St. Johns River
Water Management District
Ann B. Shortelle, Ph.D., Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • (386) 329-4500
On the Internet at www.sjrwmd.com.

DATE: November 1, 2018
TO: Prospective Respondents
FROM: Pam Paulk, Sr. Procurement Specialist
SUBJECT: Addendum #1 to Invitation for Bids, IFB #33711 PRARIE CREEK DIVERSION STRUCTURE REPLACEMENT

As a result of inquiries from the Pre-Bid meeting onsite, the following clarifications/changes are provided for your information. Please make all appropriate changes to your proposal documents. Note: changes are reflected with original language shown with strike-through and new language is underlined.

MODIFICATIONS:

1. Delete the Cost Schedule and replace it with the attached Revised Cost Schedule as Item No. 28 was deleted from the original Cost Schedule.

2. Attachment A to the Agreement, Section IV Task Identifications #11 and #12 shall be modified as follows:

    11. Demolition - Concrete Slab

    Remove and dispose of the downstream concrete slab to an offsite location. ~~Tree removal shall be minimized as much as possible; tree survey was not performed and trees to be removed are not noted on the construction drawings.~~ Disposal methods and location shall be in accordance with all applicable local, state, and federal regulations and requirements.

    12. Tree Removal

    Remove and dispose of trees as needed to an offsite location. Tree removal shall be minimized as much as possible; tree survey was not performed and trees to be removed are not noted on the construction drawings. Disposal methods and location shall be in accordance with all applicable local, state, and federal regulations and requirements.

ADDITIONAL INFORMATION:

1. Attached is a copy of the geotechnical report by Ardaman & Associates, Inc.: Subsurface Soil Exploration and Geotechnical Engineering Evaluation Prairie Creek Diversion 4-17-18, which shall be Attachment F to the Agreement.

2. Attached is a copy of the Mandatory Pre-bid Meeting Sign-In Sheet.

3. The Pre-Bid Meeting was digitally audio taped and was uploaded the District's FTP site as it and onto Demandstar.com as well. The audio file may be obtained on ftp://ftp.sjrwmd.com/IFB%2033711/ and it is titled IFB 33711 Pre-Bid Meeting Audio 10-30-18. The .wma file may be listened to using the Microsoft Media Audio program. Although, it may take a few minutes to down load, should you not be able to open it please contact Pam Paulk for further instructions to access this file.

NOTE: The Bid Opening remains the same, November 19, 2018 at 2:00 PM.

Please acknowledge receipt of this Addendum on the BID FORM provided in the bid package.

If you have any questions, please call me at (386) 329-4469 or e-mail ppaulk@sjrwmd.com.

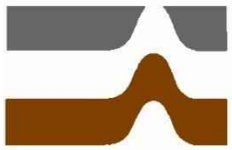
IFB 33711 REVISED COST SCHEDULE PRAIRIE CREEK STRUCTURE REPLACEMENT					
ITEM NO.	**DESCRIPTION AND ASSUMPTIONS**	**ESTIMATED QUANTITY**	**UNIT**	**UNIT PRICE**	**TOTAL AMOUNT**
1	*** MOBILIZATION / DEMOBILIZATION**	1	LS		
2	**EROSION/SEDIMENT CONTROL**	1	LS		
3	**ACCESS ROAD REPAIR**	1	LS		
4	**TEMPORARY COFFERDAMS**	1	LS		
5	**PUMPING/DEWATERING**	1	LS		
6	**DEMOLITION - GUARDRAIL**	1	LS		
7	**DEMOLITION - FENCE**	1	LS		
8	**DEMOLITION - FABRIFORM REVETMENT**	1	LS		
9	**DEMOLITION - CULVERTS AND GATES**	1	LS		
10	**DEMOLITION - CONCRETE HEAD WALLS**	1	LS		
11	**DEMOLITION - CONCRETE SLAB**	1	LS		
12	**TREE REMOVAL**	1	LS		
13	**EARTHWORK - STRUCTURE EXCAVATION**	1	LS		
14	**EARTHWORK - BACKFILL AND COMPACTION**	1	LS		
15	**EARTHWORK - LEVEE LIMEROCK CAP**	1	LS		
16	**CONCRETE FOOTINGS**	1	LS		
17	**CONCRETE WALLS**	1	LS		
18	**ALUMINUM CULVERTS**	1	LS		
19	**ALUMINUM SLIDE GATES**	1	LS		
20	**ALUMINUM RAILING**	1	LS		
21	**TIMBER GUARDRAIL**	1	LS		
22	**CATTLE FENCE**	1	LS		
23	**GEOTEXTILE**	400	SY		
24	**BEDDING STONE**	100	TONS		
25	**RIPRAP**	270	TONS		
26	**SODDING AND HYDROSEEDING**	1	LS		
27	**SITE CLEANUP AND DEMOBILIZATION**	1	LS		
28	**CONTINGENCY**	-	-		$30,000
				TOTAL BID COST	

* 60% of this item will be allocated for payment of mobilization and 40% upon completion of demobilization.

LS = Lump sum

SY = Square Yard

Subsurface Soil Exploration and
Geotechnical Engineering Evaluation
Prairie Creek Diversion Structure Replacement
Alachua County, Florida



Ardaman & Associates, Inc.

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MEMBERS:
A.S.F.E.
American Concrete Institute
ASTM International
Florida Institute of Consulting Engineers

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

February 28, 2018
File No. 18-6313
Revised April 17, 2018

St. Johns River Water Management District
4049 Reid Street
Palatka, Florida 32718-1429

Attention: Mr. Wayne Dempsey, P.E.

Subject: Subsurface Soil Exploration and
Geotechnical Engineering Evaluation
Prairie Creek Diversion Structure Replacement
Alachua County, Florida

Dear Mr. Dempsey:

As requested and authorized, we have completed a shallow subsurface soil exploration for the subject project. The purpose of performing this exploration was to explore general subsurface conditions at the location of the existing culverts at the Prairie Creek Diversion Structure that connect Camps Canal to Paynes Prairie. We understand that the data gathered will be used by SJRWMD in the design and construction process to remove and replace the current culvert pipes. We have also provided design soil parameters for sheet pile walls that may be required during construction. This report documents our findings.

We are pleased to be of assistance to you on this phase of the project. When we may be of further service to you or should you have any questions, please contact us.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.
Certificate of Authorization No. 5950

for Virginia A. Goff, E.I.
Assistant Project Engineer

Charles H. Cunningham, P.E.
Orlando Branch Manager
Florida License No. 38189

CHARLES H. CUNNINGHAM LICENSE No. 38189 STATE OF FLORIDA PROFESSIONAL ENGINEER

VAG/CHC/nfm
18-6313 Rev Prairie Creek.docx

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1.0 SITE LOCATION AND DESCRIPTION

The site for the proposed improvements is located in Alachua County, Florida (Section 25, Township 10 South, Range 20 East). The general site location is shown superimposed on the Micanopy, Florida U.S.G.S. quadrangle map presented on Figure 1.

The site is currently developed with the existing Camps Canal Levee and the existing Prairie Creek Diversion Structure which includes three culvert pipes.

2.0 PROPOSED CONSTRUCTION

It is our understanding that the proposed development includes the removal of the three existing culvert pipes and replacing with three new 54-inch diameter culvert pipes with an approximate invert elevation of 58 feet (NAVD 88) based on the “Section and Elevations” conceptual sheet set designated Sheet S2 dated February 28, 2018. In addition, we understand that new headwalls and wingwalls will be constructed at the diversion structure. Based on discussion with you and Mr. Bill Cote, P.E. of SJRWMD and review of the updated plan set dated February 28, 2018, we understand that alterations were made to the plan set dated January 25, 2018 in order to minimize the additional fill height on the west side of the subject levee section, and that the levee in the culvert replacement area is to be reconstructed to similar location, shape and height to that of the existing levee. We assume that sheet pile walls may be needed to facilitate the dewatering of the open-cut excavation and backfilling of the affected levee section.

3.0 REVIEW OF SOIL SURVEY MAPS

Based on the 1975 Soil Survey for Alachua County, Florida, as prepared by the U.S. Department of Agriculture Soil Conservation Service, the site is located in an area mapped as the "Emeralda fine sandy loam" soil series. The "Emeralda fine sandy loam" soil series consists of nearly level, sandy loam and sandy soil in relatively small areas on rolling uplands of the prairies and in broad wet areas of the flatwoods. The internal drainage of the "Emeralda fine sandy loam" is poor and the soil permeability is rapid in the surface and subsurface layers and very slow to slow in the subsoil. According to the Soil Survey, the seasonal high water table for the "Emeralda fine sandy loam" soil series is typically less than 10 inches of the natural ground surface.

4.0 FIELD EXPLORATION PROGRAM

4.1 SPT Borings

The field exploration program included performing two Standard Penetration Test (SPT) borings. The SPT borings were advanced to a depth of 45 feet below the ground surface using the methodology outlined in ASTM D-1586. A summary of this field procedure is included in Appendix I. 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 in sealed sample jars.

An attempt was made to measure the groundwater level at each of the boring locations during drilling. The borings were grouted with cement-bentonite slurry upon completion.

4.2 Test Locations

The approximate locations of the borings are schematically illustrated on the Boring Location Plan on Figure 2. The boring locations were staked in the field by SJRWMD Engineer, Mr. Wayne Dempsey, P.E. and Ardaman and Associates Engineer, Mr. Chuck Cunningham, P.E. The borings were performed in the approximate middle of the levee road. These locations were later determined in the field by Global Positioning System (GPS) utilizing hand-held GPS equipment and coordinates obtained from Google Earth V6.1. Boring locations should be considered accurate only to the degree implied by the method of locating used.

5.0 LABORATORY TESTING PROGRAM

5.1 Visual Examination and Classification Testing

Representative soil samples obtained during our field sampling operation were packaged and transferred to our laboratory for further visual examination and classification. The soil samples were visually classified in general accordance with the Unified Soil Classification System (ASTM D-2488). The resulting soil descriptions are shown on the soil boring profiles presented on Figure 3.

In addition, we conducted five organic content tests (ASTM D2974-87), eight natural moisture content tests (ASTM D2216), nine percent fines analyses (ASTM D1140), and three Atterberg limits test (ASTM D4318) on selected soil samples obtained from the borings. The results of these tests are presented adjacent to the sample depth on the boring profiles on Figure 3.

5.2 Corrosion Property Testing

Two composite soil samples and one water sample obtained from Camps Canal were tested for corrosion properties. Properties tested included pH, resistivity, chloride and sulfate content. The results of these tests were used to evaluate the environmental classification of the structure in accordance with the Florida Department of Transportation (FDOT) Criteria for Substructure Environmental Classifications in Structure Design Guidelines Section 1.3.1. Results of the soil corrosivity test and environmental classification are presented in the following table.

Sample Location	Composite Sample Depth (feet)	Chloride Content (mg/L)	Sulfate Content (mg/L)	pH	Resistivity (ohm-cm)	Environmental Classification (Substructure)	
						Steel	Concrete
TH-1	4½ - 10½	BDL*	BDL*	6.2	3,150	Moderately Aggressive	Slightly Aggressive
TH-2	6 - 11	BDL*	19.5	5.6	5,230	Extremely Aggressive	Moderately Aggressive
Camps Canal	N/A	5	BDL	6.7	15,100	Moderately Aggressive	Slightly Aggressive

*BDL = Below Detectable Limit

6.0 GENERAL SUBSURFACE CONDITIONS

6.1 General Soil Profile

The results of the field exploration and laboratory programs are graphically summarized on the soil boring profiles presented on Figure 3. The stratification of the boring profiles represents our interpretation of the field boring logs and the results of laboratory examinations of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

The results of the borings indicate the following general soil profile:

Depth Below Ground Surface (feet)		Description
From	To	
0	16	Loose fine sand (SP), fine sand with silt (SP-SM), silty fine sand (SM), clayey fine sand (SC) and/or soft sandy clay to clay (CL/CH). Varying amounts of organics
16	32½	Very loose to loose clayey fine sand (SC) and/or very soft to soft sandy clay to clay (CL/CH). Varying amounts of organics and limestone nodules.
32½	37½	Very soft sandy clay to clay (CL/CH) and/or organic clay (OH)
37½	45	Medium dense clayey fine sand (SC) and/or soft sandy clay to clay (CL/CH)

The above soil profile is outlined in general terms only. Please refer to Figure 3 for soil profile details.

6.2 Groundwater Level

An attempt was made to measure the groundwater level in the boreholes during drilling. As shown on Figure 3, groundwater was encountered at a depth of 10.5 feet below the existing ground surface on the date indicated at boring location TH-1. Groundwater was not encountered within the top 10.5 feet and could not be measured below a depth of 10.5 feet at boring location TH-2 due to the mudded condition of the borehole (referenced “GNM” on Figure 3). However, this does not necessarily mean that groundwater would not be encountered within the top 10.5 feet of TH-2 referenced “GNM” at some other time.

Fluctuation in groundwater levels should be anticipated throughout the year primarily due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted.

7.0 ENGINEERING EVALUATION AND RECOMMENDATIONS

7.1 General

The results of our exploration indicate that, with proper site preparation as recommended in this report, the existing soils are suitable for supporting the proposed culvert pipes and headwalls. However, organic laden soils may have been removed under the existing levee, or a portion of the levee, so there is potential for deleterious organic laden soils to exist in some of the proposed construction area within the proposed depth of construction. If organic laden soils are encountered during construction they should be removed entirely from beneath the proposed culverts and/or headwalls plus a horizontal margin equivalent to at least the depth of the organic laden soils beneath the bottom of the culverts and/or headwall footing bottoms.

Clayey sand and sandy clay were encountered in the SPT borings. These clayey soils will be very difficult to moisture condition and compact. Because of potential for seepage and instability, any soils proposed by the contractor to replace in-situ soils that are difficult to compact must be pre-approved by the design engineer.

Very soft to soft clay was encountered in the borings at various depths below the bottom of the proposed culverts and headwall footings. Based on discussion with you and Mr. Cote, we understand that the levee will be reconstructed in the proposed culvert area to similar location, shape and height of the existing levee. Considering the length of time that the existing levee has been in place, the similarly constructed replacement should not add significant new load to the very soft to soft clay, and therefore, should not be subjected to detrimental foundation settlement associated with the very soft to soft clay.

The following are our recommendations for overall site preparation which we feel are best suited for the proposed construction and existing soil conditions. The recommendations are made as a guide for the design engineer, parts of which should be incorporated into the project’s specifications.

7.2 Excavation

Based on the conditions encountered during the field exploration, we anticipate that the majority of the soils as encountered in the borings can be excavated with standard earth moving equipment (i.e.; front-end loaders and backhoes).

The soils below the bottom of the excavation should not be disturbed by the excavation process. If soils become disturbed and difficult to compact, they should be overexcavated to a depth necessary to remove all disturbed soils. Overexcavated areas should be replaced with compacted backfill meeting the “Backfill Requirements” presented in the following report section.

Excavation should be safely braced to prevent injury to personnel or damage to equipment. Temporary safe slopes should be cut in accordance with OSHA, 29 CFR Part 1926 Final Rule, Excavation Requirements or successor regulations. Flatter slopes should be used if deemed necessary. Surcharge loads should be kept at least 5 feet from excavations. Spoil banks adjacent to excavations should be sloped no steeper than 2.0H(horizontal):1.0V(vertical). Provisions for maintaining workers’ safety within excavations is the sole responsibility of the Contractor.

7.3 Backfill Requirements

For backfill required below the bottom of the culvert pipes as needed to replace any excavated disturbed soils and/or backfill used around the culverts and in the levee, we recommend using fine sand with clay or clayey fine sand having a fines content between 8 and 18 percent passing the U.S. Standard No. 200 sieve. Backfill should be placed in lifts not exceeding 12 inches in thickness. Each lift should be compacted to at least 95 percent of the maximum dry density, as determined by the Modified Proctor (ASTM D-1557).

The backfill soil should be of a homogenous nature such that a layer(s) of relatively permeable soil is not placed beneath relatively low permeable soils. This could create undesirable preferential seepage paths through the levee that could cause stability problems.

For backfill soil used adjacent to the proposed headwalls, the following soil unit weight recommendations and earth pressure coefficients are applicable.

Soil Type[1]	Percent Passing the U.S. Standard No. 200 Sieve	Moisture Weight (pcf)	Saturated Weight (pcf)	Angle of Internal Friction[2]	Earth Pressure Coefficients		
					At Rest (K_o)[3]	Active (K_a)[4]	Passive (K_p)[5]
Fine sand with clay (SP-SC) to clayey fine sand (SC)	8 - 18	110	115	30	0.50	0.33	3.00

(1) Unified Soil Classification System.
(2) Reference: after Teng. 1962
(3) $K_0 = 1 – \sin(\Phi)$
(4) $K_a = \tan^2(45 – \Phi/2)$
(5) $K_p = \tan^2(45+ \Phi/2)$

7.4 Pipeline Bedding for Culverts

Pipe bedding foundation soils below the pipes, or below the flowable fill cradle if a cradle is used, should be compacted as necessary to achieve a density equivalent to 95 percent of the maximum dry density, as determined by the Modified Proctor (ASTM D-1557), to a minimum depth of 1 foot below the bottom of the pipe (compact deeper if soils are excavated or disturbed to deeper depths).

Because it is difficult to achieve adequate compaction below the haunches of culvert pipes, it is recommended that a high slump concrete (or “flowable fill” of similar strength) cradle be constructed below the pipe. Consideration should also be given to installing seep shields sized and spaced in accordance with good engineering practices pertinent to the material used for the fill around all culvert pipes penetrating levees. The seep shields should be continuously welded to the pipes and should be embedded in concrete. Where the pipes penetrate a clay core (if a clay core is included in the levee design), one of the seep shields for each pipe should be located within the clay core. It will be necessary to anchor the pipe while the high slump concrete is being placed to prevent the pipe from floating on the concrete.

Pipe bedding foundation soils below the flowable fill cradle should be compacted as necessary to achieve a density equivalent to 95 percent of the maximum dry density, as determined by the Modified Proctor (ASTM D-1557), to a minimum depth of 1 foot below the bottom of the pipe (compact deeper if soils are excavated or disturbed to deeper depths).

A schematic cross-section showing a pipe with a concrete cradle and seepage shield is presented in Appendix III. Because it is still difficult to compact soils adjacent to the pipe above the level of the concrete cradle shown on the schematic and below the centerline of the pipe, many owners choose to allow the concrete cradle to harden, then place additional lifts of flowable fill to a height equivalent to the centerline of the pipe. Typically, compacted soil fill is then placed above the centerline of the pipe.

7.5 Fill Compaction Requirements

The fill alongside and above the concrete cradle/pipes and headwalls must extend all the way to the trench walls and should be placed in level lifts not exceeding 8 inches. Each lift should be compacted to at least 95 percent of the maximum dry density, as determined by the Modified Proctor (ASTM D-1557). Care should be taken not to damage the pipe or defect it by compacting directly above the pipe where there is insufficient cover material present.

The fill soil should be of a homogenous nature such that a layer(s) of relatively permeable soil is not placed beneath relatively low permeable soils. This could create undesirable preferential seepage paths through the levee that could cause stability problems.

A soils engineer or a designated representative from Ardaman & Associates, Inc. should observe and test all prepared and compacted areas to verify that all bedding and fill are prepared and compacted in accordance with the aforementioned specifications.

7.6 Headwall Foundation Support and Foundation Compaction Criteria

Excavate the headwall foundations to the proposed bottom of footing elevations and, thereafter, verify the in-place compaction for a depth of 1 foot below the footing bottoms. If necessary, compact the soils at the bottom of the excavations to at least 95 percent of the modified Proctor maximum dry density (ASTM D-1557) for a depth of 1 foot below the footing bottoms. Based on the existing soil conditions and, assuming the above outlined compaction criteria are implemented, an allowable soil bearing pressure of 1,500 pounds per square foot (psf) may be used in the headwall foundation design. These bearing pressures should result in foundation settlement within tolerable limits (i.e., 2 inches or less).

All bearing foundations should be a minimum of 36 inches wide. A minimum cover of 12 inches should be maintained from the bottom of the foundations to the adjacent finished grades.

In addition to reinforcing steel normally provided near the bottom of the foundation system, negative (top) reinforcing steel should be used.

As noted in the “General” section of this report, clayey soils (like those that will likely be encountered below the bottom of the footings and culvert pipe inverts) may be difficult to compact. Any soils proposed by the contractor to replace in-situ soils that are difficult to compact must be pre-approved by the design engineer.

7.7 Dewatering

The control of the groundwater and surface water will be required to achieve the necessary depths of excavation and subsequent construction and backfilling and compaction requirements presented in the following sections. The actual method(s) of dewatering should be determined by the Contractor, however, regardless of the method(s) used, we suggest drawing down the

water table sufficiently; say 2 to 3 feet, below the bottom of the excavation(s) to preclude "pumping" and/or compaction-related problems with the foundation soils.

The contractor should also be aware that cuts may expose or get very close to confined aquifers where relatively permeable sandy soils underlie less permeable zones of clayey soils. These relatively permeable zones may require dewatering efforts to include relatively deep full aquifer penetrating wells, airlift of water from wells, trench drains, seepage barriers, etc. Typical vacuum-type well points may not be appropriate for dewatering on this project.

8.0 DESIGN SOIL PARAMTERS FOR SHEET PILE DESIGN

We understand that sheet pile walls may be necessary to facilitate the dewatering and subsequent construction relative to the replacement of the culvert pipes. Based on the general soil profile encountered in Borings TH-1 and TH-2, we recommend that the design soil parameters as presented in Table 1 be used for the purposes of design.

Wall friction angles and adhesion values presented in Table 1 assume the use of steel sheet piles. It is noted that the soil parameters presented in Table 1 do not include safety factors. Appropriate safety factors should be applied to the sheet pile design.

9.0 QUALITY ASSURANCE

We recommend establishing a comprehensive quality assurance program to verify that all site preparation, excavation, and backfilling is conducted in accordance with the appropriate plans and specifications. Materials testing and inspection services should be provided by Ardaman & Associates.

As a minimum, an on-site engineering technician should monitor all stripping and grubbing to verify that all deleterious materials have been removed and should observe the proof-rolling operation to verify that the appropriate number of passes are applied to the subgrade. In-situ density tests should be conducted during filling activities and below all excavations to verify that the required densities have been achieved. In-situ density values should be compared to laboratory Proctor moisture-density results for each of the different natural and fill soils encountered.

Finally, we recommend inspecting and testing the construction materials for the structural components.

10.0 CLOSURE

The analyses and recommendations submitted herein are based on the data obtained from the soil borings presented on Figure 3. This report does not reflect any variations which may occur adjacent to or between the borings. The nature and extent of the variations between the borings may not become evident until during construction. If variations then appear evident, it will be

necessary to re-evaluate the recommendations presented in this report after performing on-site observations during the construction period and noting the characteristics of the variations.

In the event any changes occur in the design, nature, or location of the proposed facility, we should review the applicability of conclusions and recommendations in this report. We recommend a general review of final design and specifications by our office to verify that earthwork and foundation recommendations are properly interpreted and implemented in the design specifications. Ardaman and Associates should attend the pre-bid and preconstruction meetings to verify that the bidders/contractor understand the recommendations contained in this report.

This study is based on a relatively shallow exploration and is not intended to be an evaluation for sinkhole potential. This study does not include an evaluation of the environmental (ecological or hazardous/toxic material related) condition of the site and subsurface.

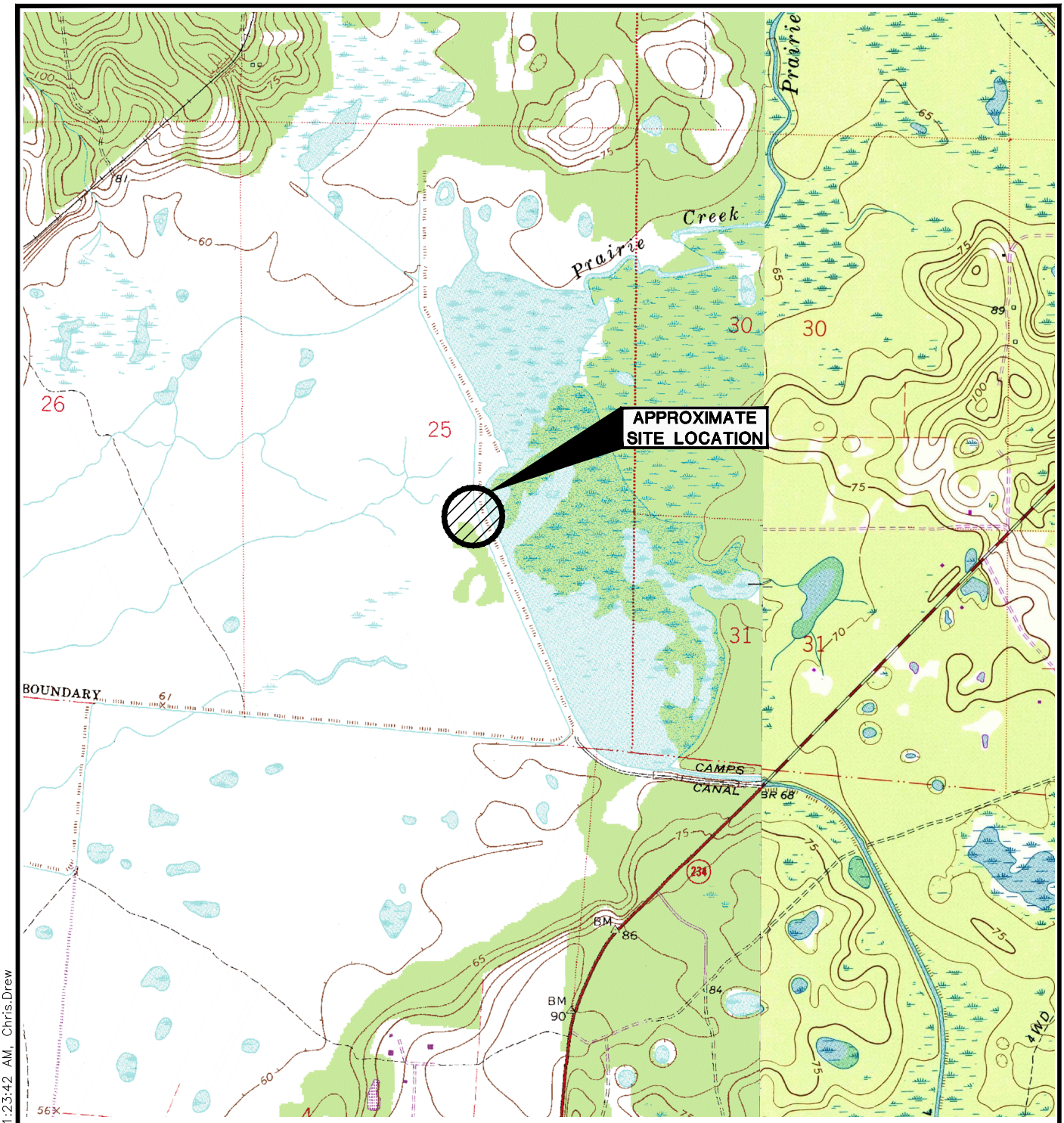
This report has been prepared for the exclusive use of St. Johns River Water Management District in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

TABLE 1

Design Soil Parameters for Sheet Pile Design
at Prairie Creek Diversion Structure Replacement
St. Johns River Water Management District
Alachua County, Florida

Depth Below Existing Ground Surface (feet)	Description[1]	Moist Weight (pcf)	Saturated Weight (pcf)	Angle of Internal Friction[2] (deg)	Cohesion (psf)	Wall Adhesion (psf)	Wall Friction (deg)	Earth Pressure Coefficients		
								At Rest (K_0)[3]	Active (K_a)[4]	Passive (K_p)[5]
0 to 9	Loose fine sand (SP), fines and with silt (SP-SM), silty fine sand (SM), and/or clayey fine sand (SC)	105	110	30	--	--	17	0.50	0.33	3.00
9 to 11	Soft Clay (CL/CH)	100	105	--	250	125	--	1.00	1.00	1.00
11 to 13½	Medium dense fine sand (SP) and/or fine sand with silt (SP-SM)	110	115	31	--	--	17	0.48	0.32	3.12
13½ to 42½	Very soft to soft sandy clay to clay (CL/CH) and/or organic clay (OH)	100	105	--	250	125	--	1.00	1.00	1.00
42½ to 45	Medium dense clayey fine sand (SC)	--	115	31	--	--	17	0.48	0.32	3.12

(1) Unified Soil Classification System (refer to Figure 3).
(2) Reference: after Teng. 1962
(3) $K_0 = 1 - \sin(\Phi)$
(4) $K_a = \tan^2(45 - \Phi/2)$
(5) $K_p = \tan^2(45 + \Phi/2)$



SECTION 25
TOWNSHIP 10 SOUTH
RANGE 20 EAST

OBTAINED FROM U.S.G.S. QUAD MAP: MICANOPY, FLORIDA 1963
(PHOTOREVISED 1988)

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0 1000 2000
SCALE: (FEET)

QUADRANGLE LOCATION

SITE LOCATION MAP

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

SUBSURFACE SOIL EXPLORATION
PRAIRIE CREEK DIVERSION STRUCTURE REPLACEMENT
ALACHUA COUNTY, FLORIDA

DRAWN BY: GC	CHECKED BY:	DATE: 02/06/18
FILE NO. 18-6313	APPROVED BY:	FIGURE: 1

T:\Orlando\18\18-6313\18631301.dwg 2/21/2018 11:23:42 AM, Chris.Drew

LEGEND

TH STANDARD PENETRATION TEST (SPT) BORING LOCATION

NOTE: THE AERIAL PHOTOGRAPHY FOR THE BORING LOCATION PLAN WAS OBTAINED FROM GOOGLE EARTH PRO, DATED 11/19/2016

N

0 50 100

SCALE: (FEET)

BORING LOCATION PLAN

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

SUBSURFACE SOIL EXPLORATION
PRAIRIE CREEK DIVERSION STRUCTURE REPLACEMENT
ALACHUA COUNTY, FLORIDA

DRAWN BY: GC	CHECKED BY:	DATE: 02/06/18
FILE NO. 18-6313	APPROVED BY:	FIGURE: 2

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LEGEND

SOIL DESCRIPTIONS

1. FINE SAND (SP)
2. FINE SAND WITH SILT (SP-SM)
3. SILTY FINE SAND (SM)
4. CLAYEY FINE SAND (SC)
5. SANDY CLAY TO CLAY (CL/CH)
6. ORGANIC CLAY (OH)
7. LIMESTONE

COLORS

- A LIGHT BROWN TO BROWN
- B LIGHT GRAY TO GRAY
- C GREENISH GRAY
- D DARK BROWN OR DARK GRAY
- E VERY DARK BROWN

TH	STANDARD PENETRATION TEST (SPT) BORING
N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT
NM	NATURAL MOISTURE CONTENT IN PERCENT (ASTM D-2216)
-200	PERCENT PASSING NO. 200 SIEVE SIZE (PERCENT FINES)(ASTM D-1140)
OC	ORGANIC CONTENT IN PERCENT (ASTM D-2974)
LL	LIQUID LIMIT (ASTM D-4318)
PI	PLASTICITY INDEX (ASTM D-4318)
←	COMPLETE LOSS OF DRILLING FLUID CIRCULATION
▼	GROUNDWATER LEVEL MEASURED ON DATE DRILLED
WOH	SAMPLER ADVANCED BY STATIC WEIGHT OF HAMMER AND RODS ONLY
GNM	GROUNDWATER NOT MEASURED (i.e., NOT ENCOUNTERED IN THE TOP 10 FEET AND NOT MEASURED BELOW 10 FEET DUE TO THE MUDDED CONDITION OF THE BOREHOLE)
SP,SP-SM SM,SC,CH	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

NOTES:
1. UPON COMPLETION OF EACH SPT BORING, THE BOREHOLE WAS GROUTED WITH CEMENT-BENTONITE SLURRY.
2. ALL SPT BORINGS WERE PERFORMED USING AN AUTOMATIC HAMMER TO THE BORING TERMINATION DEPTH. AUTOMATIC HAMMER N-VALUES MAY BE CONVERTED TO EQUIVALENT SAFETY HAMMER N-VALUES BY MULTIPLYING BY 1.24.

SHELL AND/OR LIMESTONE CONTENT

TRACE: <5%
FEW: 5 TO 10%
LITTLE: 15 TO 25%
SOME: 30 TO 45%
MOSTLY: 50 TO 100%

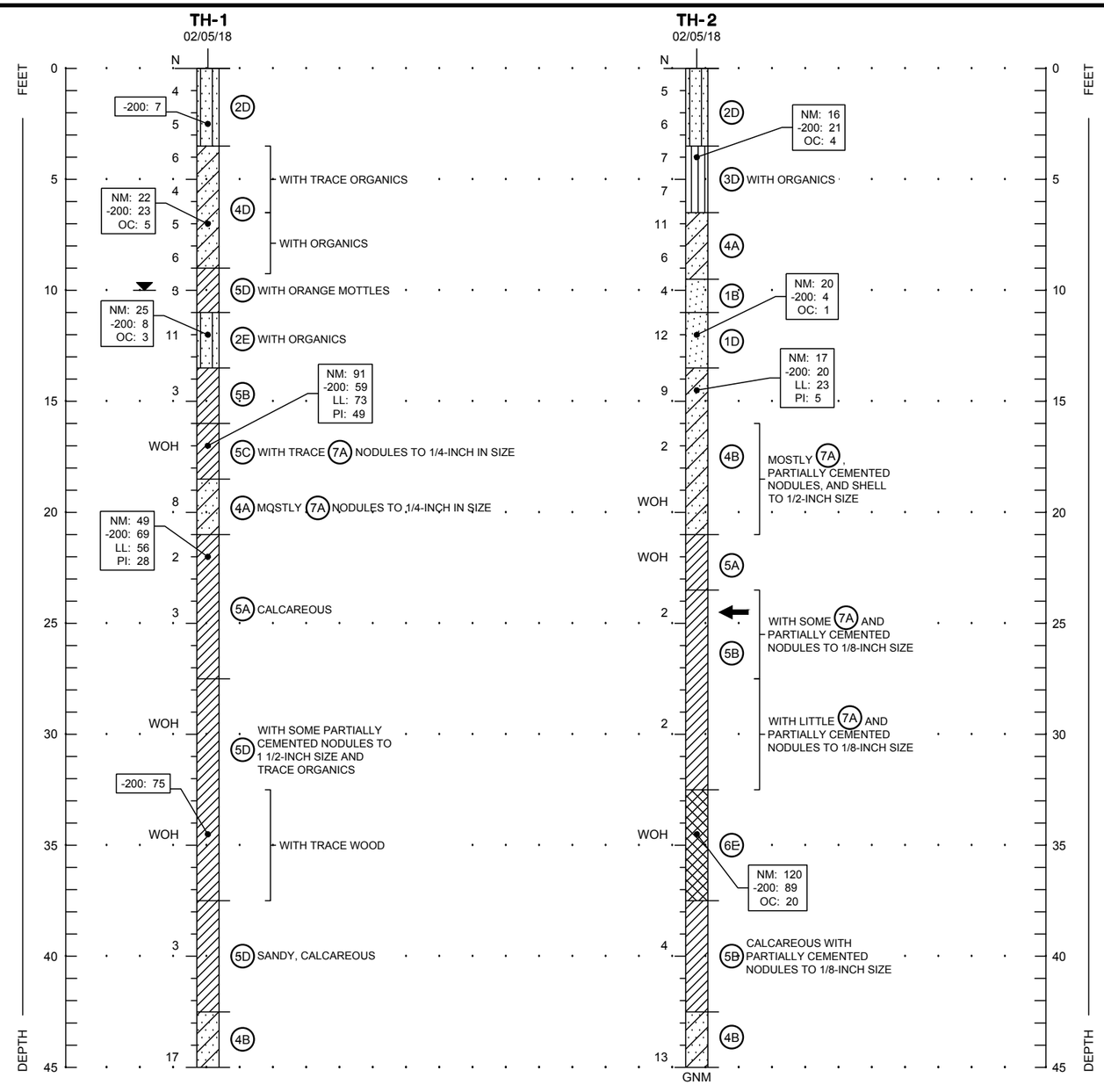
ENGINEERING CLASSIFICATION

I COHESIONLESS SOILS

DESCRIPTION	BLOW COUNT "N"
VERY LOOSE	<4
LOOSE	4 TO 10
MEDIUM DENSE	10 TO 30
DENSE	30 TO 50
VERY DENSE	>50

II COHESIVE SOILS

DESCRIPTION	UNCONFINED COMPRESSIVE STRENGTH, QU, TSF	BLOW COUNT "N"
VERY SOFT	<1/4	<2
SOFT	1/4 TO 1/2	2 TO 4
MEDIUM STIFF	1/2 TO 1	4 TO 8
STIFF	1 TO 2	8 TO 15
VERY STIFF	2 TO 4	15 TO 30
HARD	>4	>30



WHILE THE BORINGS ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS AND FOR THEIR RESPECTIVE VERTICAL REACHES, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTERED. THE BORING LOGS AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SELECTED SAMPLES IN THE LABORATORY. THE DELINEATION BETWEEN SOIL TYPES SHOWN ON THE LOGS IS APPROXIMATE AND THE DESCRIPTION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE DESIGNATED BORING LOCATIONS ON THE PARTICULAR DATE DRILLED.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACES ENCOUNTERED ON THE DATES SHOWN. FLUCTUATIONS IN WATER TABLE LEVELS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR. ABSENCE OF WATER SURFACE DATA IN THE BORING IMPLIES THAT NO GROUNDWATER DATA IS AVAILABLE, BUT DOES NOT NECESSARILY MEAN THAT GROUNDWATER WILL NOT BE ENCOUNTERED AT THIS LOCATION OR WITHIN THE VERTICAL REACHES OF THIS BORING IN THE FUTURE.

SOIL BORING PROFILES

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

SUBSURFACE SOIL EXPLORATION
PRAIRIE CREEK DIVERSION STRUCTURE REPLACEMENT
ALACHUA COUNTY, FLORIDA

DRAWN BY: CD	CHECKED BY:	DATE: 02/13/18
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APPENDIX I

Standard Penetration Test (SPT) Boring Procedure

STANDARD PENETRATION TEST

The standard penetration test is a widely accepted test method of *in situ* testing of foundation soils (ASTM D 1586). A 2-foot long, 2-inch O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each 6 inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load.

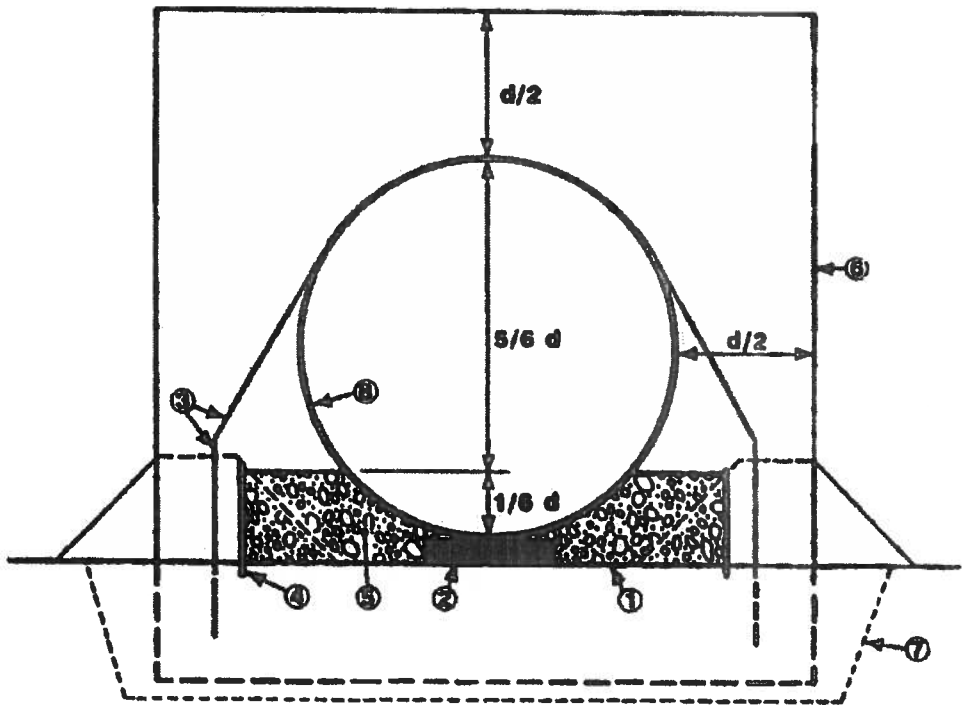
The tests are usually performed at 5-foot intervals. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is a bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, NX-size flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid.

Representative split-spoon samples from the soils are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary. Samples not used in testing are stored for 30 days prior to being discarded.

APPENDIX II

Schematic Cross-Section Example of Culvert Concrete Cradle
and Seepage Shield through Levee

CROSS SECTION
(NOT TO SCALE)



① CLEAN, FIRM, WELL GRADED SURFACE
② PIPE SUPPORT
③ ANCHOR AND STRAP
④ WOOD FORMS (COMPACTED SOIL MOUNDS MAY BE USED)
⑤ 2000 PSI CONCRETE CRADLE
⑥ SEEP SHIELD
⑦ SEEP SHIELD TRENCH (TO BE FILLED WITH CONCRETE)
⑧ CORRUGATED METAL PIPE

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
SIGN-IN SHEET FOR ATTENDEES

IFB # 33711 MANDATORY PRE-BID MEETING

PRAIRIE CREEK DIVERSION STRUCTURE REPLACEMENT

Attendee (Print Legibly): Pam Paulk	Phone: (386) 329-4469	Business Card Provided ☐ Or fill in contact information
Firm Name: SJRWMD		
Address:		
City /State/Zip:		
Bid Documents Picked up today: ◯ Yes or ◯ No	Email: ppaulk@sjrwmd.com	

Attendee (Print Legibly): Amy Wright	Phone: (386) 329-4153	Business Card Provided ☐ Or fill in contact information
Firm Name: SJRMWD		
Address:		
City /State/Zip:		
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Attendee (Print Legibly): Bill Cote	Phone: (386) 329-4109	Business Card Provided ☐ Or fill in contact information
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City /State/Zip:		
Bid Documents Picked up today: ◯ Yes or ◯ No	Email: WCOTE@SJRWMD.COM	

Attendee (Print Legibly): JD Orta	Phone: (904) 219-4793	Business Card Provided ☑ Or fill in contact information
Firm Name: Westwind Contracting		
Address: 3799 W. Hallandale Beach Blvd.		
City /State/Zip: Pembroke Park, FL. 33023		
Bid Documents Picked up today: ◯ Yes or ◯ No	Email: JDO@WestwindContracting.com	

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IFB # 33711 **MANDATORY PRE-BID MEETING**

PRAIRIE CREEK DIVERSION STRUCTURE REPLACEMENT

Attendee (Print Legibly):	Phone:	Business Card Provided ☐ Or fill in contact information
WALDY POLIZZI	954. 275. 4576	
Firm Name: WESTWIND CONTRACTING, INC		
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Attendee (Print Legibly):	Phone:	Business Card Provided ☑ Or fill in contact information
Greg Sutfin	352-840-0161	
Firm Name: Commercial Industrial Corp		
Address: 186 NW 68th Ave		
City /State/Zip: Ocala, FL 34482		
Bid Documents Picked up today: ○ Yes or ☒ No	Email: JAY@CICFL.COM	

Attendee (Print Legibly):	Phone:	Business Card Provided ☑ Or fill in contact information
Jim Hennigar	561-469-1622	
Firm Name: Douglas N. Higgins, Inc.		
Address: 4880 Donald Ross Road, Suite 200		
City /State/Zip: Palm Beach Gardens, FL 33418		
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Attendee (Print Legibly):	Phone:	Business Card Provided ☐ Or fill in contact information
Donald Forgione		
Firm Name: Jones Prairie State Park		
Address: 100 Savanah Blvd		
City /State/Zip: Micanopy FL		
Bid Documents Picked up today: ○ Yes or ○ No	Email: DONALD.FORGIONE@DEP.FH.STATE.US	

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IFB # 33711 MANDATORY PRE-BID MEETING

PRAIRIE CREEK DIVERSION STRUCTURE REPLACEMENT

Attendee (Print Legibly): GEORGE PAPPAS	Phone: 727-940-5395	Business Card Provided ☑ Or fill in contact information
Firm Name: SOUTHERN ROAD & BRIDGE LLC		
Address: 715 ~~[illegible]~~ WESLEY AV		
City /State/Zip: TARPON SPRINGS, FL		
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Attendee (Print Legibly): GENE ARNOLD	Phone: 352 495 9494	Business Card Provided ☑ Or fill in contact information
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Attendee (Print Legibly): ED KINLEY	Phone: 813-390-0659	Business Card Provided ☑ Or fill in contact information
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City /State/Zip: Tampa/FL./33675		
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Attendee (Print Legibly): Brett Dickman	Phone: 772-905-7300	Business Card Provided ☐ Or fill in contact information
Firm Name: Brothers Construction Inc.		
Address: 6526 S Kanner Hwy 345		
City /State/Zip: Stuart FL 34997		
Bid Documents Picked up today: ○ Yes or ⊗ No	Email: Lyza@BrothersConstructionFL.com	

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PRAIRIE CREEK DIVERSION STRUCTURE REPLACEMENT

Attendee (Print Legibly): Sarah Oliver	Phone: 3864466444	Business Card Provided ☐ Or fill in contact information
Firm Name: S. E. Cline Construction		
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City /State/Zip: Palm Coast FL 32137		
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Attendee (Print Legibly): Randal Bazemore	Phone: 772-201-0545	Business Card Provided ☑ Or fill in contact information
Firm Name: underwater Engineering Services		
Address: 3306 Enterprise Rd FT. Pierce, FL 34982		
City /State/Zip: FT Pierce		
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Attendee (Print Legibly): STEVE HALL	Phone: 850-766-9330	Business Card Provided ☒ Or fill in contact information
Firm Name: HYDRA ENGINEERING & CONSTRUCTION		
Address: 36 JASPER THOMAS ROAD		
City /State/Zip: CRAWFORDVILLE, FLA 32327		
Bid Documents Picked up today: ○ Yes or ☒ No	Email: Steve@hydraec.com	

Attendee (Print Legibly): LINDSEY BUCHANAN	Phone: 407-282-5340	Business Card Provided ☐ Or fill in contact information
Firm Name: CONSTRUCT CO INC.		
Address: 1510 E COLONIAL DR., STE 300		
City /State/Zip: ORLANDO, FL 32803		
Bid Documents Picked up today: ◐ Yes or ○ No	Email: INFO@CONSTRUCTCO-INC.COM	