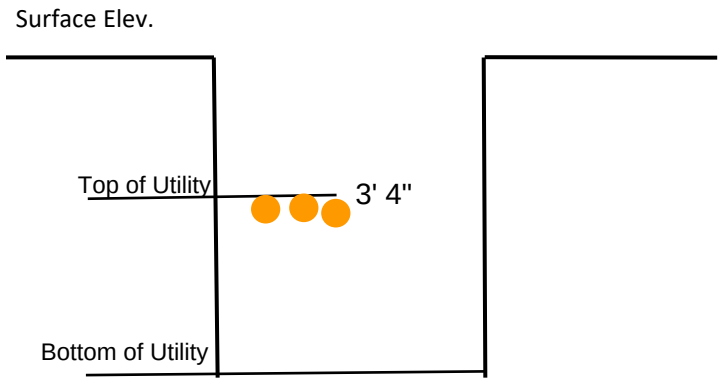
Field Sketch Area



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




STOP

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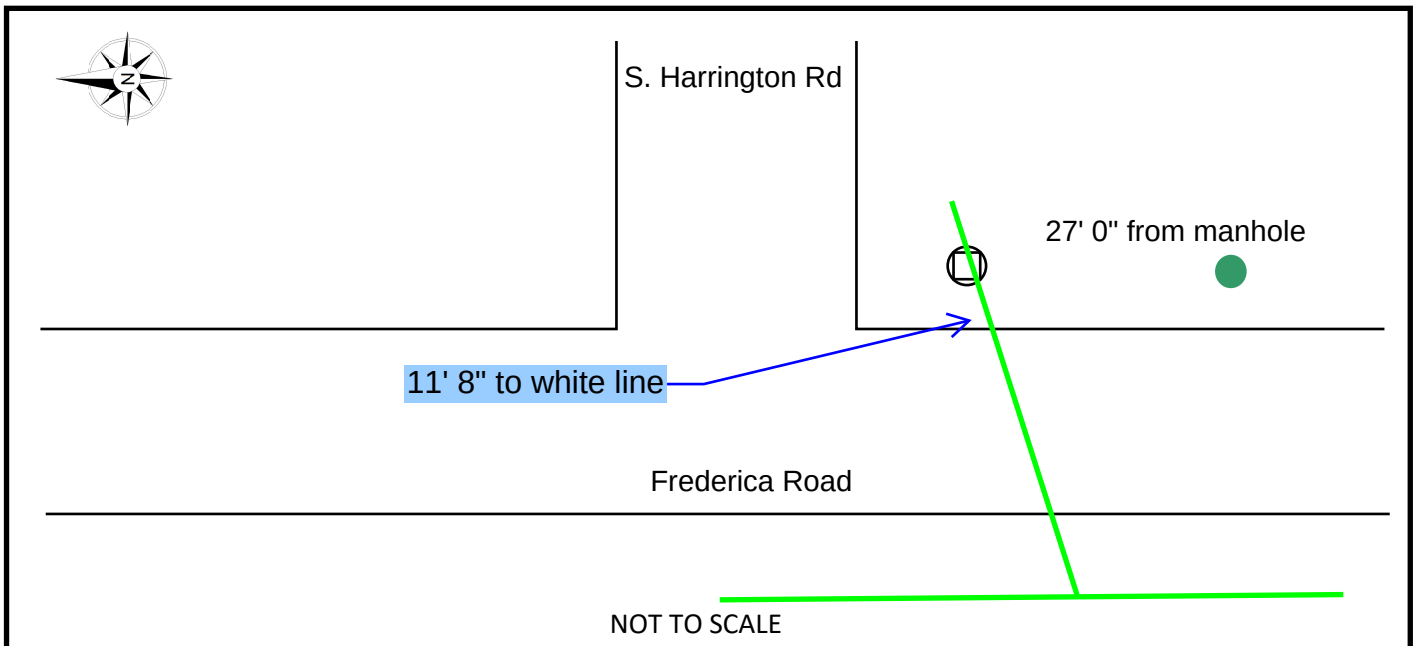
Quality Level-A Utility Test Hole Report

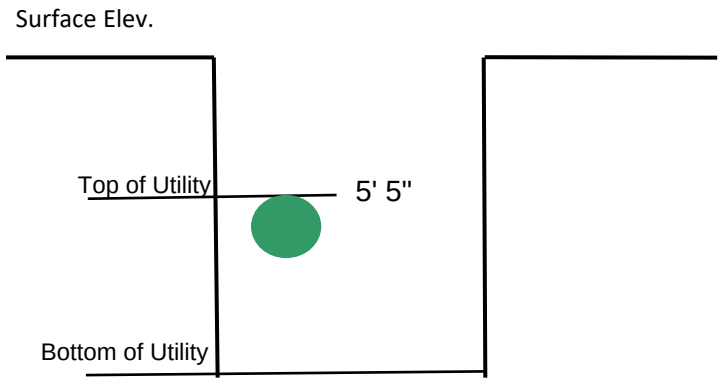
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 15
General Location: Fredrica Road and S. Harrington Road Date: 8-22-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Sanitary Size: 10" Material: A/C Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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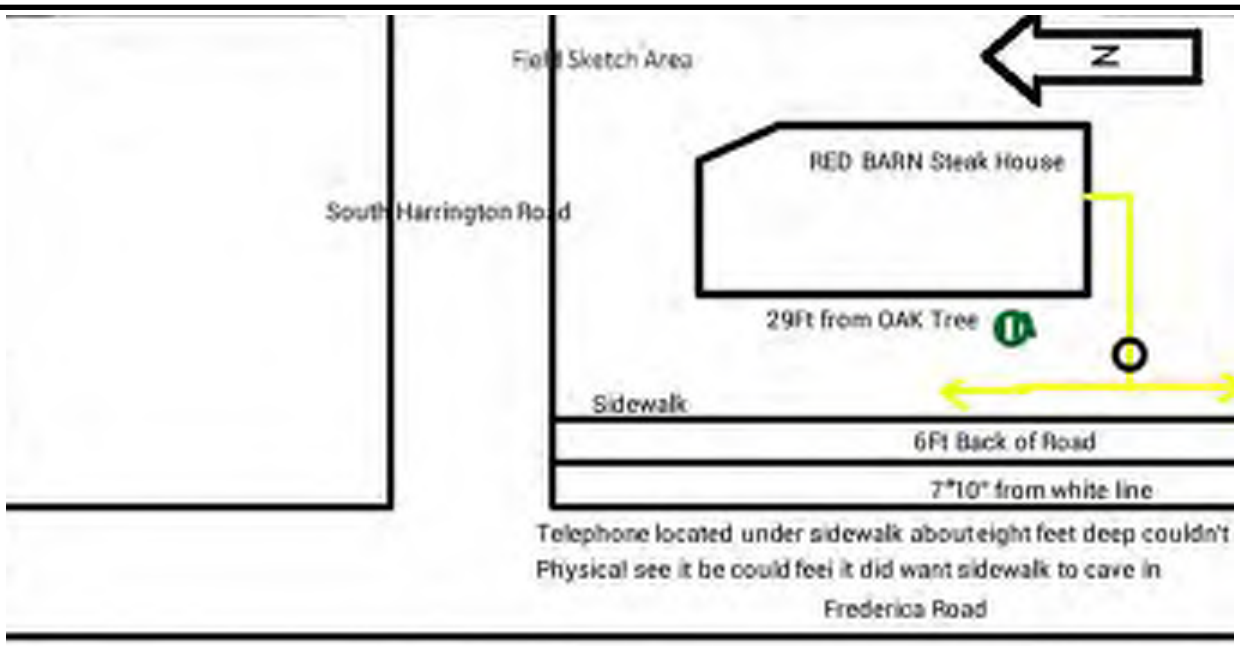
Quality Level-A Utility Test Hole Report

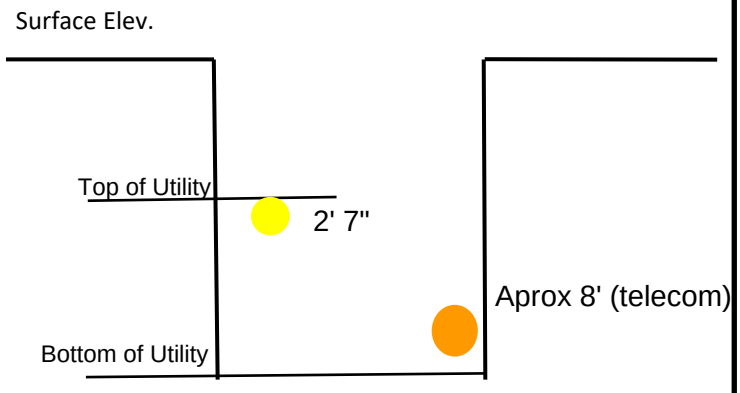
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 16
General Location: Fredrica Road and S. Harrington Road Date: 8-22-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Gas/Telecom Size: 2" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




BARN

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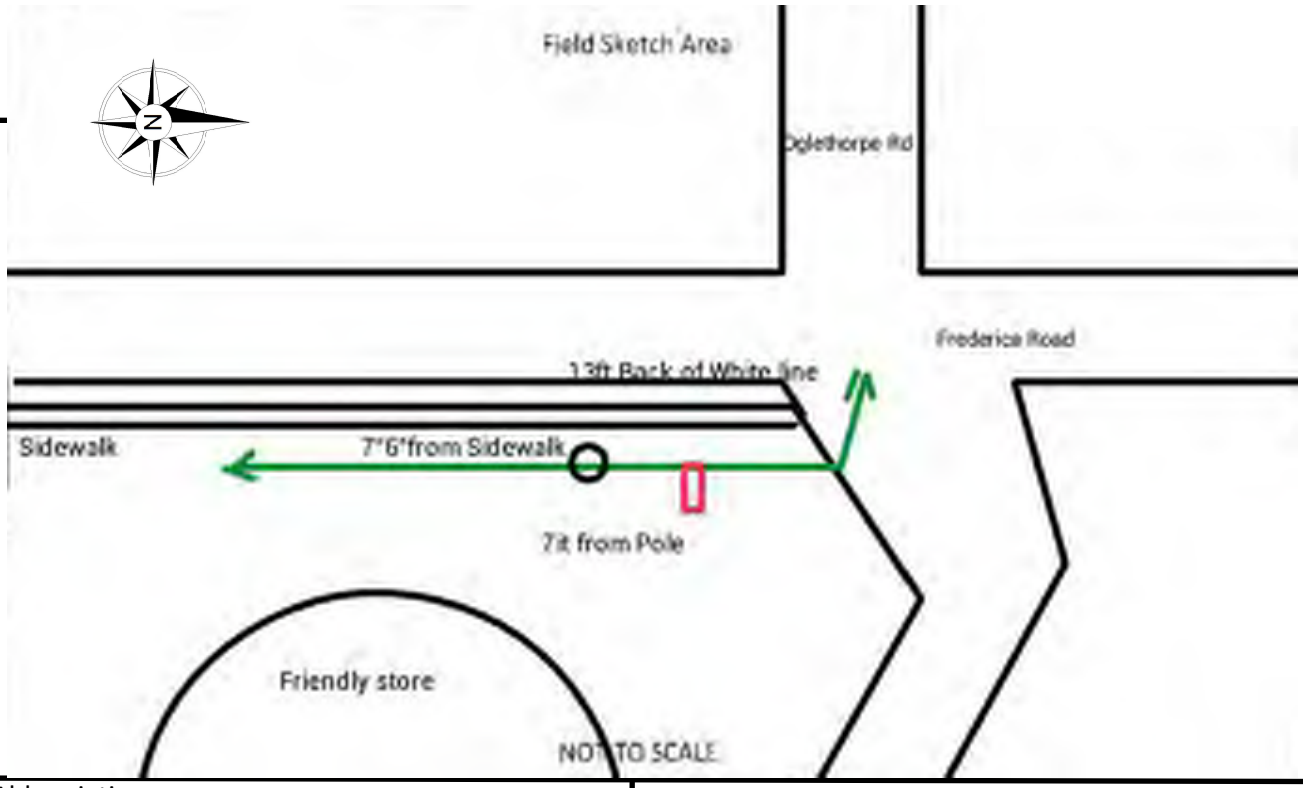
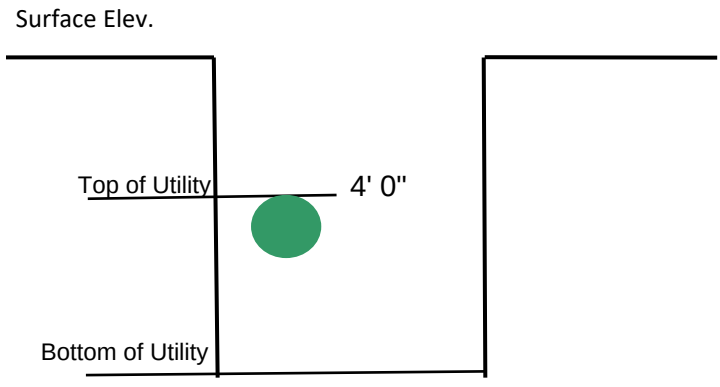
Quality Level-A Utility Test Hole Report

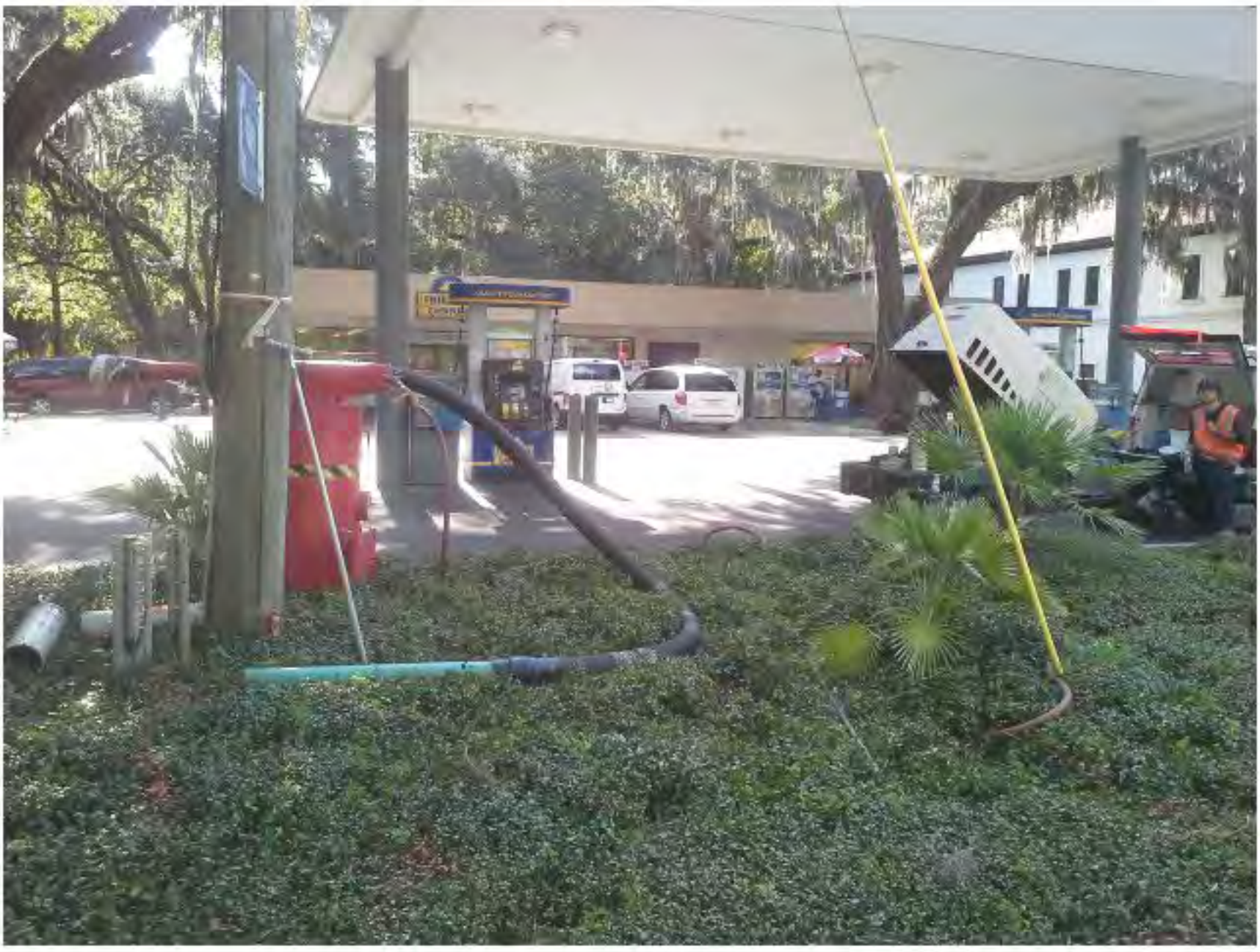
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 17
General Location: Fredrica Road and Oglethorpe Road Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Sanitary Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole






ASTAL
ENERY

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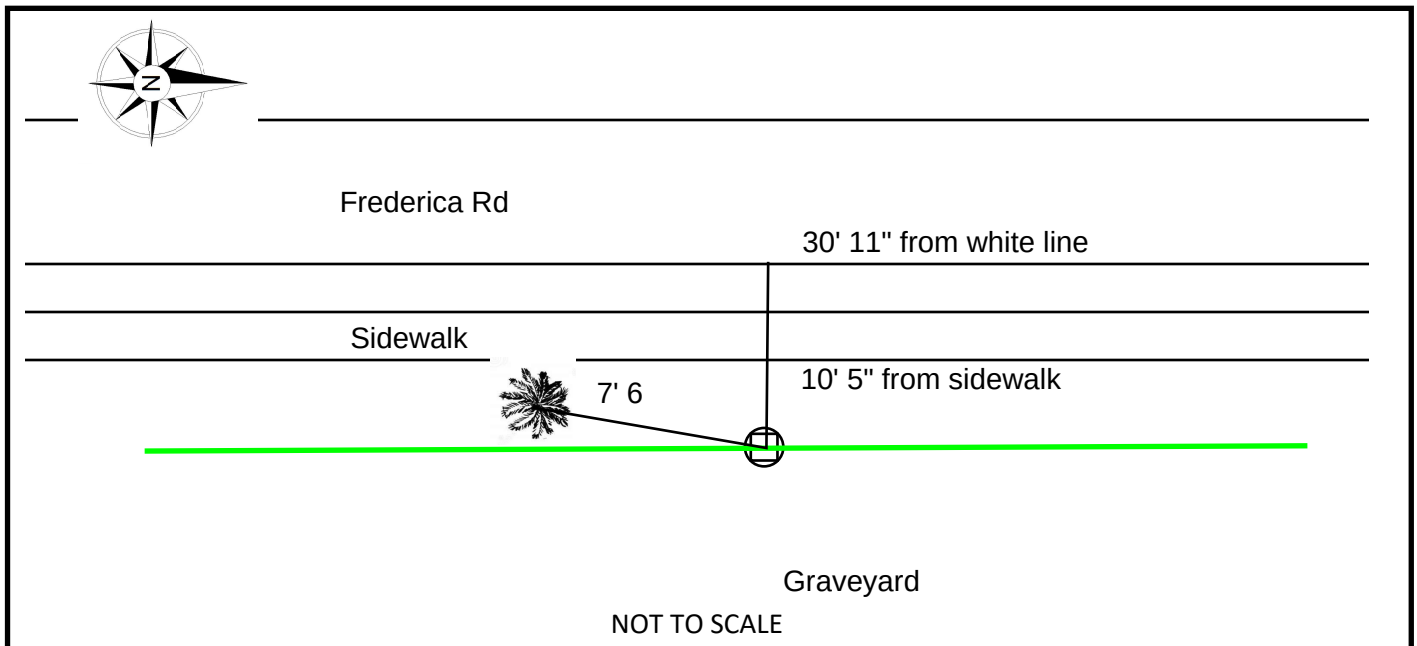
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 18
General Location: Fredrica Road in front of the cemetery Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Sanitary Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
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PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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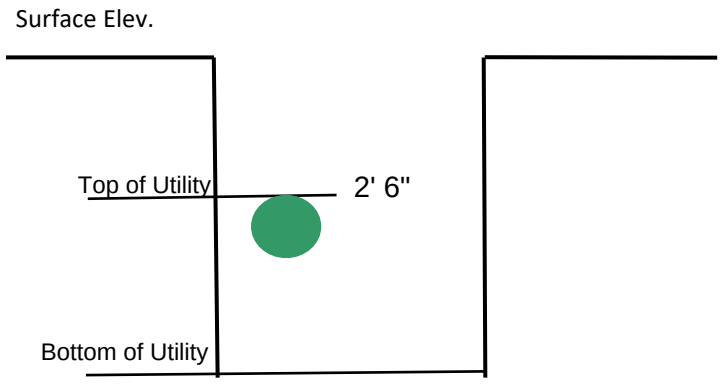
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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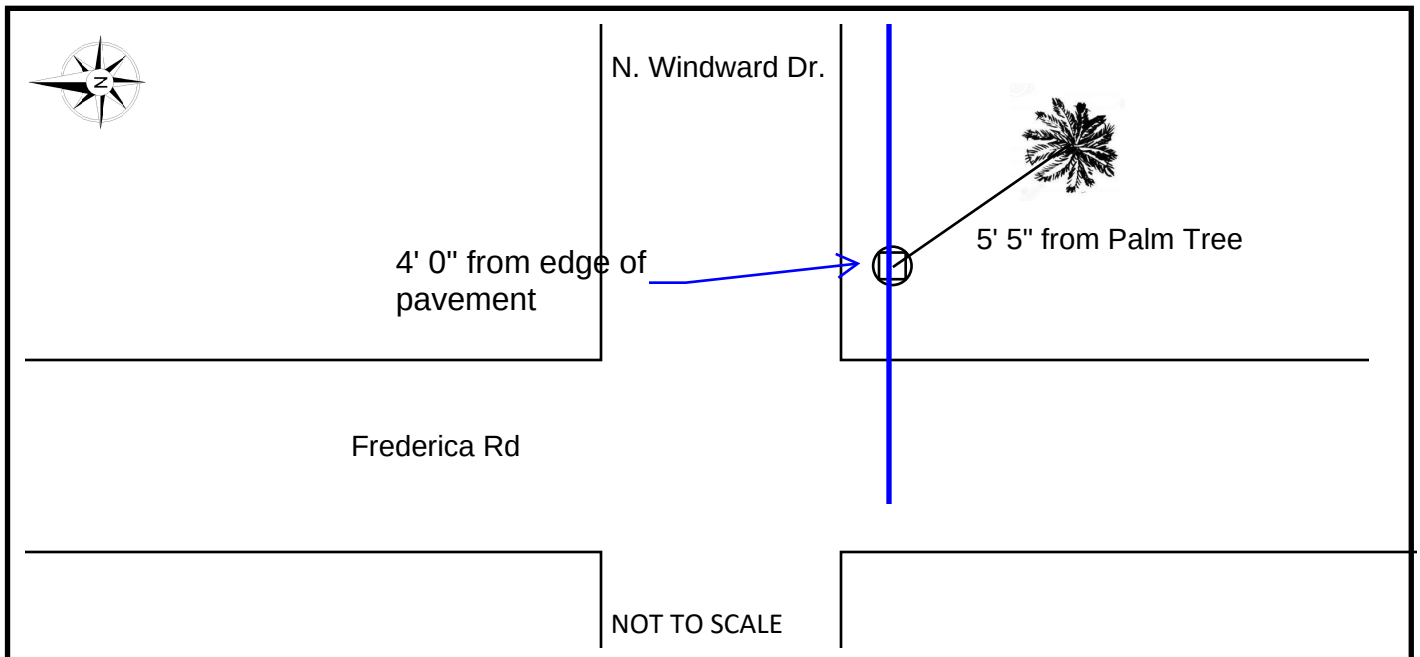
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 19
General Location: Fredrica Road and N. Windward Dr Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Water Size: 8" Material: A/C Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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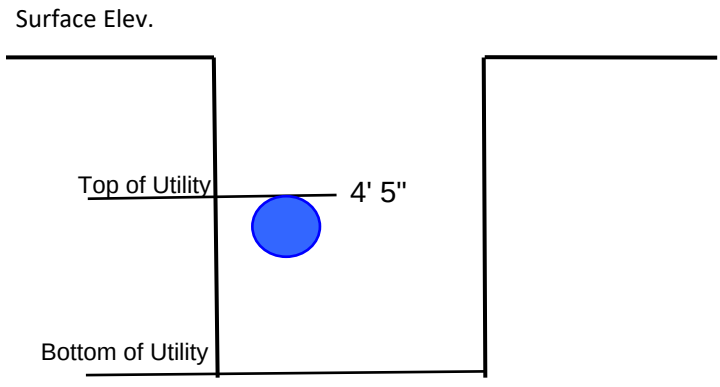
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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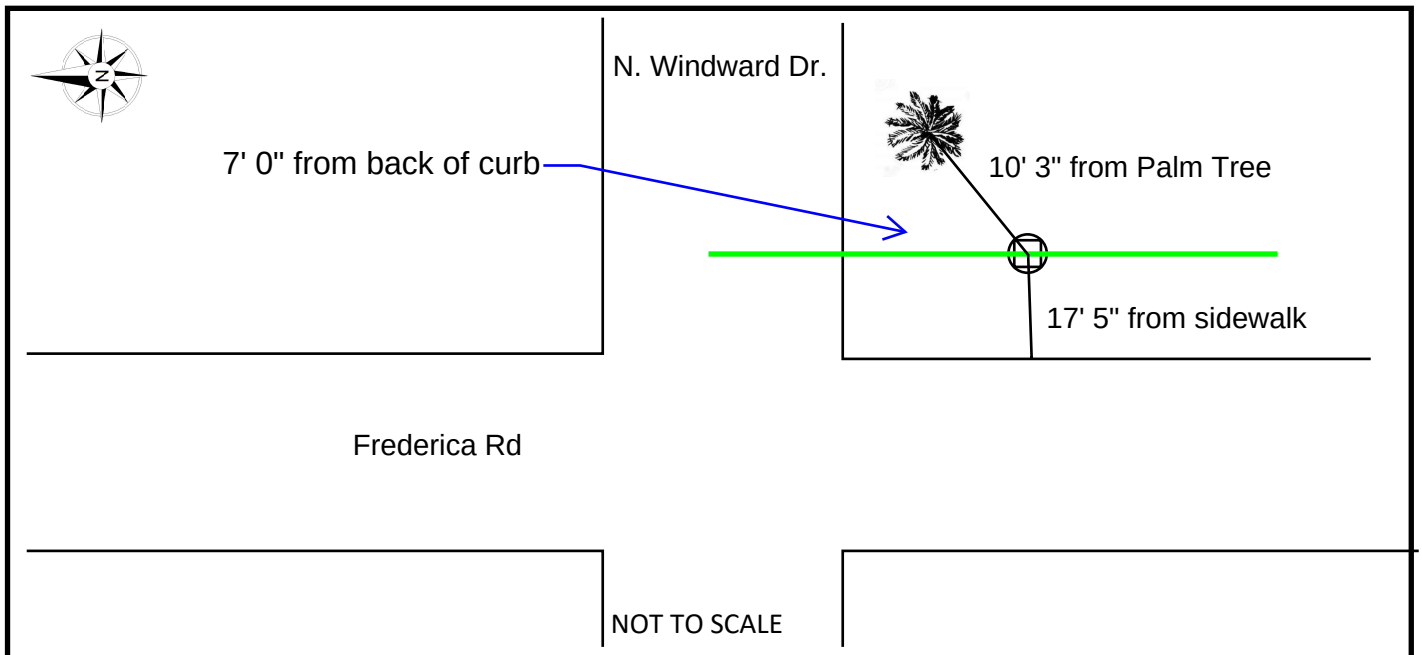
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 20
General Location: Fredrica Road and N. Windward Dr. Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Sanitary Size: 8" Material: Plastic Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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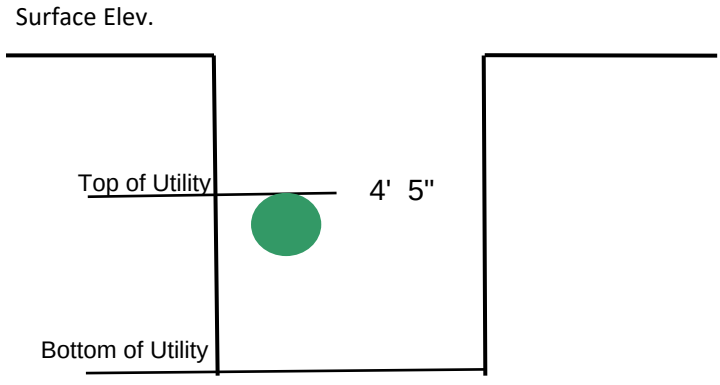
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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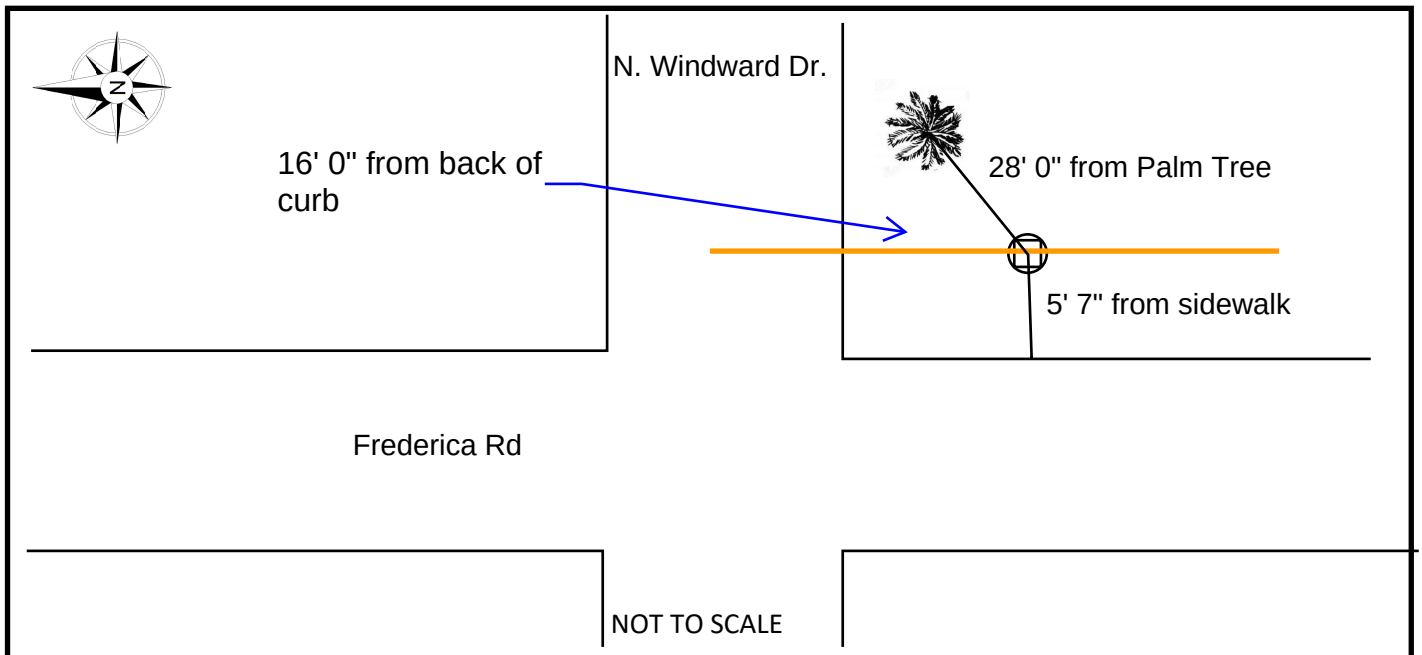
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 21
General Location: Fredrica Road and N. Windward Dr. Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Telecom Size: 2" cable Material: Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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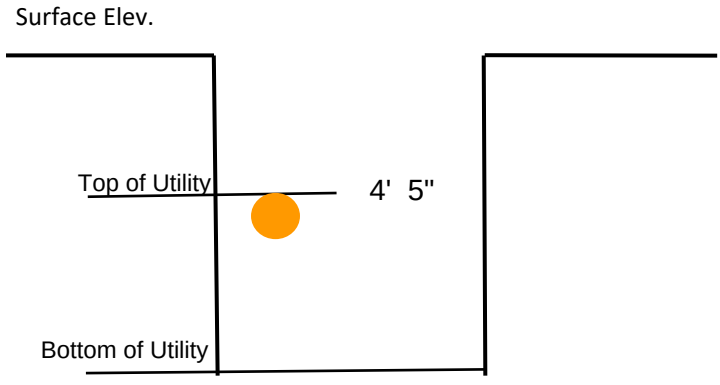
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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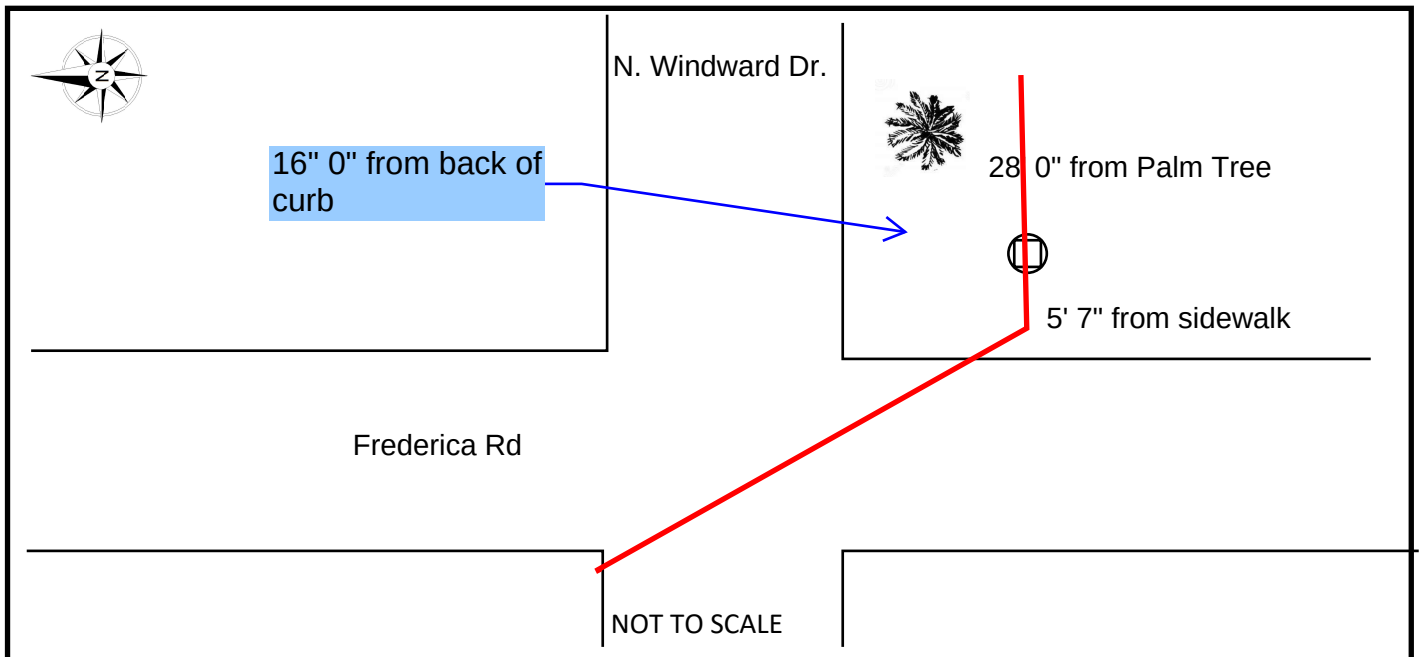
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 22
General Location: Fredrica Road and N. Windward Dr. Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: Unable to see the power line due to water table. We were able to probe down to the conduit.
Utility: Power Size: see notes Material: Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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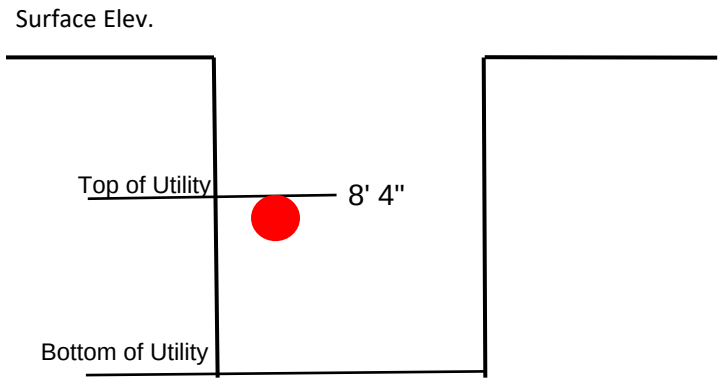
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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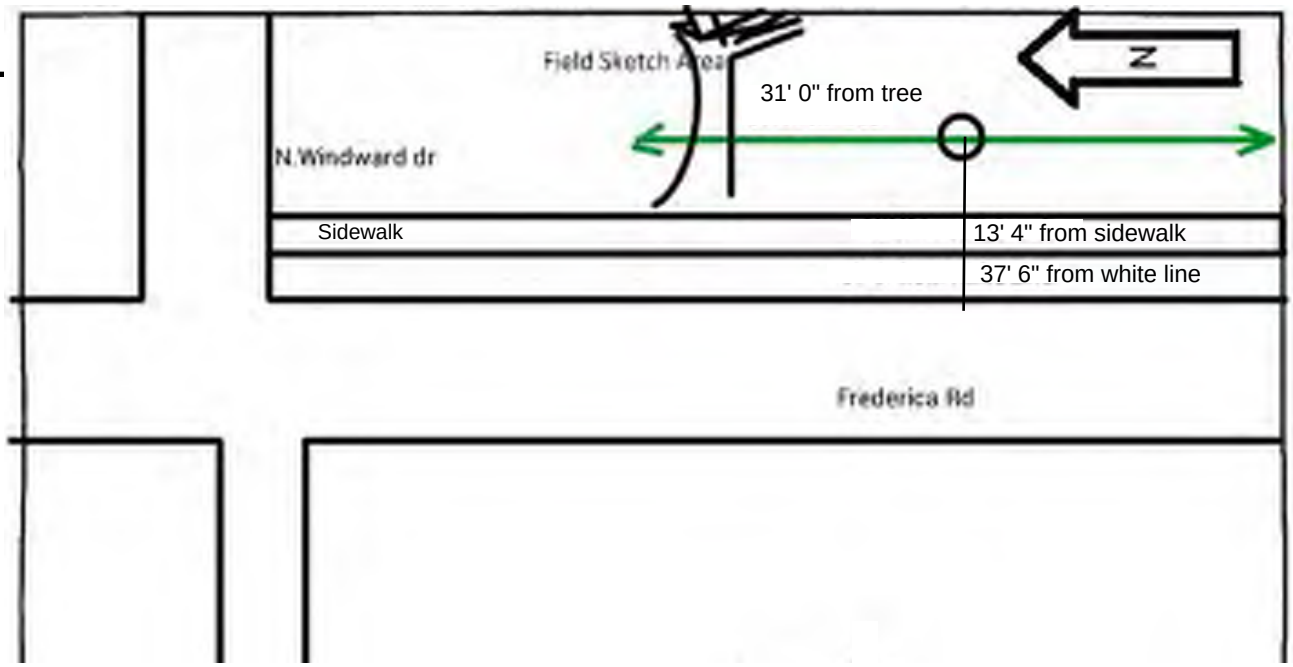
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 23
General Location: Fredrica Road across from 5417 Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Sanitary Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

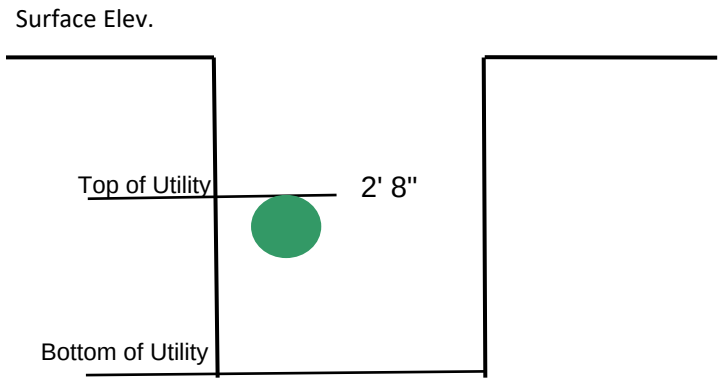
Field Sketch Area



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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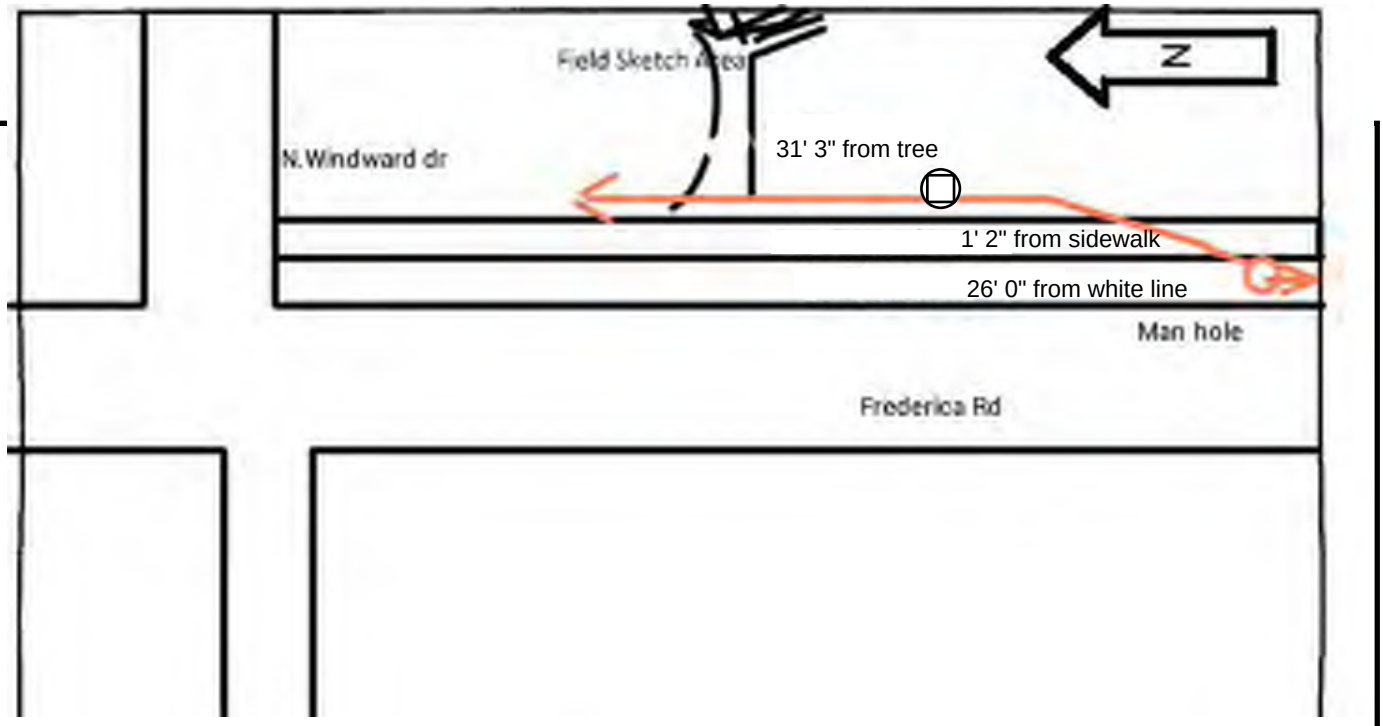
Quality Level-A Utility Test Hole Report

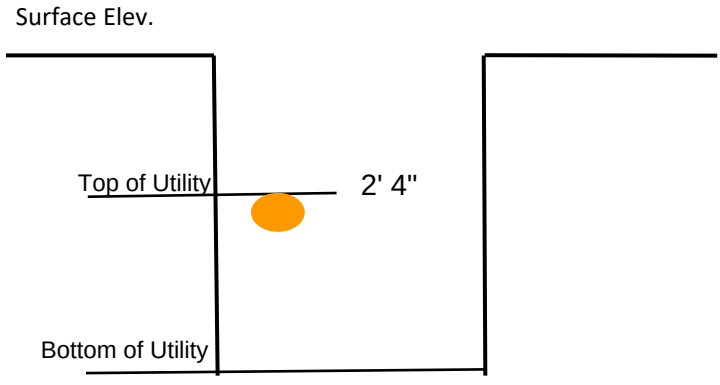
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 24
General Location: Fredrica Road across from 5417 Date: 8-24-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Telecom Size: Material: Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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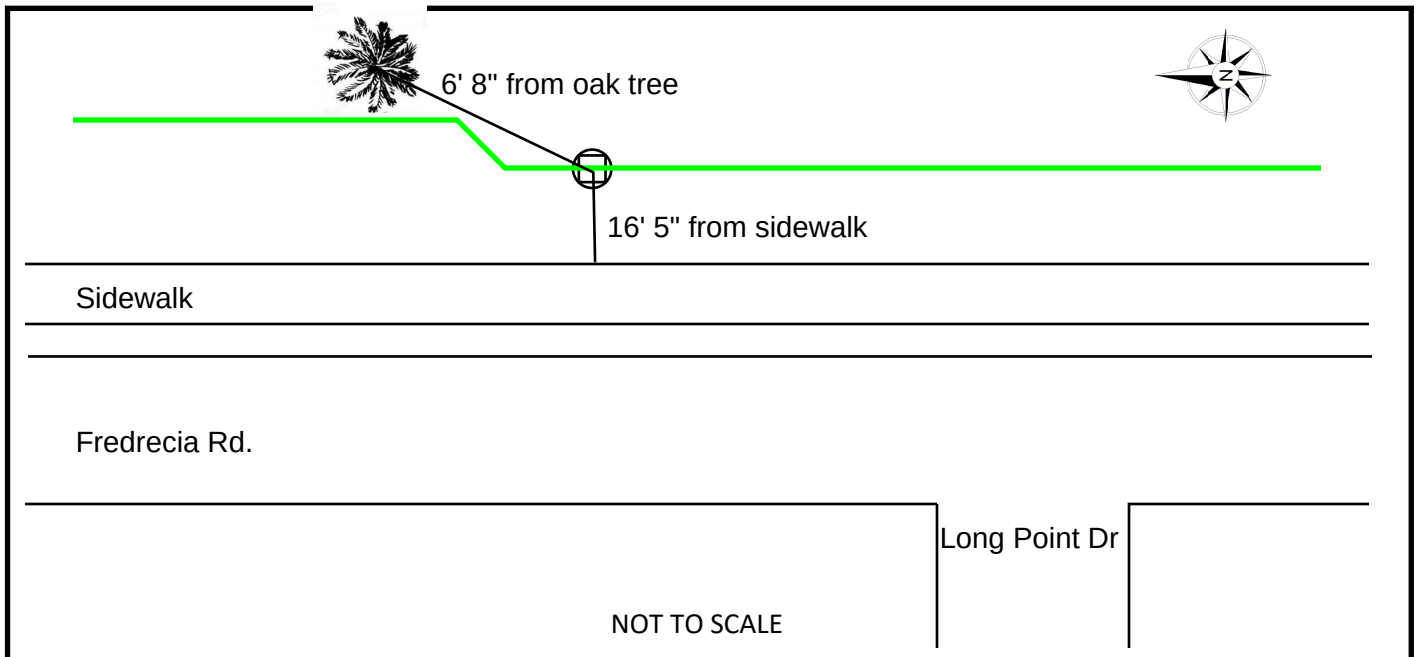
Quality Level-A Utility Test Hole Report

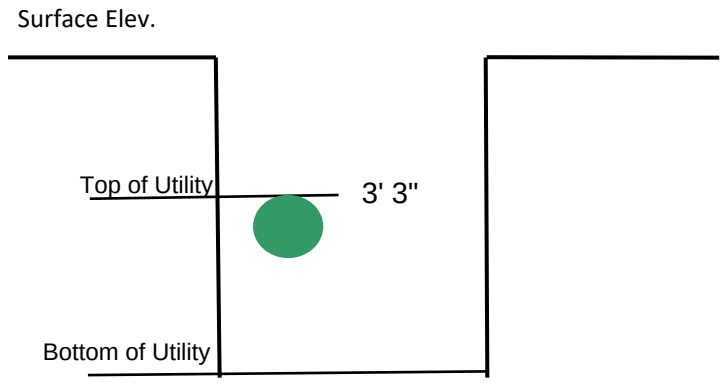
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 25
General Location: Fredrica Road and Long Point Drive Date: 8-22-16
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Sanitary Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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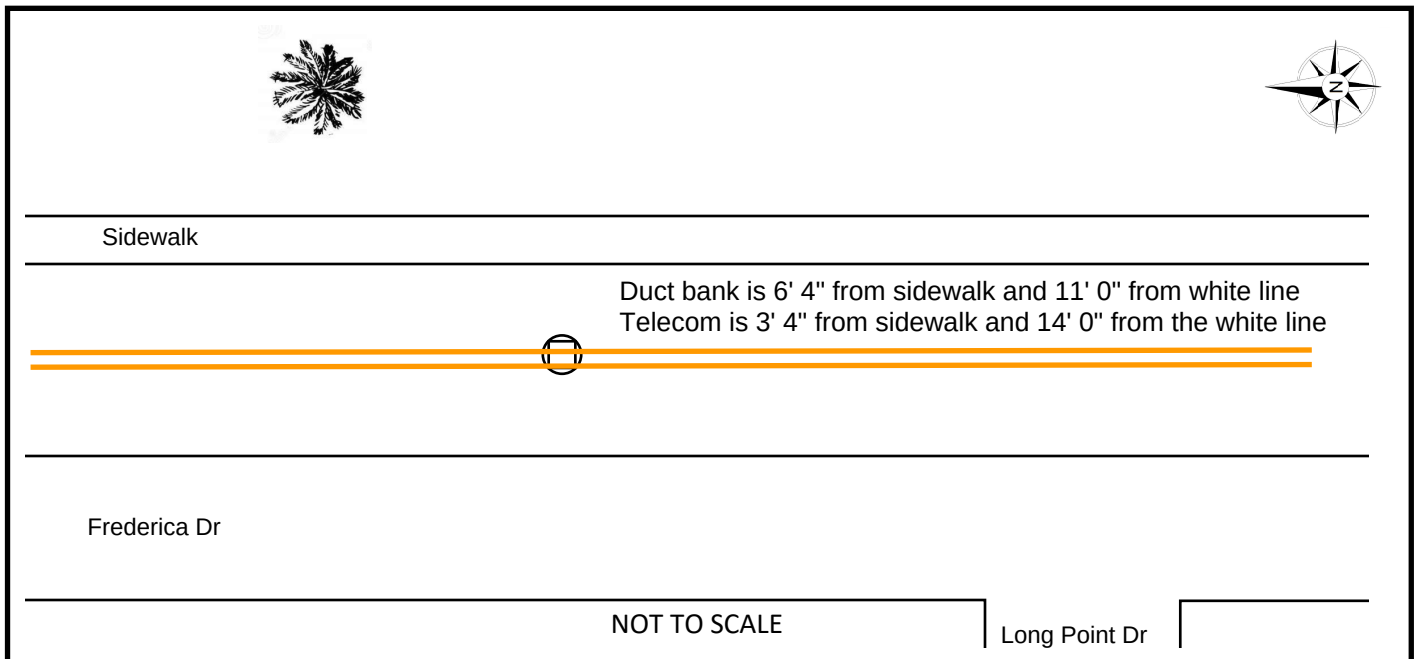
Quality Level-A Utility Test Hole Report

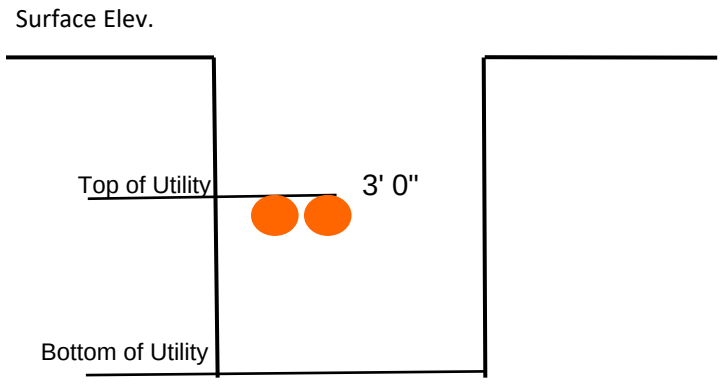
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 26
General Location: Fredrica Road and Long Point Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Fiber duct bank Size: Material: Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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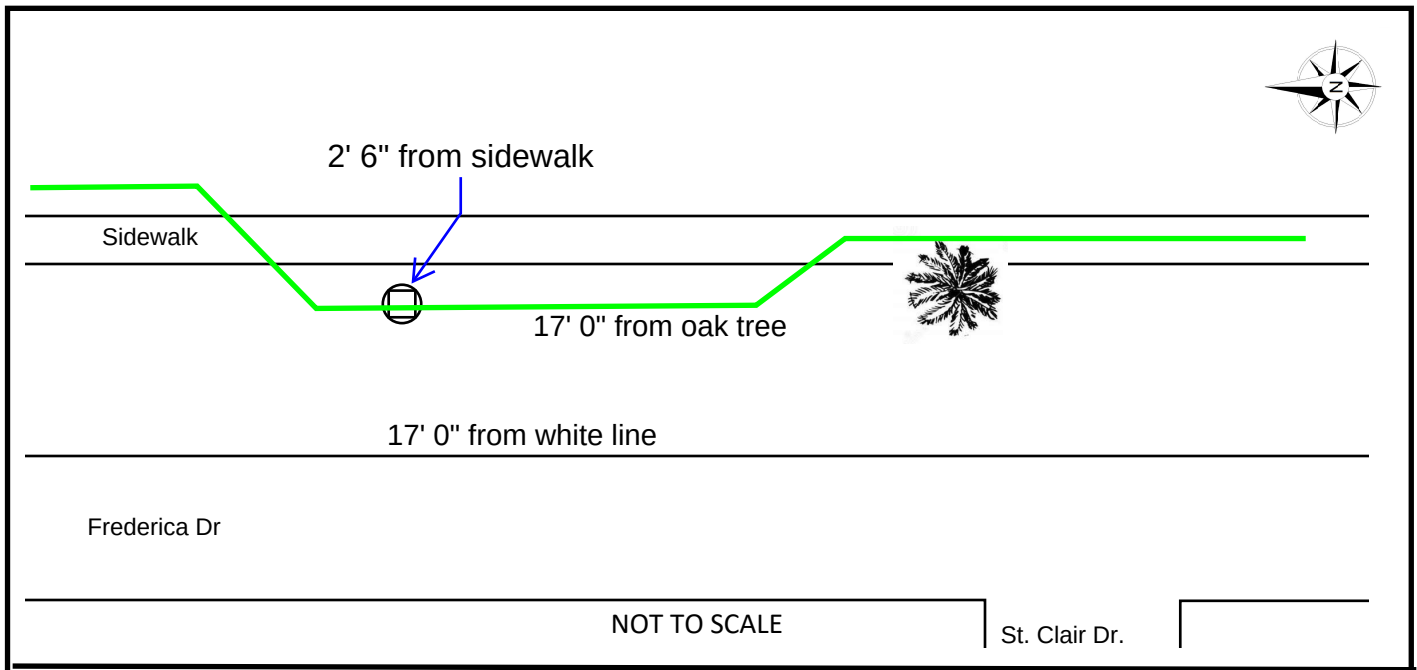
Quality Level-A Utility Test Hole Report

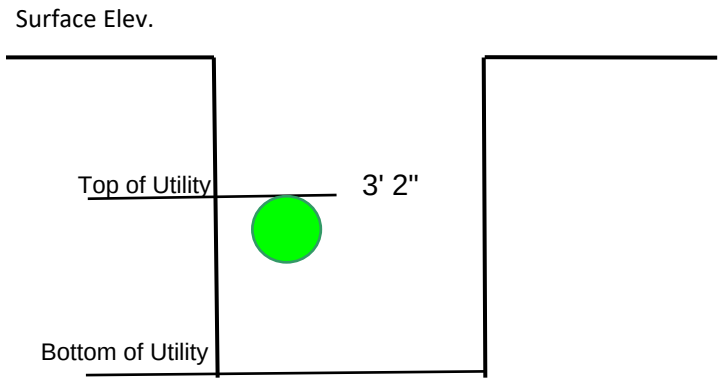
Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 27
General Location: Fredrica Road and Saint Clair Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Sanitary Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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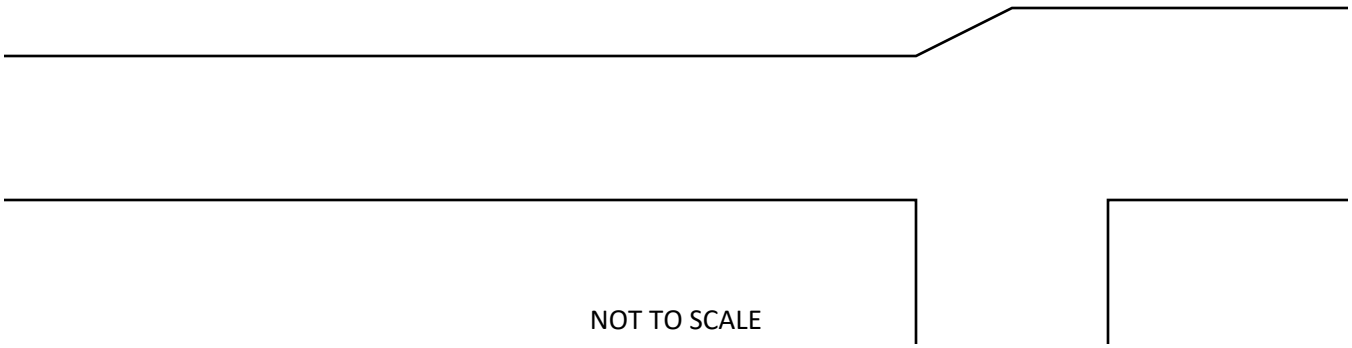
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 28
General Location: Fredrica Road and St. Clair Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Size: Material: Condition: Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Field Condition:

Field Sketch Area

#28 is not used.
No #28 Test Hole



NOT TO SCALE

Abbreviations:

BM – Benchmark
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CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
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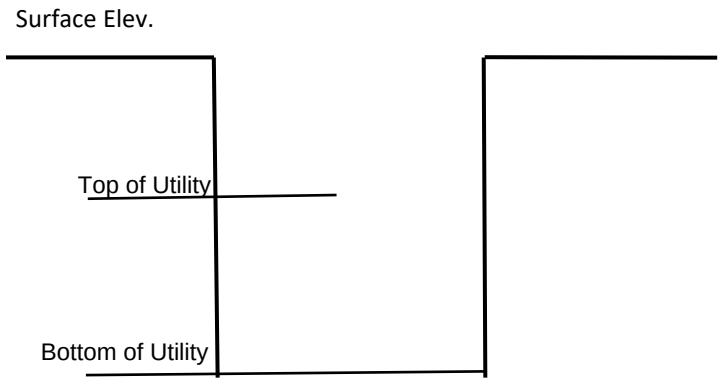
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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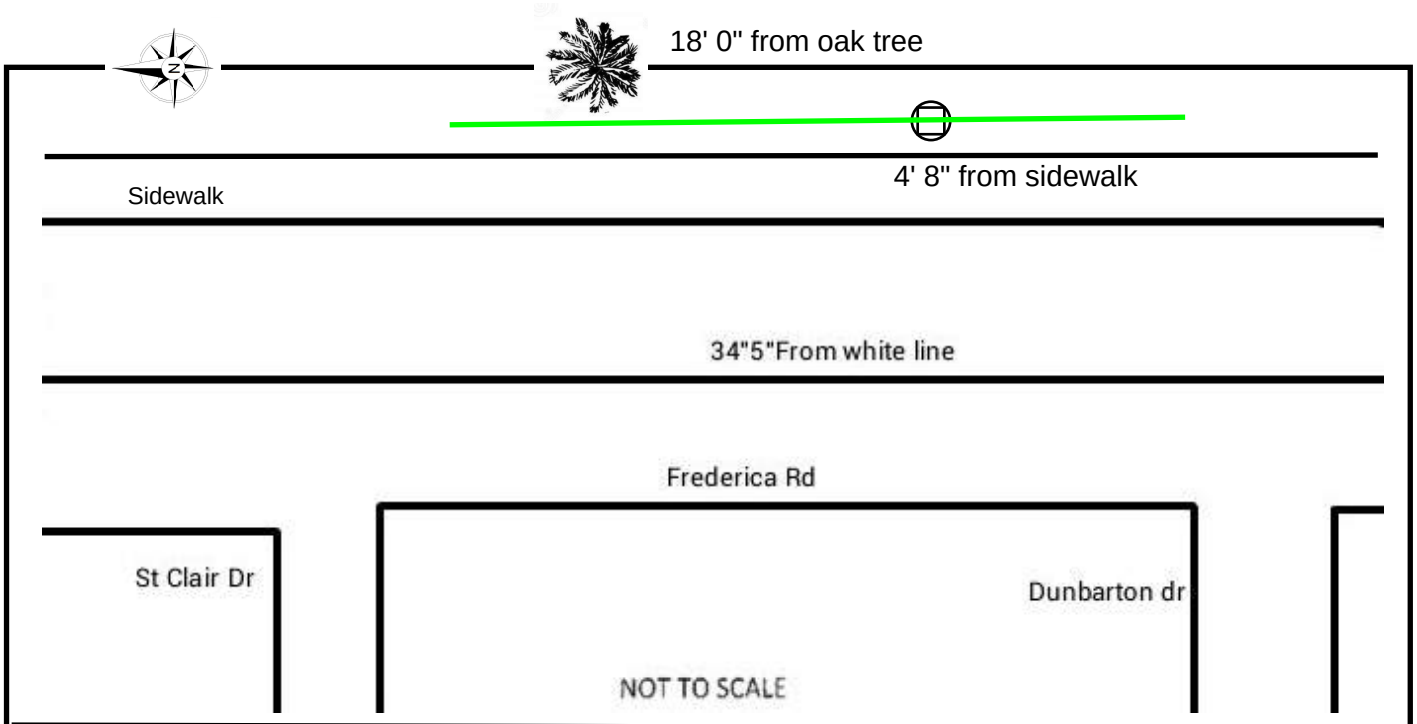
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 29
General Location: Between St. Clair Dr. and Dumbarton Dr. Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: FM Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: N/A Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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STL – Steel
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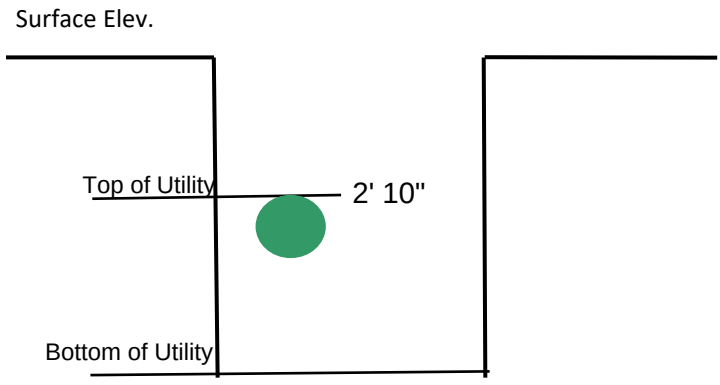
TC – Terra Cotta Pipe
UP – Utility Pole



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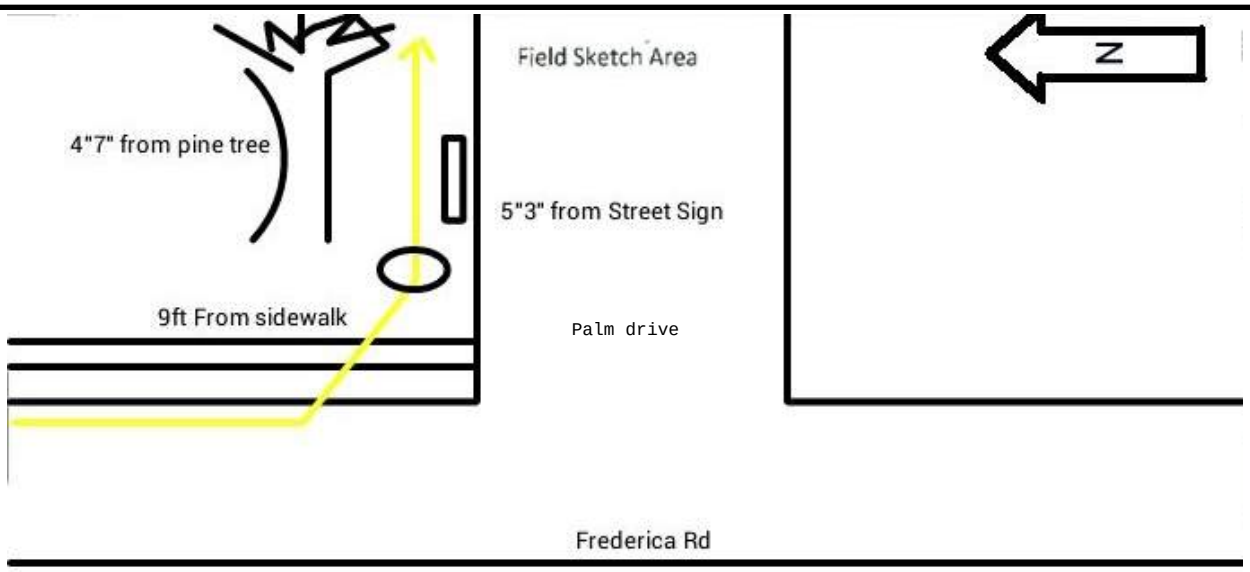
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 30
General Location: Fredrica Road and Palm Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Gas Size: 4" Material: Steel Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

BM – Benchmark
CB – Catch Basin
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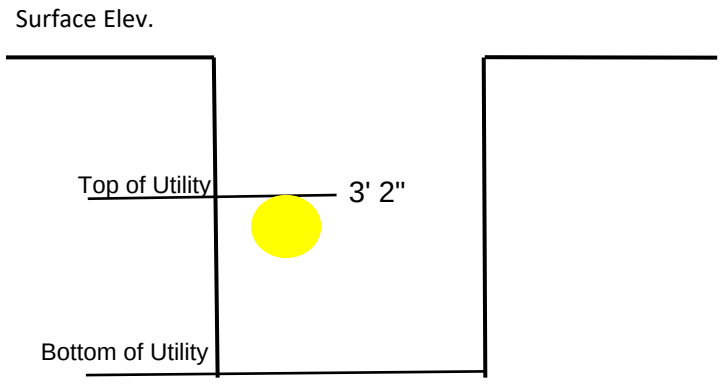
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




SEA PINES


SEAPALMS

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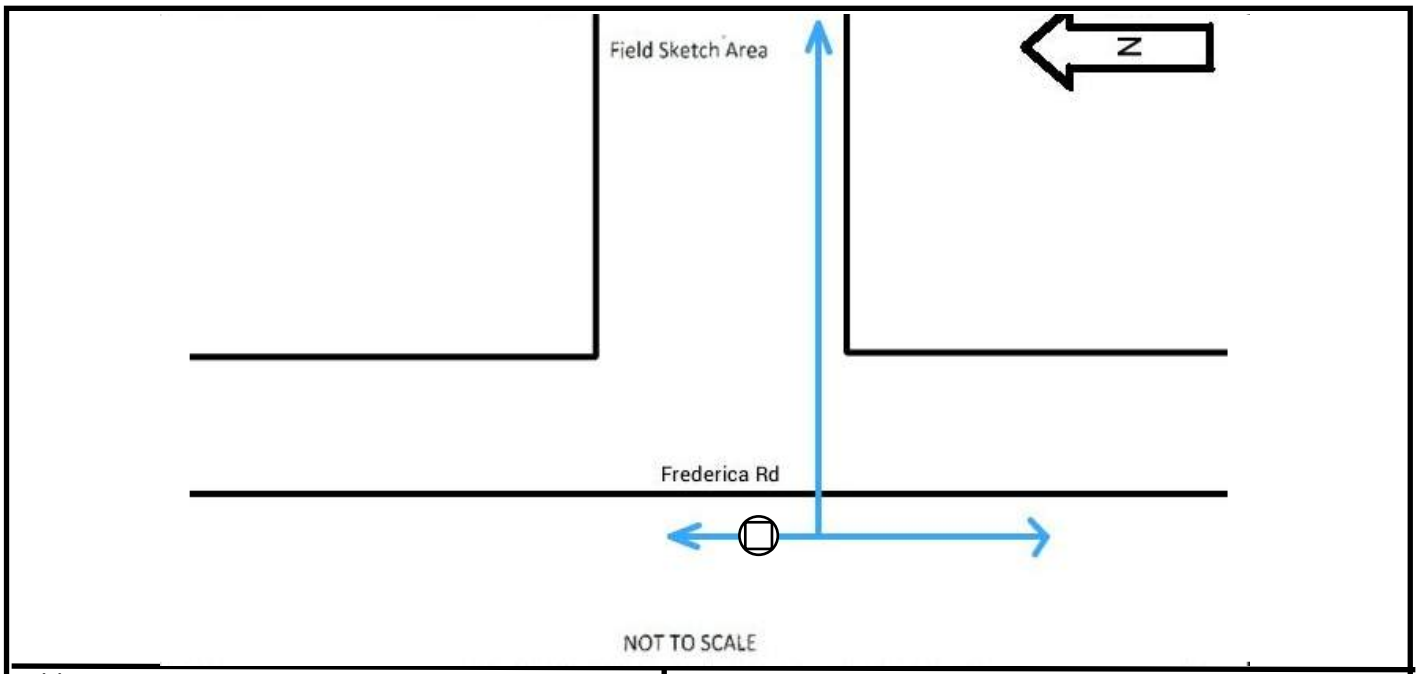
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 31
General Location: Fredrica Road and Palm Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: Located under pavement. Depth provided by GPR
Utility: Size: Material: Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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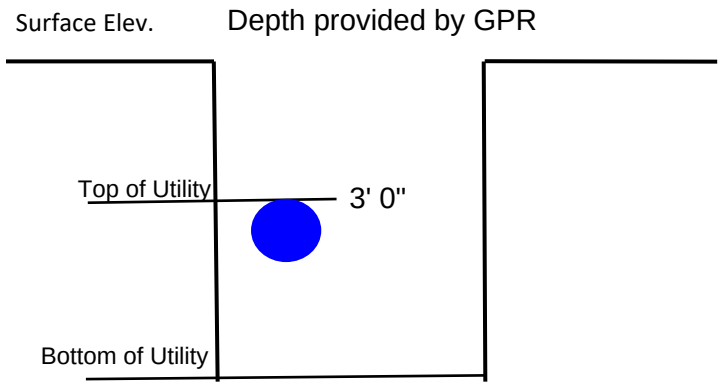
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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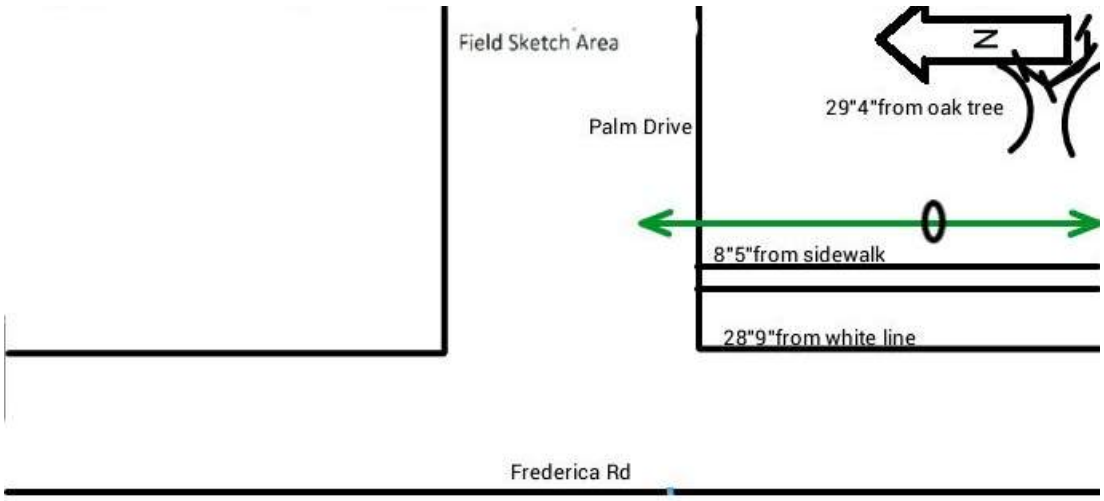
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 32
General Location: Fredrica Road Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: FM Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

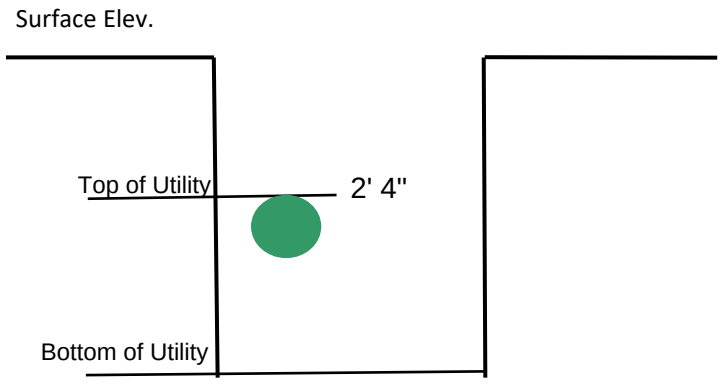
Field Sketch Area



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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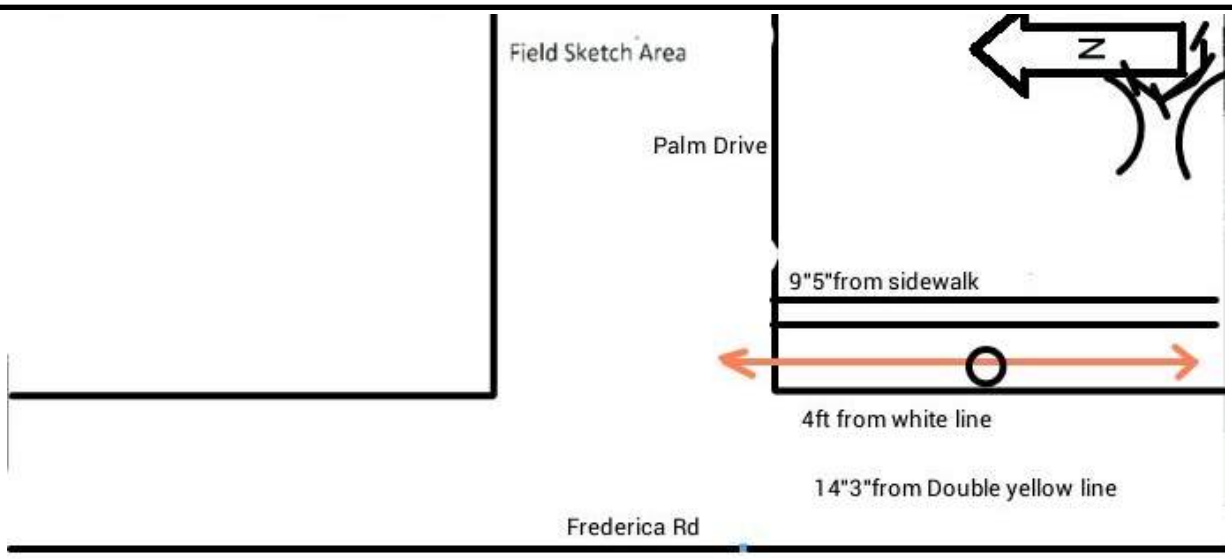
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 33
General Location: Fredrica Road and Palm Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Telecom Size: Aprox 2" Material: Cable Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



NOT TO SCALE

Abbreviations:

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CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
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PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
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ROW – Right of Way
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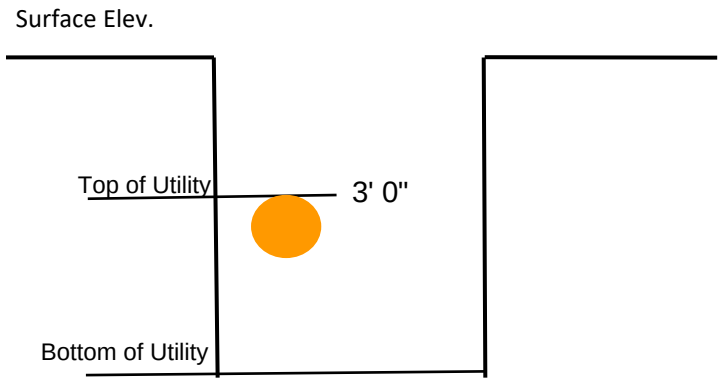
TC – Terra Cotta Pipe
UP – Utility Pole



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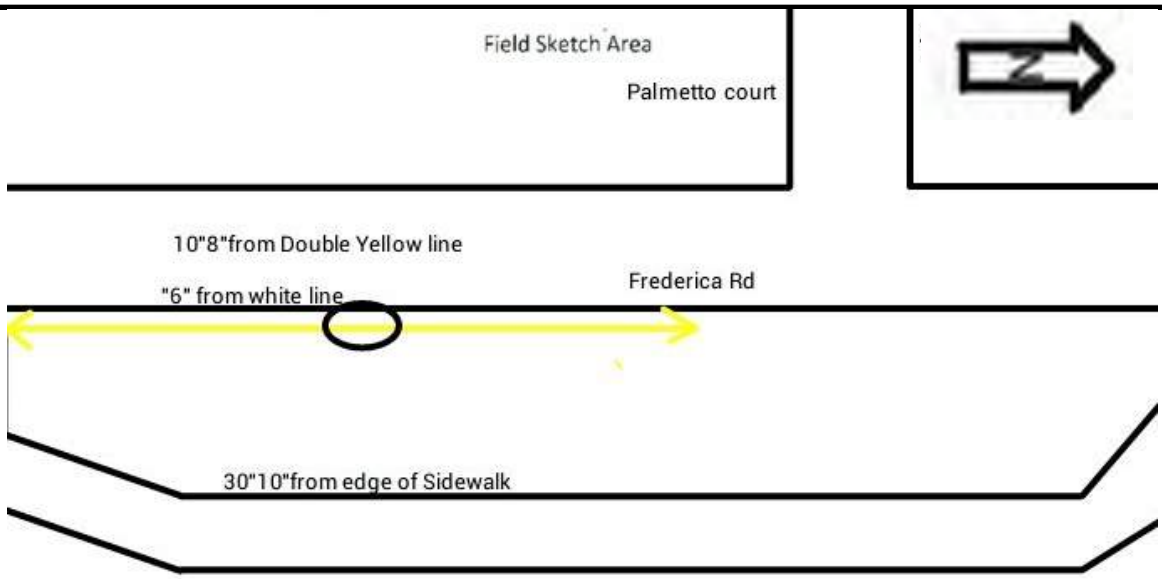
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 34
General Location: Fredrica Road near Palmetto Court Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Gas Size: 4" Material: Steel Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



NOT TO SCALE

Abbreviations:

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CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
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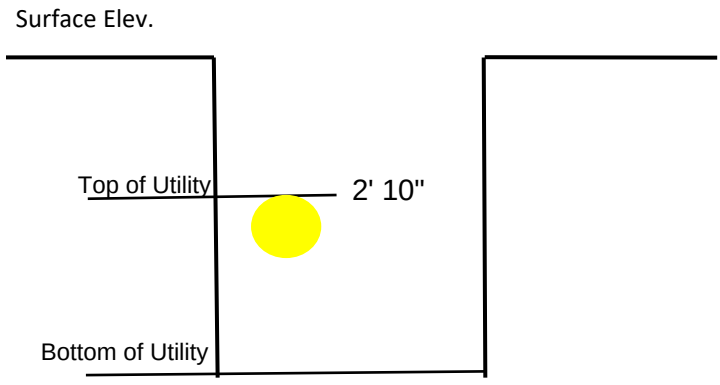
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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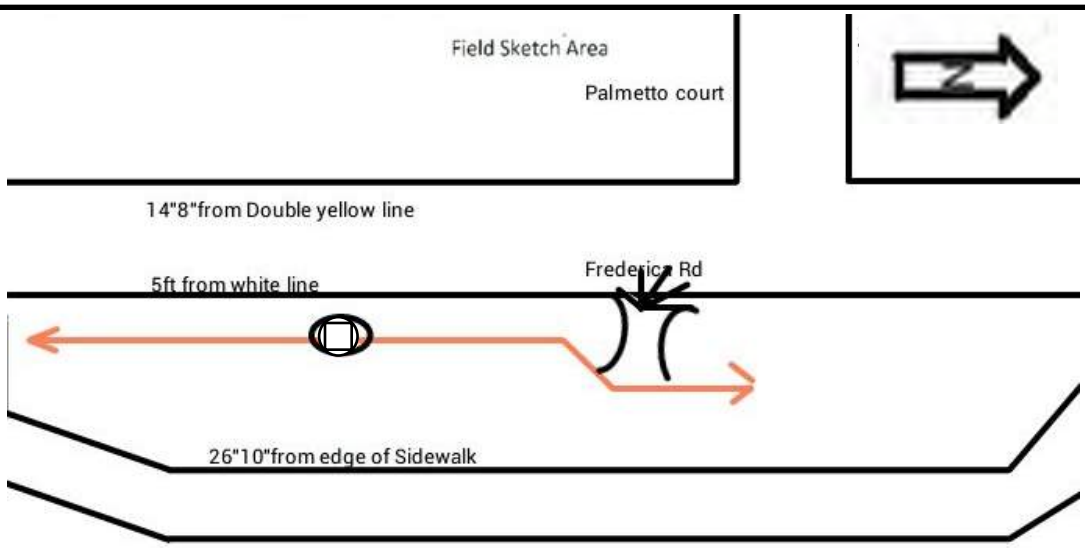
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 35
General Location: Fredrica Road near Palmetto Court Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Telecom Size: 1.5" Material: Cable Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: N/A Soil Type: Sand Field Condition: Good

Field Sketch Area



NOT TO SCALE

Abbreviations:

BM – Benchmark
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
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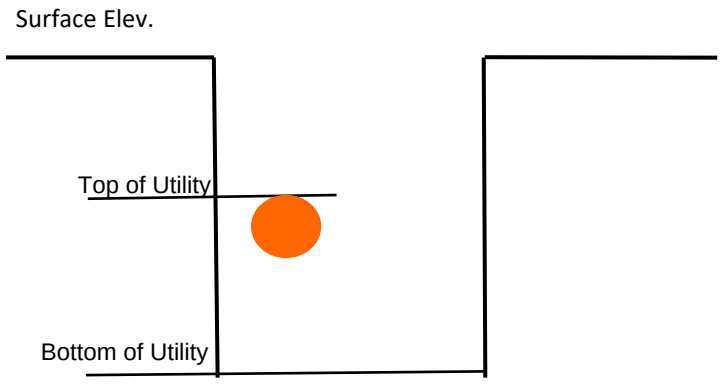
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



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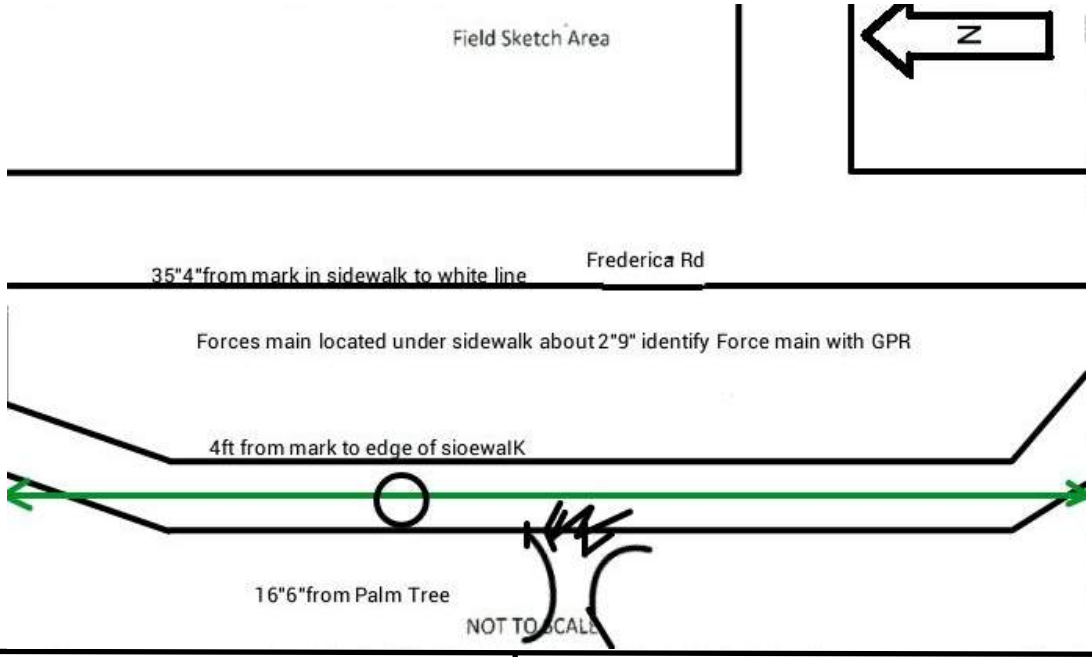
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 36
General Location: Fredrica Road Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: This was under the sidewalk. Depth provided by GPR
Utility: FM Size: 8" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



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CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
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PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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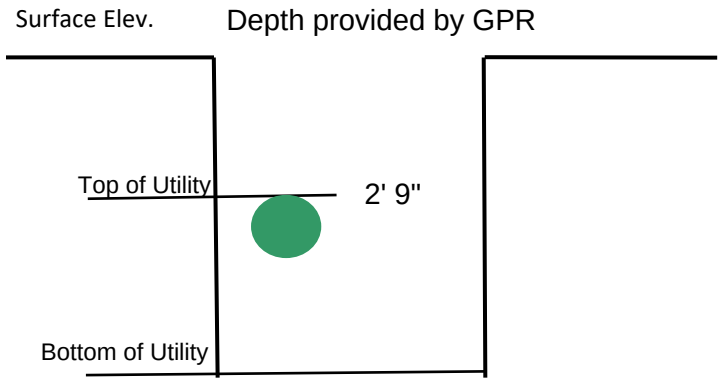
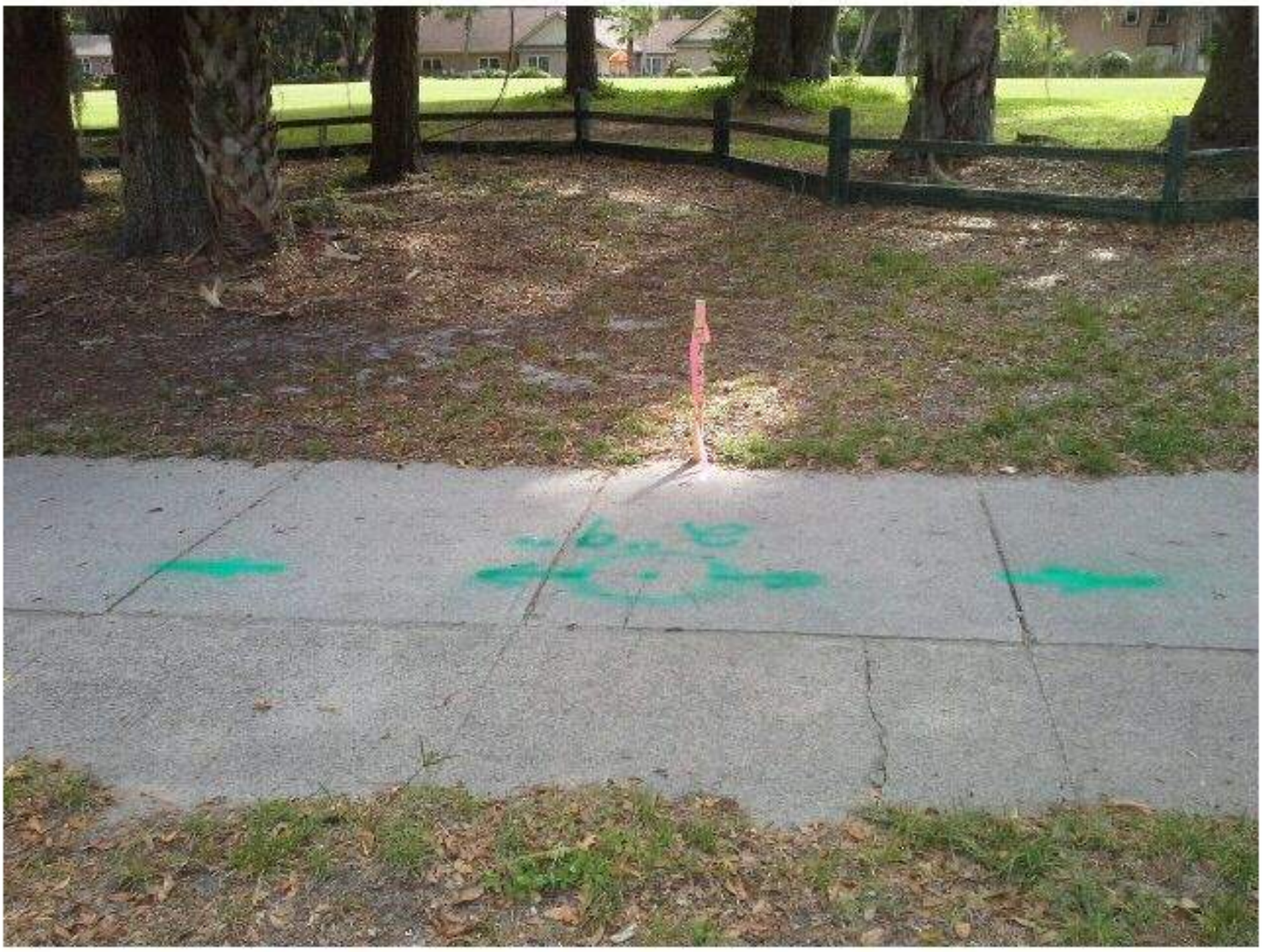
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole





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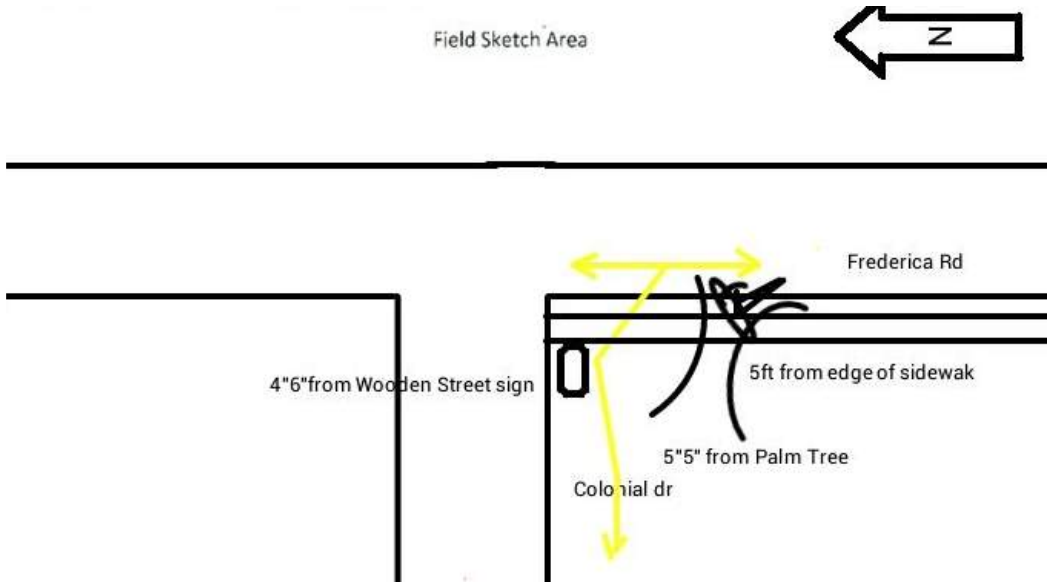
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 37
General Location: Fredrica Road and Colonial Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Gas Size: 4" Material: Plastic Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



NOT TO SCALE

Abbreviations:

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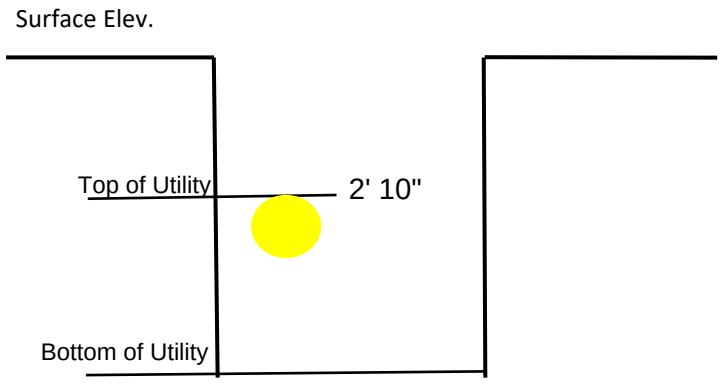
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




Colonial Dr
COLONIAL DRIVE

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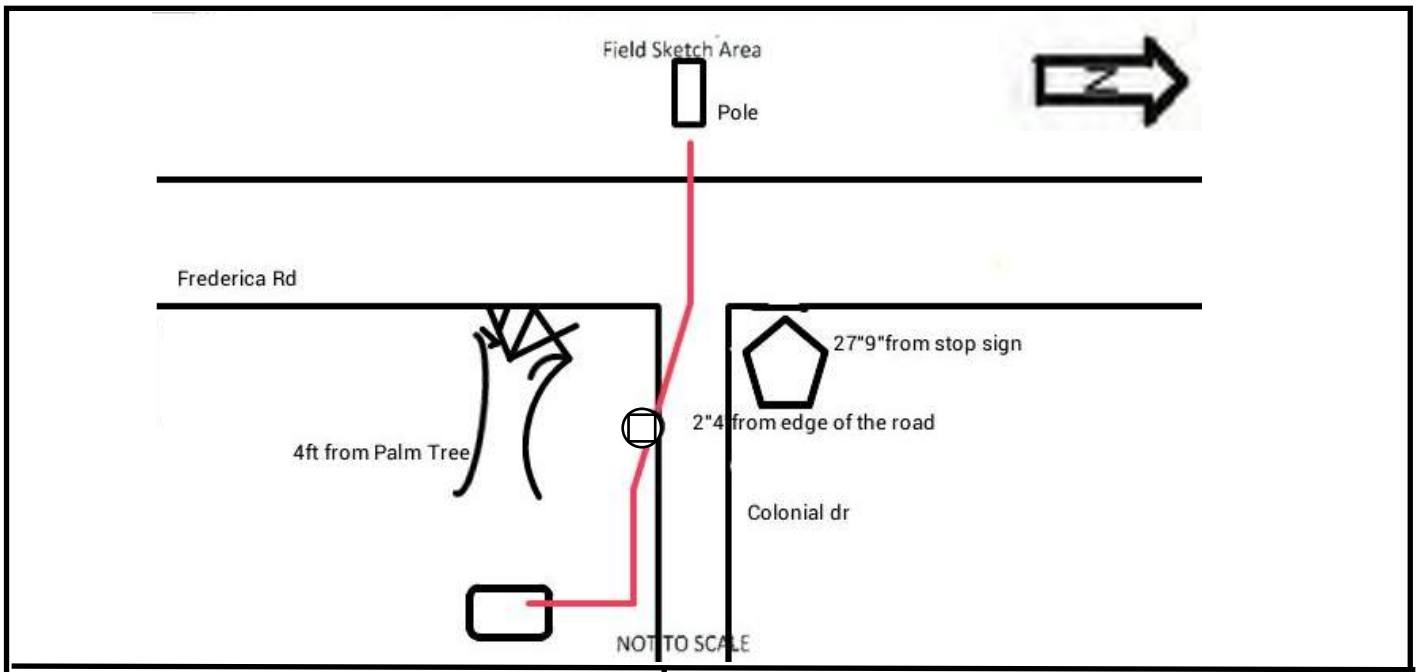
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 38
General Location: Fredrica Road and Colonial Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Power Size: Aprox 3" Material: Cables Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



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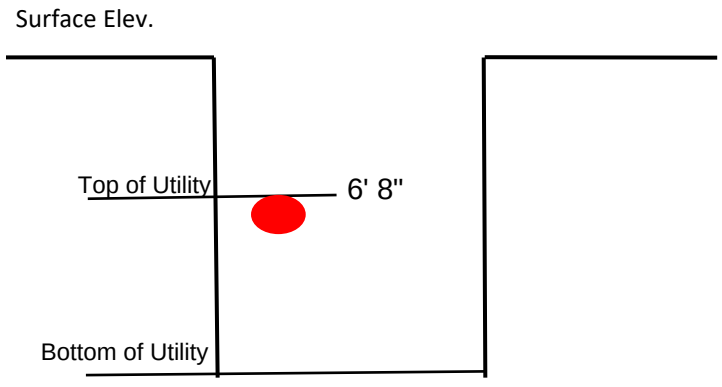
TC – Terra Cotta Pipe
UP – Utility Pole



630 10th St. NW
Atlanta, GA 30318
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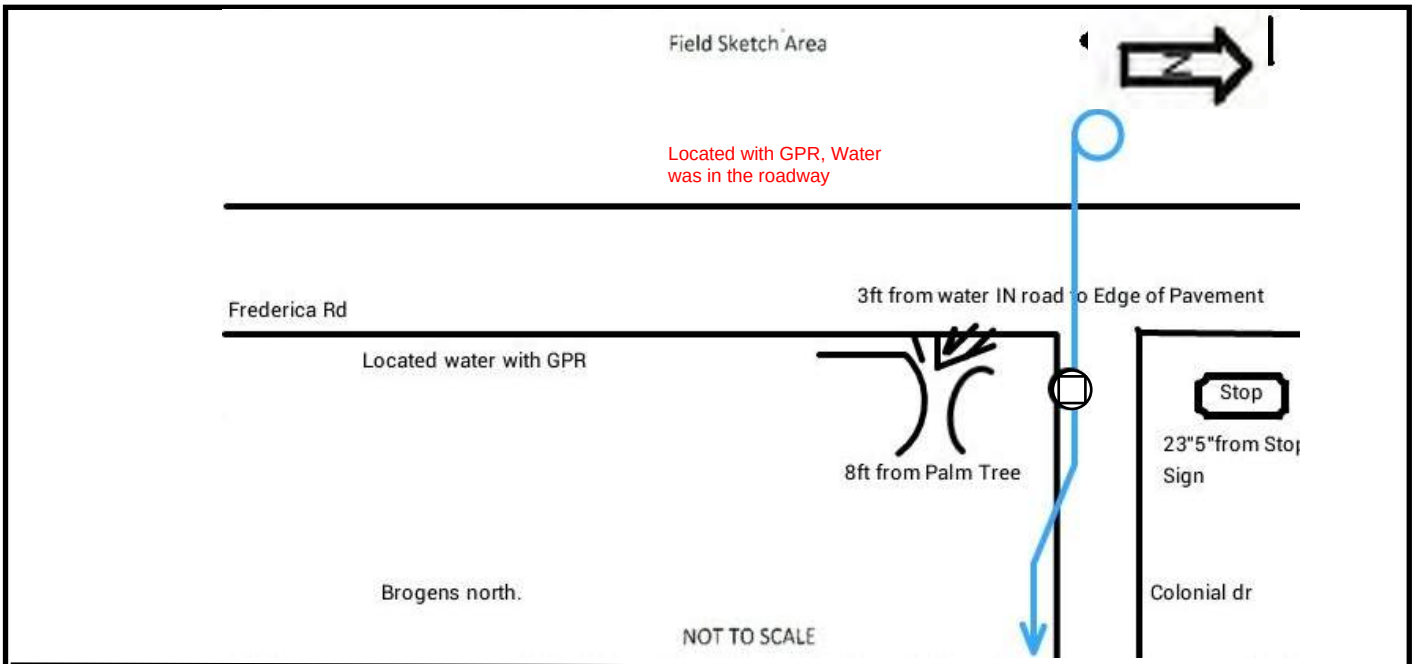
RHDServices.com

Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 39
General Location: Fredrica Road Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: This was under the pavement. Depth by GPR
Utility: Water Size: --- Material: A/C Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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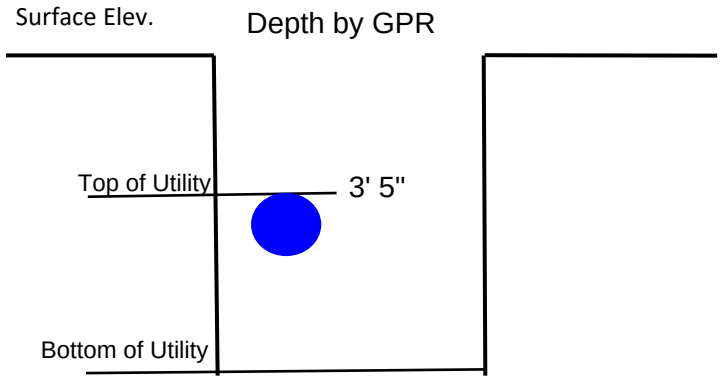
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



630 10th St. NW
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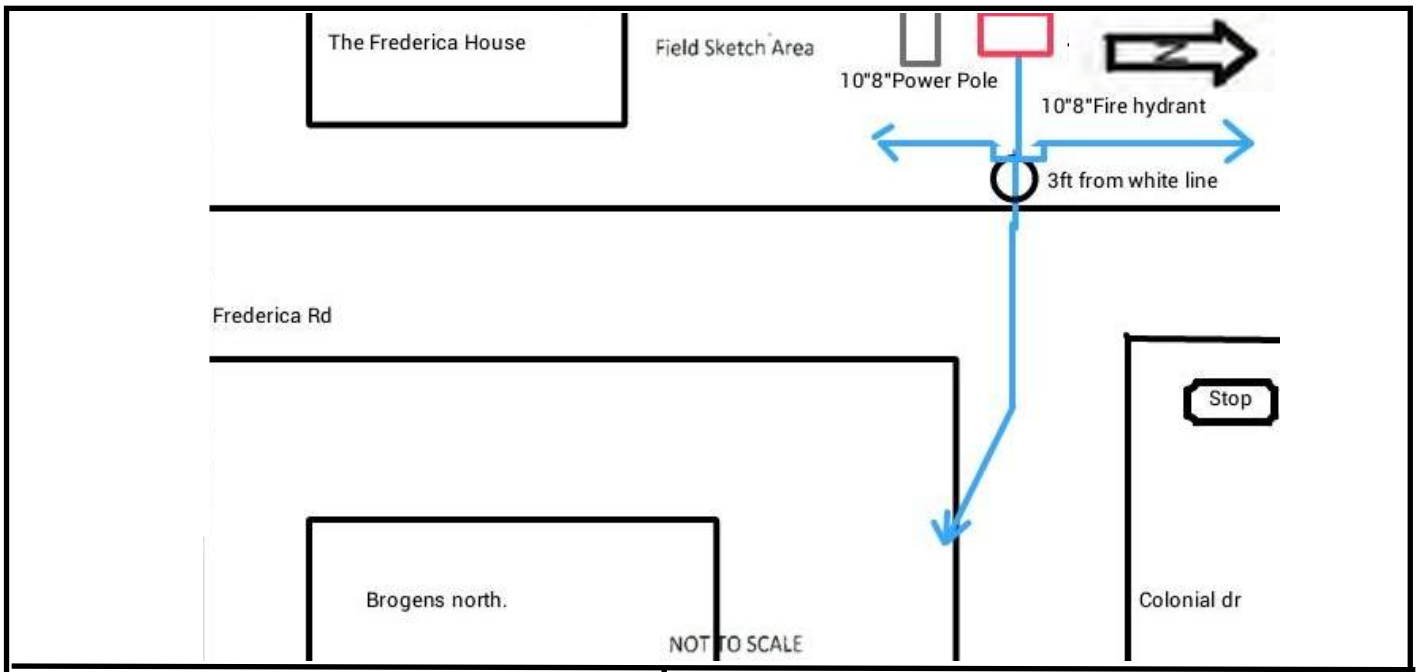
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 40
General Location: Fredrica Road Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Water Size: 6" Material: A/C Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: N/A Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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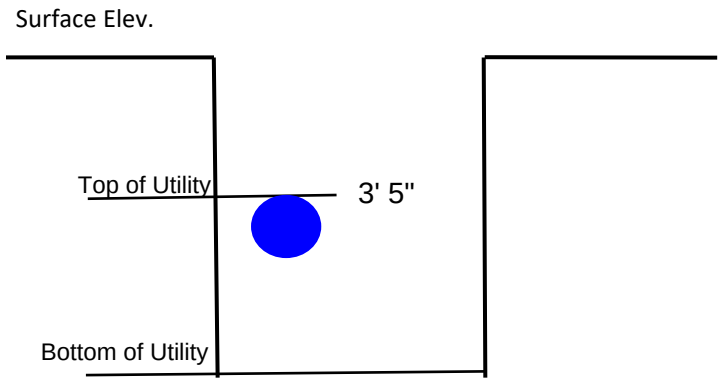
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



630 10th St. NW
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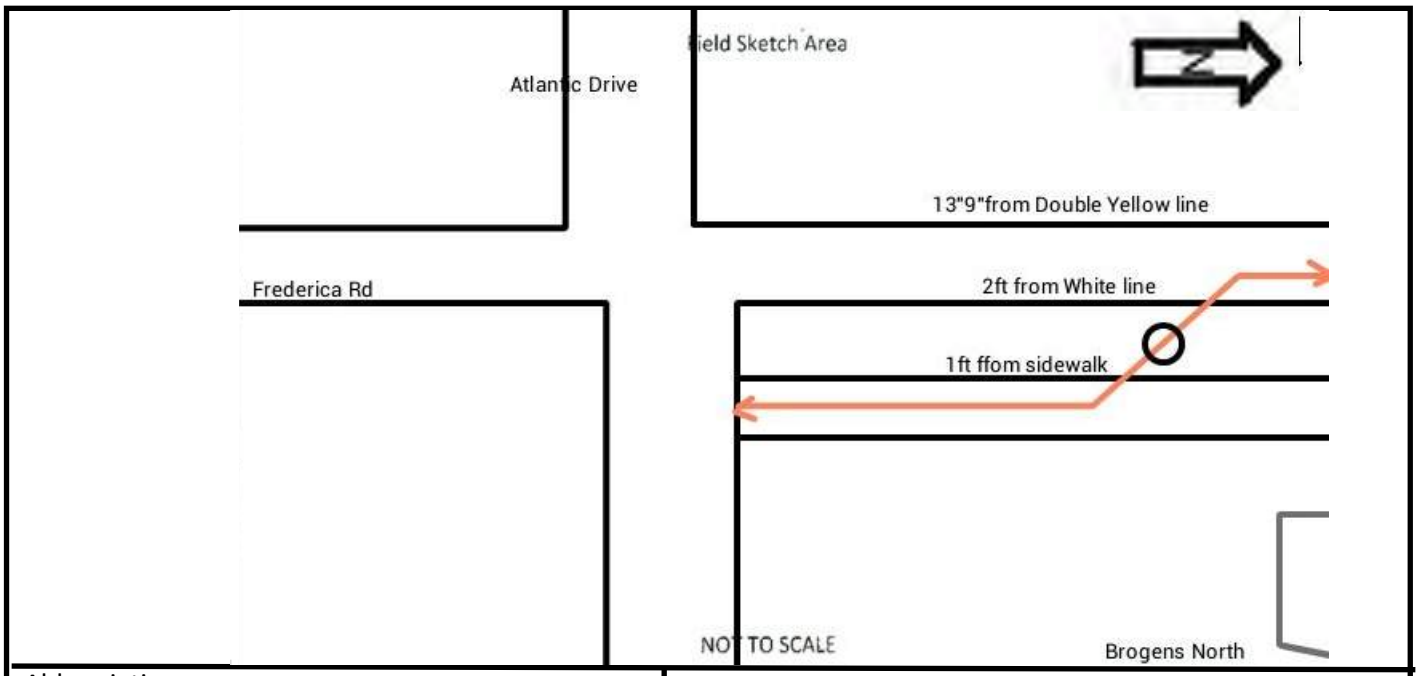
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 41
General Location: Fredrica Road Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Telecom Size: 2" Material: Cable Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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CB – Catch Basin
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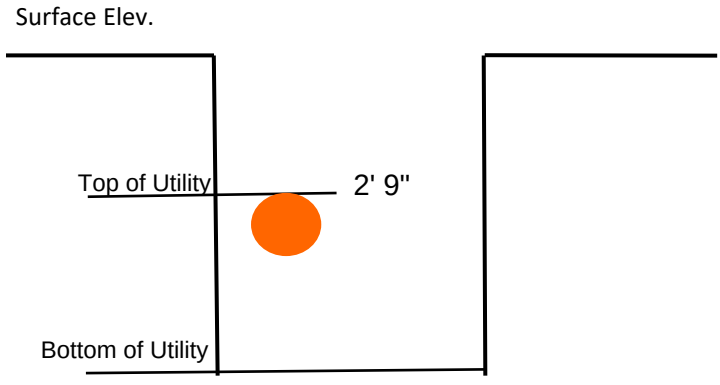
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




HD

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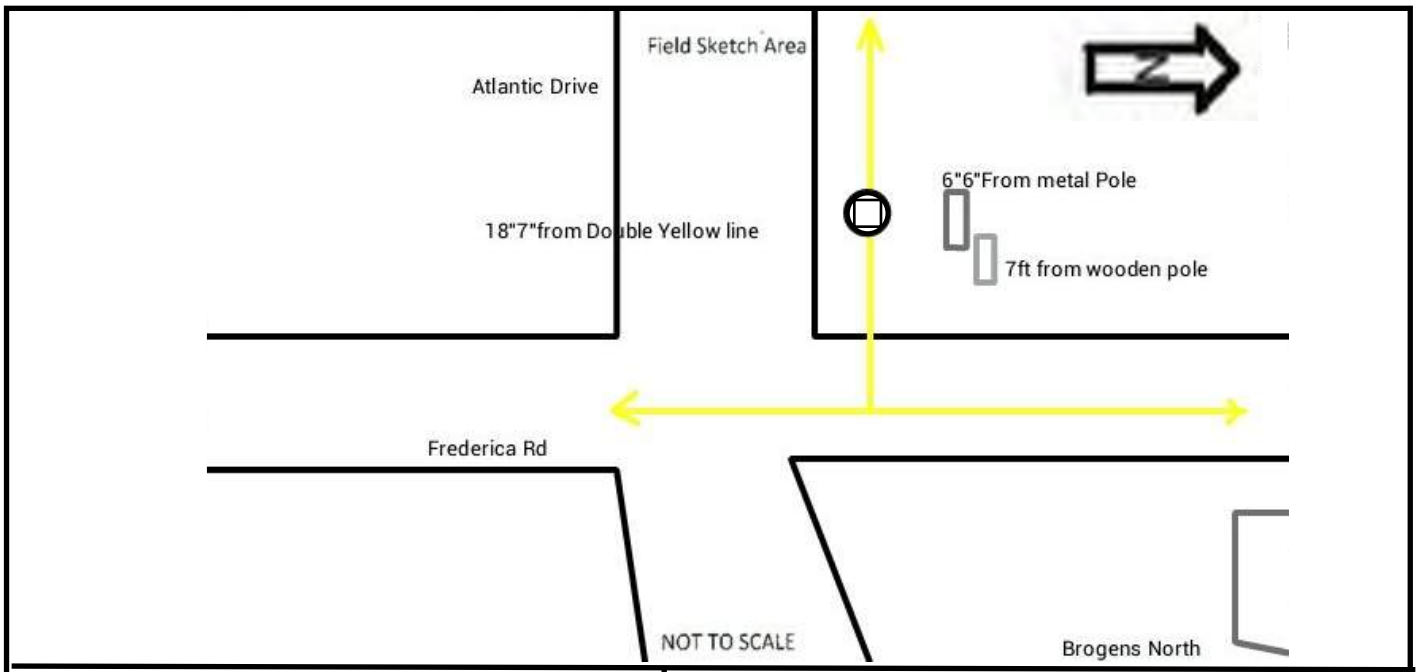
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 42
General Location: Fredrica Road and Atlantic Drive Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Gas Size: 2" Material: Steel Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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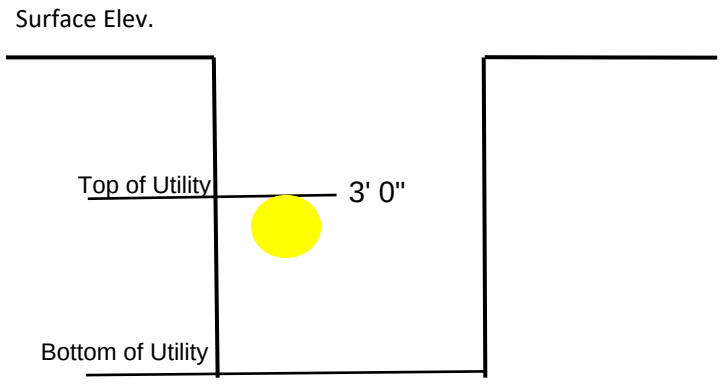
CB – Catch Basin
CIP – Cast Iron Pipe
CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




ntic Dr


ntic Dr

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Atlanta, GA 30318
404-874-8585
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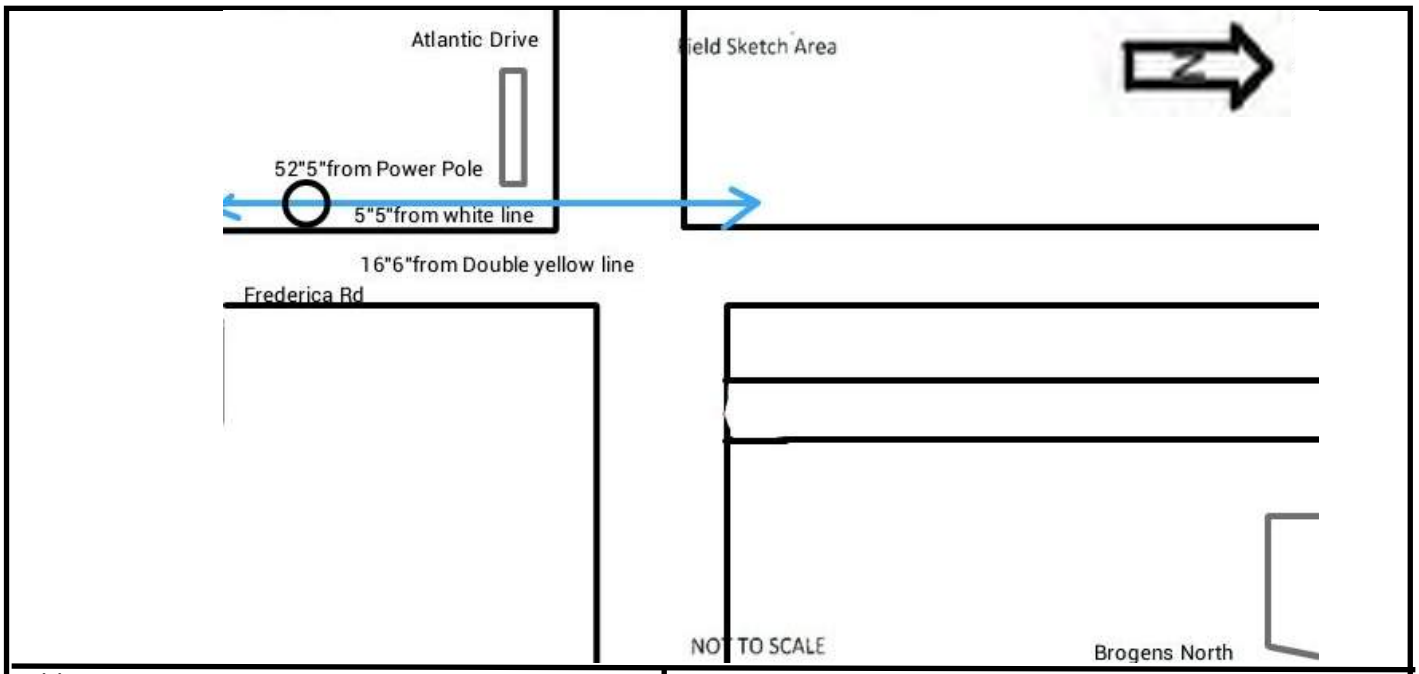
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 43
General Location: Fredrica Road Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Water Size: 12" Material: A/C Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
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PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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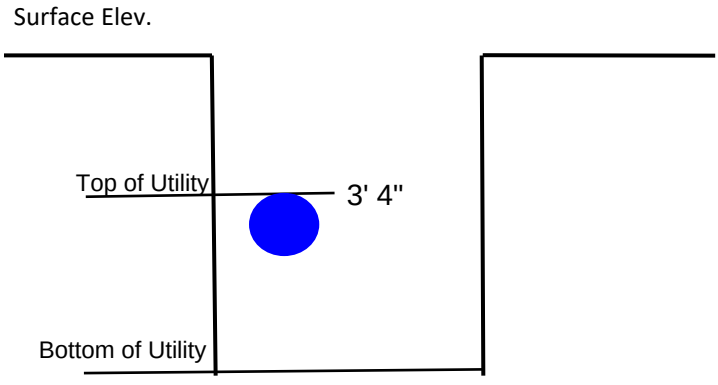
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




RHD

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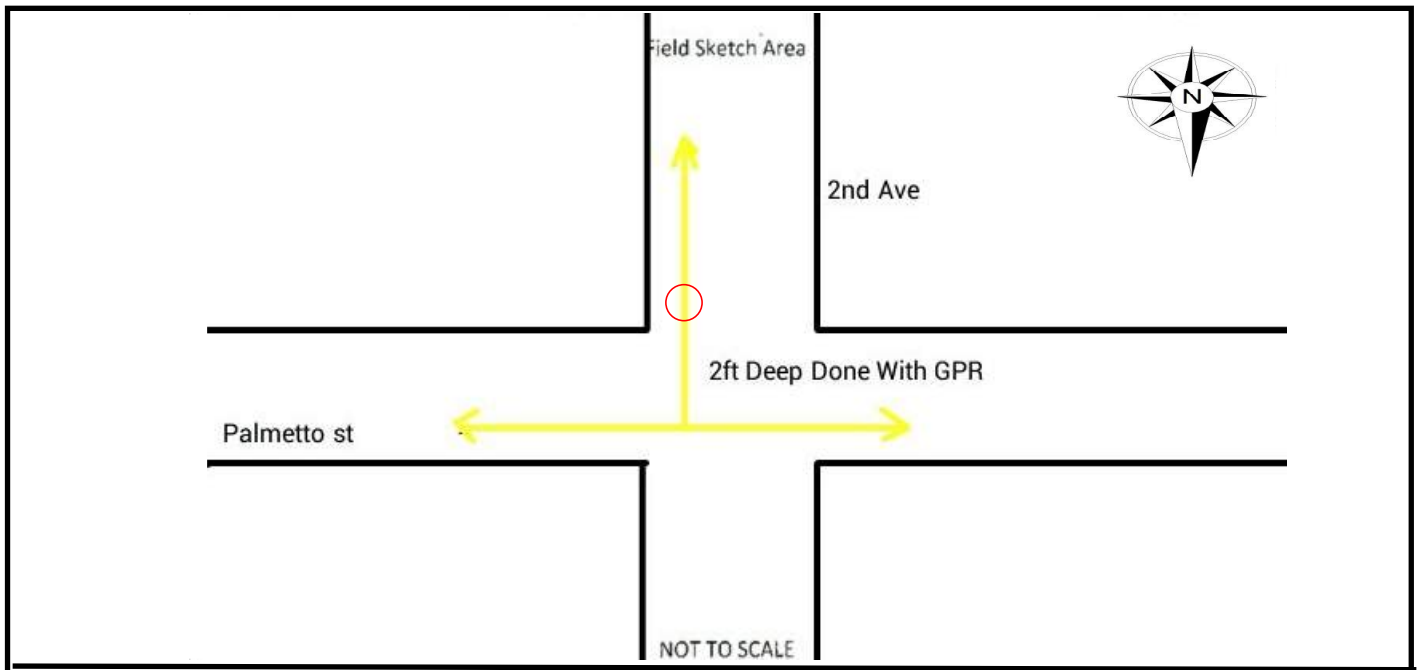
Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 44
General Location: JPalmetto Street & 2nd Ave. Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: Located under pavement. Depth provided by GPR
Utility: Gas Size: 2" Material: Plastic Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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CMP – Corrugated Metal Pipe
DIP – Ductile Iron Pipe
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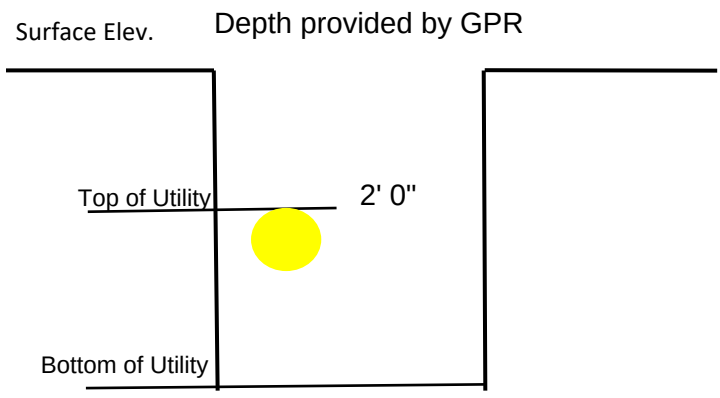
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



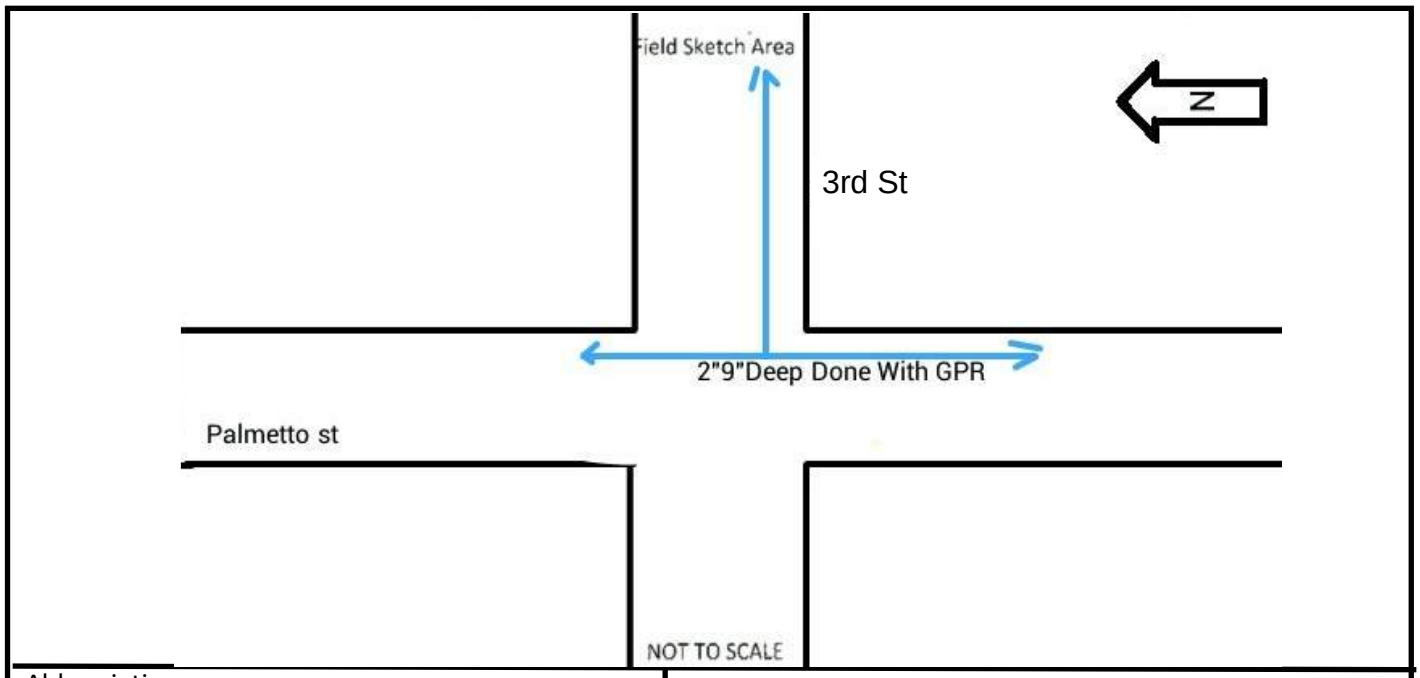

Palmetto

630 10th St. NW
Atlanta, GA 30318
404-874-8585
RHDServices.com

Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 45`
General Location: Fredrica Road and 3rd Street Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: Located under pavement. Depth provided by GPR
Utility: Water Size: --- Material: Plastic Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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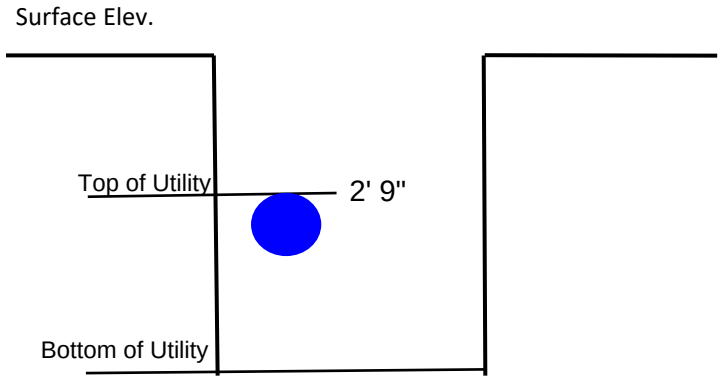
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
ROW – Right of Way
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



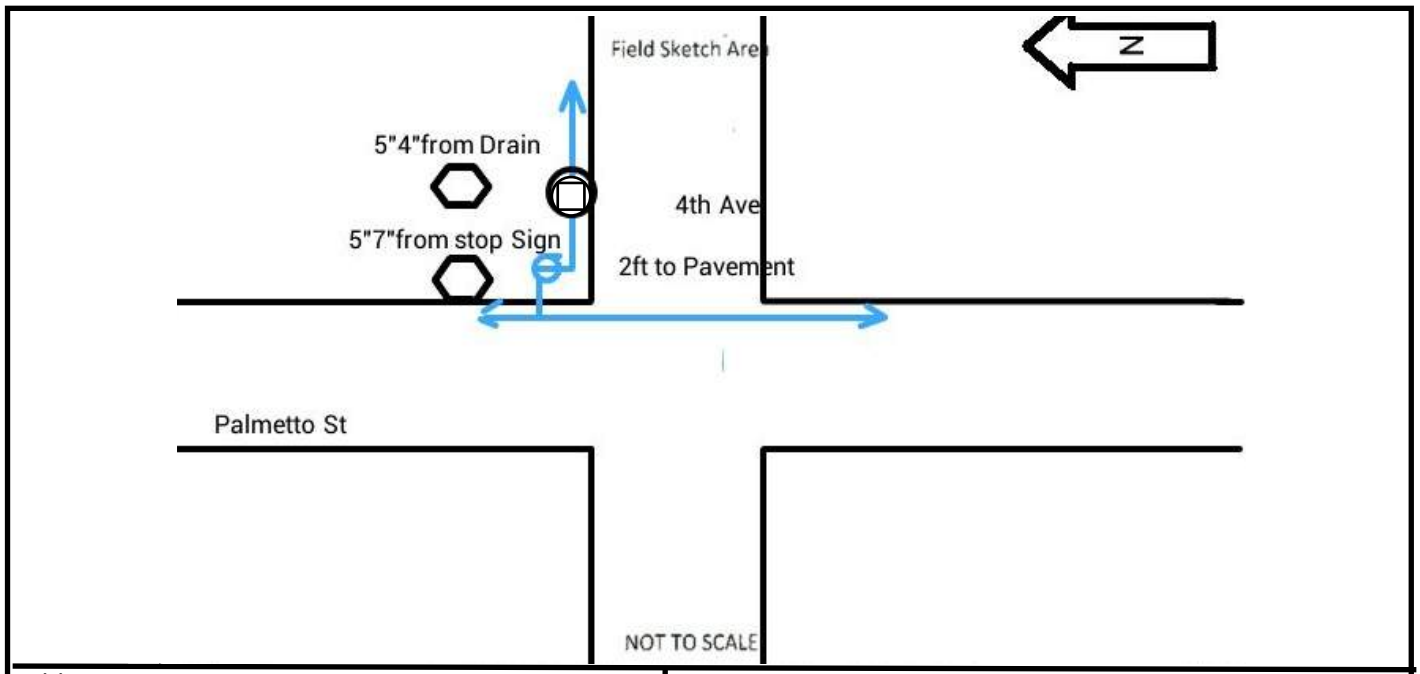

Third Ave

630 10th St. NW
Atlanta, GA 30318
404-874-8585
RHDServices.com

Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 46
General Location: Fredrica Road Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Water Size: 2" Material: PVC Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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DIP – Ductile Iron Pipe
EP – Edge of Pavement
FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
RCP – Reinforced Concrete Pipe
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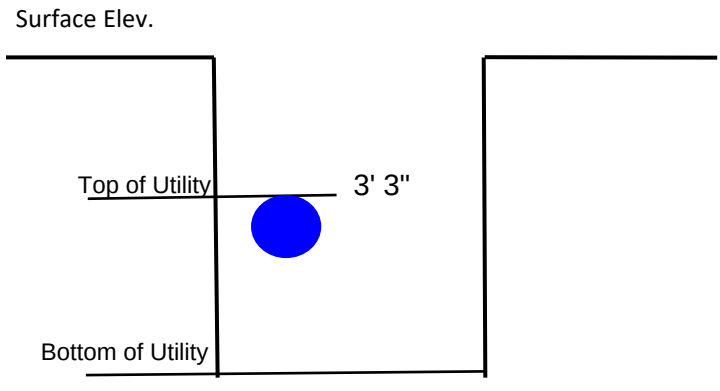
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




Palmetto

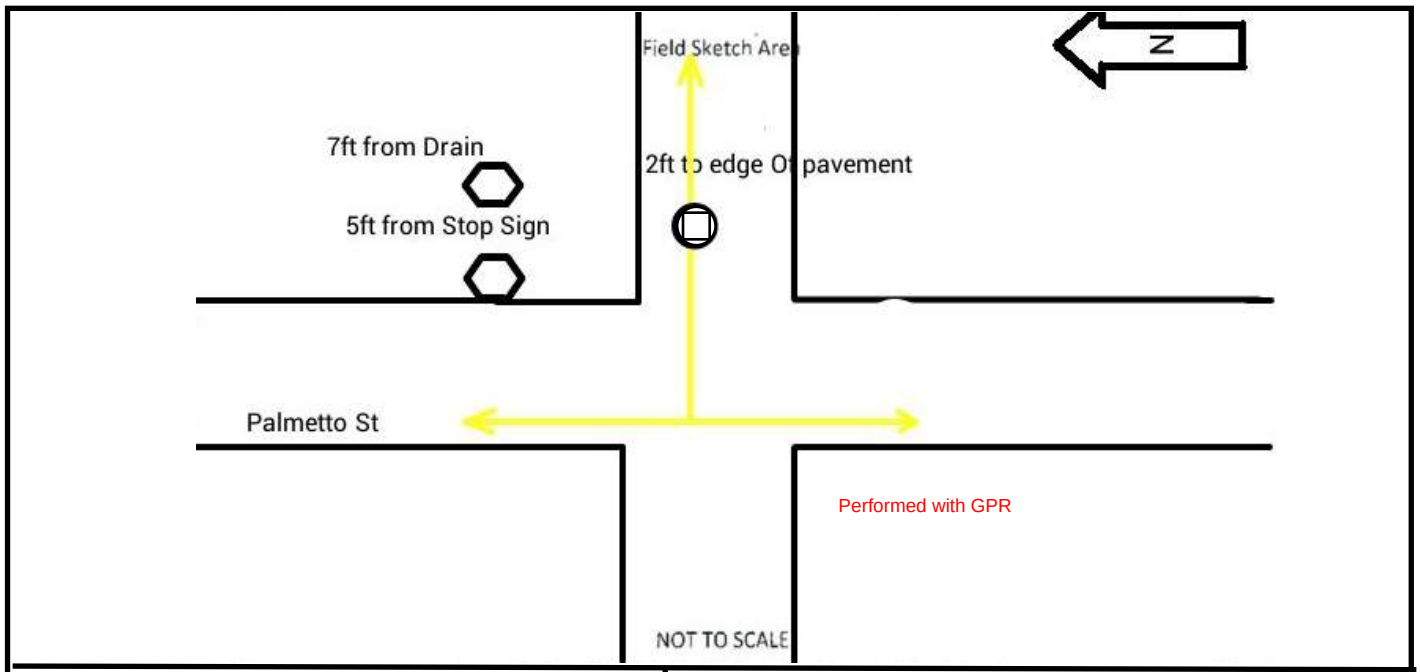

Fourth Ave
STOP

630 10th St. NW
Atlanta, GA 30318
404-874-8585
RHDServices.com

Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 47
General Location: Fredrica Road and Fourth Ave Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: Located under pavement. Depth provided by GPR
Utility: Gas Size: --- Material: Plastic Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



Abbreviations:

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DIP – Ductile Iron Pipe
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FH – Fire Hydrant
PLS – Plastic Pipe
PVC – Polyvinyl Chloride Pipe
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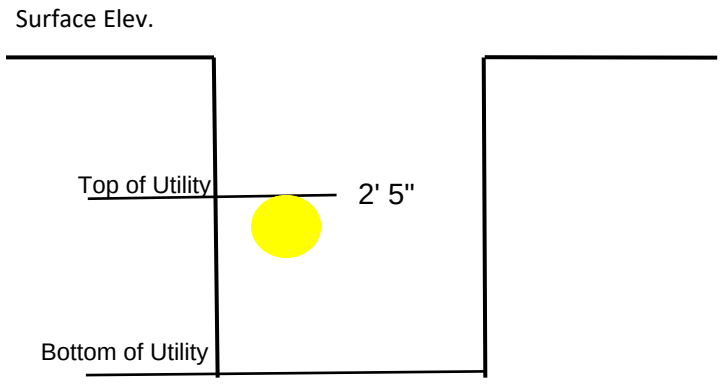
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole



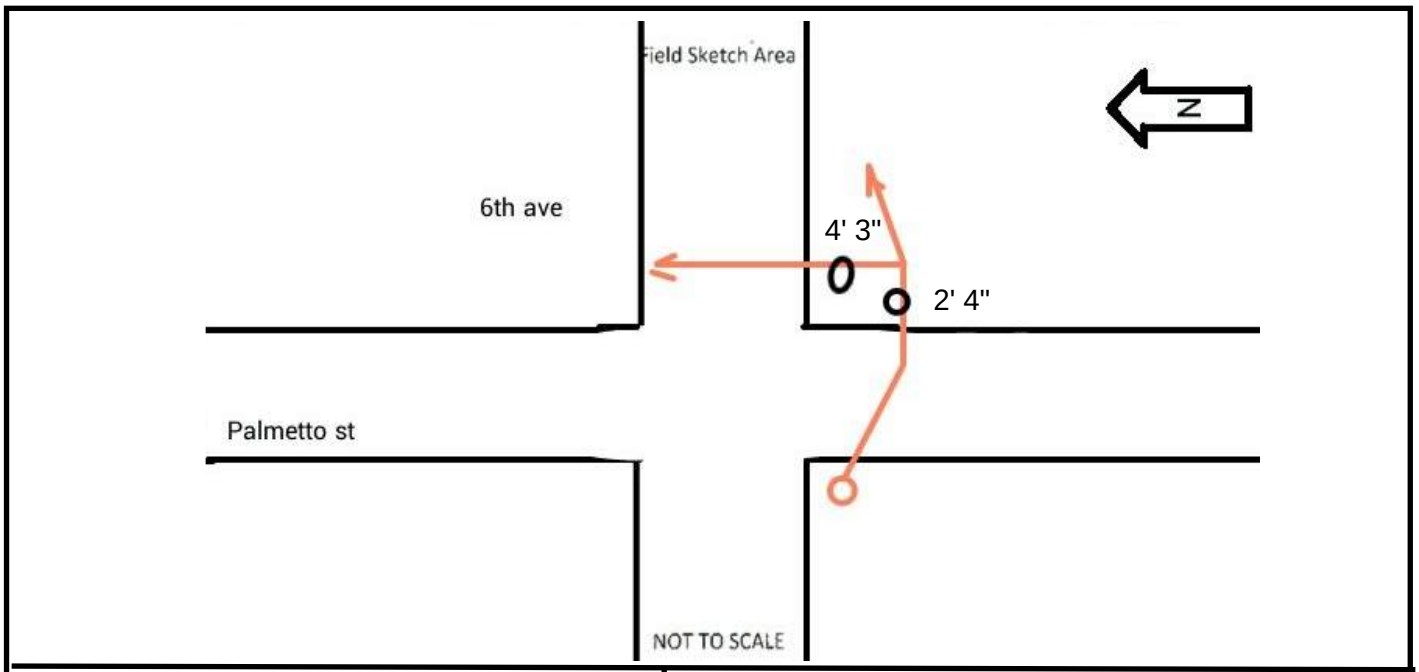

almetto St

630 10th St. NW
Atlanta, GA 30318
404-874-8585
RHDServices.com

Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 48
General Location: Fredrica Road and 6th Ave Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes:
Utility: Telecom Size: Aprox 2" Material: Conduit Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: Soil Type: Sand Field Condition: Good

Field Sketch Area



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FH – Fire Hydrant
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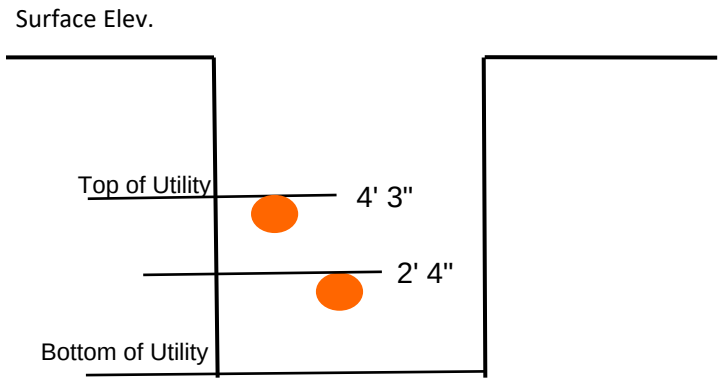
STL – Steel
SW – Sidewalk
TC – Terra Cotta Pipe
UP – Utility Pole




Sixth Ave
Palmetto St

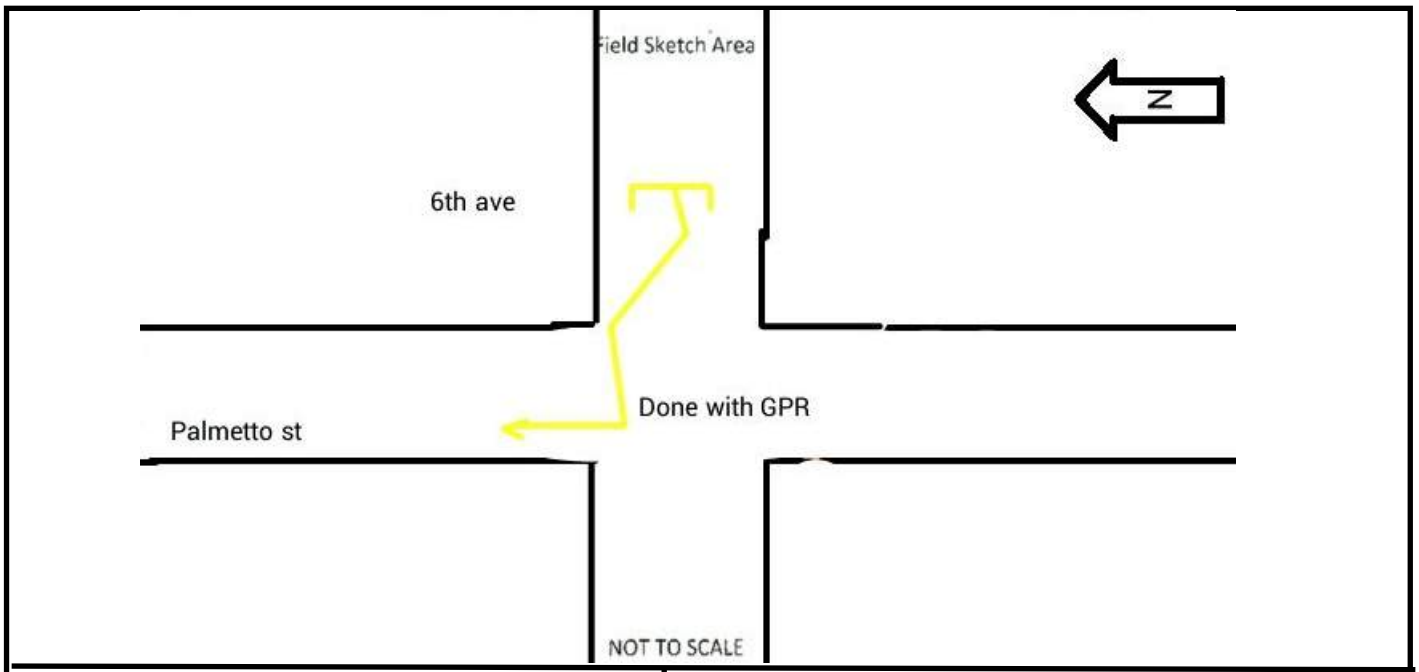

Sixth Ave

630 10th St. NW
Atlanta, GA 30318
404-874-8585
RHDServices.com

Quality Level-A Utility Test Hole Report

Client: Four Waters Engineering, Inc. Project: Sea Island Road Test Hole# 49
General Location: Fredrica Road and 6th Ave. Date: (8-22-16)-(8-27-16)
City: St. Simons Island County: Glen County State: GA Crew Chief: Ira
Notes: Located under pavement. Depth provided by GPR
Utility: Gas Size: --- Material: Plastic Condition: Good Ribbon Color:
Maker Set: Asphalt Thickness: n/a Soil Type: Sand Field Condition: Good

Field Sketch Area



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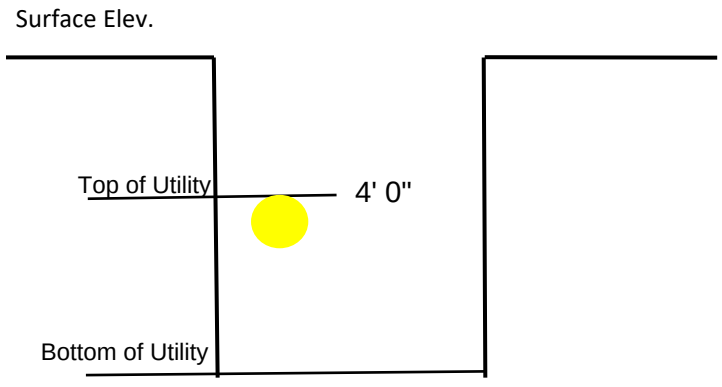
UP – Utility Pole



PUMP STATION 2032 REGIONAL FORCEMAIN IMPROVEMENTS
ST. SIMONS ISLAND, GEORGIA

ATTACHMENT

Wetland Evaluation Letter: Field Inspections for Wetlands on Proposed JWSC LS2032 Forcemain Project

Southeastern Environmental Associates, LLC

Sam N. Latham & Son
710 Ft. McIntosh Loop
Hortense, Georgia 31543

Office: 912-778-5850
Mobile: 912-223-2865
slatham7@hotmail.com

August 24, 2016

Four Waters Engineering, Inc.
ATTN: Michael Klink
324 6th Avenue North
Jacksonville Beach, FL 32250

RE: Field site inspections for wetlands on the proposed JWSC LS2032 Forcemain Project on St. Simons Island, Glynn County, Georgia

Dear Michael,

Southeastern Environmental Associate (SEA) performed 08/18/2016 field site inspections on the above mentioned site to determine the locations, extent, and jurisdiction of any wetlands on this site. SEA is pleased to inform you that our inspections revealed that, in our professional opinions, there are no wetlands present here that would be impacted by this project.

The drainage ditch located at LS 2032 near Station 11 + 75 that you had mentioned some concern about is not close enough to the construction area to be impacted, however, we do believe that your idea to place the silt screen around any drainage ditches that are close to the construction areas is good so there is no questions about a possible impact.

Sincerely,

Sam N. Latham

PUMP STATION 2032 REGIONAL FORCEMAIN IMPROVEMENTS
ST. SIMONS ISLAND, GEORGIA

ATTACHMENT

Georgia Environmental Protection Division LS2032 Regional FM Improvements Project NPDES Permit No. GA0021521

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Watershed Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1152, East Tower
Atlanta, Georgia 30334
404-463-1511

October 5, 2016

Mr. Jimmy Junkin, Executive Director
Brunswick-Glynn Joint Water & Sewer Commission
1703 Gloucester Street
Brunswick, Georgia 31520

RE: Lift Station 2032 Regional Forcemain Improvement
Plans and Specifications
NPDES Permit No. GA0021521
EPD # 2016-255
Glynn County

Dear Mr. Junkin:

We are in receipt of the plans and specifications for the above-referenced project. Your project has not been selected for review by the Wastewater Regulatory Program.

If you have any questions, please contact me at 404-463-4936 or at *Yilin.fan@dnr.ga.gov*.

Sincerely,

Yilin Fan

Yilin Fan
Municipal Permitting Unit
Wastewater Regulatory Program

cc: Ms. Angela Bryan, P.E. –Four Waters Engineering, Inc. (abryan@4WEng.com)