



ADDENDUM NO. 2

Issue Date: June 30, 2020

Project Name: Moorhen Marsh Low Energy Aquatic Plant System

Bid Number: 2020030

Bid Opening Date: **July 14, 2020**

This addendum is being released to modify bid documents and to answer questions received to date.

The information and documents contained in this addendum are hereby incorporated in the invitation to bid. **This addendum must be acknowledged where indicated on the bid form, or the bid will be declared non-responsive.**

Questions and Answers:

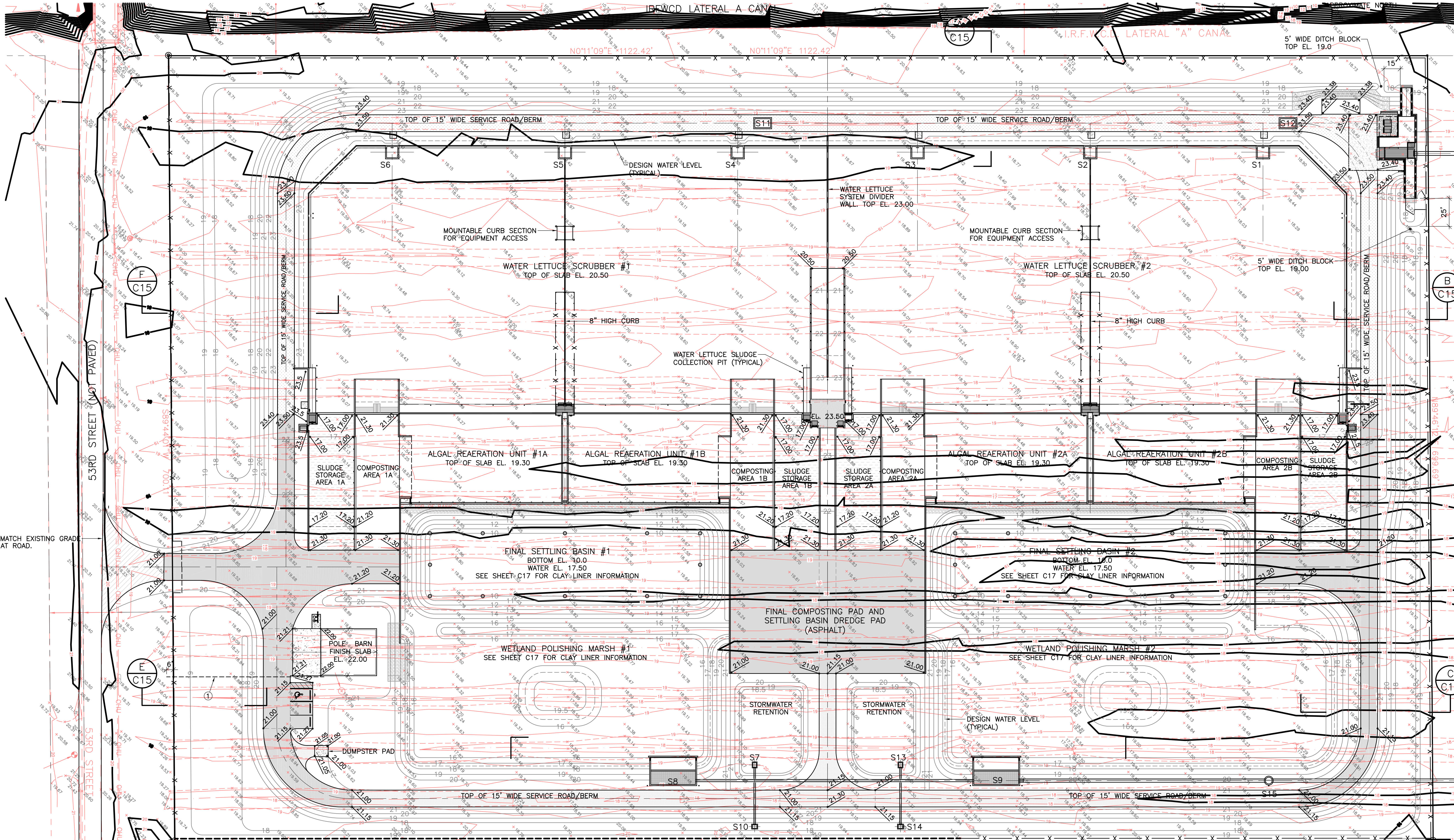
1. Is FPL installing the Primary conduits? If not please provide what they require at each location.
Response: FPL is installing the Primary conduits and the contractor must coordinate with FPL to accomplish this. The electrical drawings provide enough information for the contractor to coordinate with FPL to deliver the electrical service. All FPL charges for this work will be paid by the OWNER. Keynotes 3 and 4 on Sheet E1 (attached) have been updated to clarify this. Also, Wiring Methods & Materials Note 4 on Sheet E4 (attached) has been revised to clarify this. The contractor and/or FPL will be required to obtain all necessary permits from Indian River County to cross 66th Avenue, and from Indian River Farms Water Control District to cross Lateral A Canal. The OWNER will pay all permit fees.
2. I do not see the height of fixture type S1 – pole fixture.
Response: The pole is 12' tall.
3. Please verify the PCP panel that is provided by others will be service rated.
Response: Yes, it will be service rated.
4. In section 2.3 of page 11300-12 the motor starters for the pump control panel are listed as “solid state motor controllers equal to Allen-Bradley Bulletin 150 SMC Plus...” During the design phase, we had discussed the possibility of using VFD motor starters, can you please confirm that VFDs will not be required?
Response: Replace paragraph 2.3.A in its entirety with the following: “The Motor Starters shall be variable speed Motor Controllers equal to Danfoss Aquavar IP20.” Section 11300 has been revised accordingly and is attached.

Modifications to Bidding Documents:

1. 140 LF of empty 2" Sch. 80 PVC electrical conduit has been added from the pole barn to six feet outside 53rd Street right-of-way. Refer to revised Drawings C2a, C2b, and C10, attached. Also attached is revised Section 00310 - Bid Form and Section 01025 – Measurement and Payment, both revised to include the conduit.
2. Receptacle pedestals on home run labels were missing on Drawing E2 – Electrical Site Details. Drawing E2 has been updated to show an arrow at the receptacle with the conduit and wire size and the revised Drawing is attached.
3. The following language has been added to Section 11300 – Submersible Pumps and Appurtenances for Headworks, paragraph 2.4.C: “1. Panel supplier at a minimum shall supply a service rated main breaker control panel that not only supplies the control power and pumps, but also additional distribution for the 5kVA distribution transformer and the rake system per the one-line and panel schedule from the electrical drawings E-4. The main breaker shall also interlock with a 100A generator back-feed breaker. 2. Supply an electrical one-line drawing with ladder logic to be reviewed and approved by the OWNER.” The revised section is attached.
4. Pay attention to Section 02225 – “Erosion Control and Treatment of Dewatering Water and Stormwater from the Construction Site” regarding offsite discharge of dewatering water and stormwater. Contact Mr. David Gunter, Indian River Farms Water Control District (IRFWCD) Superintendent, (772-562-2141), regarding IRFWCD requirements to discharge water into surrounding canals.

Attachments:

Revised Drawing C2a – Site Grading With Existing Topography
Revised Drawing C2b – Site Grading Without Existing Topography
Revised Drawing C10 – Parking and Pole Barn Area
Revised Section 00310 – Bid Form – Addendum 2
Revised Section 01025 – Measurement and Payment – Addendum 2
Revised Section 11300 - Submersible Pumps and Appurtenances for Headworks – Addendum 2
Revised Drawing E1 – Electrical Site
Revised Drawing E2 – Electrical Site Details
Revised Drawing E4 – Electrical Schedules, Notes, One-Line



140' LF OF 2" SCH. 80 PVC ELECTRICAL CONDUIT FOR FUTURE FIBER OPTIC CABLE. CAP SOUTH END AND DRIVE 2"x4" MARKER POST AT END AND PAINT POST RED. BURY CONDUIT 36" TO TOP OF PIPE FROM FINISH GRADE. EXTEND NORTH END AT POLE BARN TO 2' ABOVE GRADE USING LONG SWEEP BENDS AND CAP END. LAY DETECTABLE WARNING TAPE 12" ABOVE TOP OF BURIED CONDUIT. WARNING TAPE TO BE PRINTED "BURIED FIBER OPTIC" OR SIMILAR.

NOT VALID FOR CONSTRUCTION UNLESS ORIGINALLY SIGNED AND SEALED

NAVD88 DATUM IS USED FOR ALL ELEVATIONS ON THIS PROJECT.

NOT FOR CONSTRUCTION: BIDDING PURPOSES ONLY

INDIAN RIVER COUNTY STORMWATER DIVISION 1801 27TH STREET VERO BEACH, FLORIDA 32960 (772) 226-1562			
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY
KM	KM	KM	KM

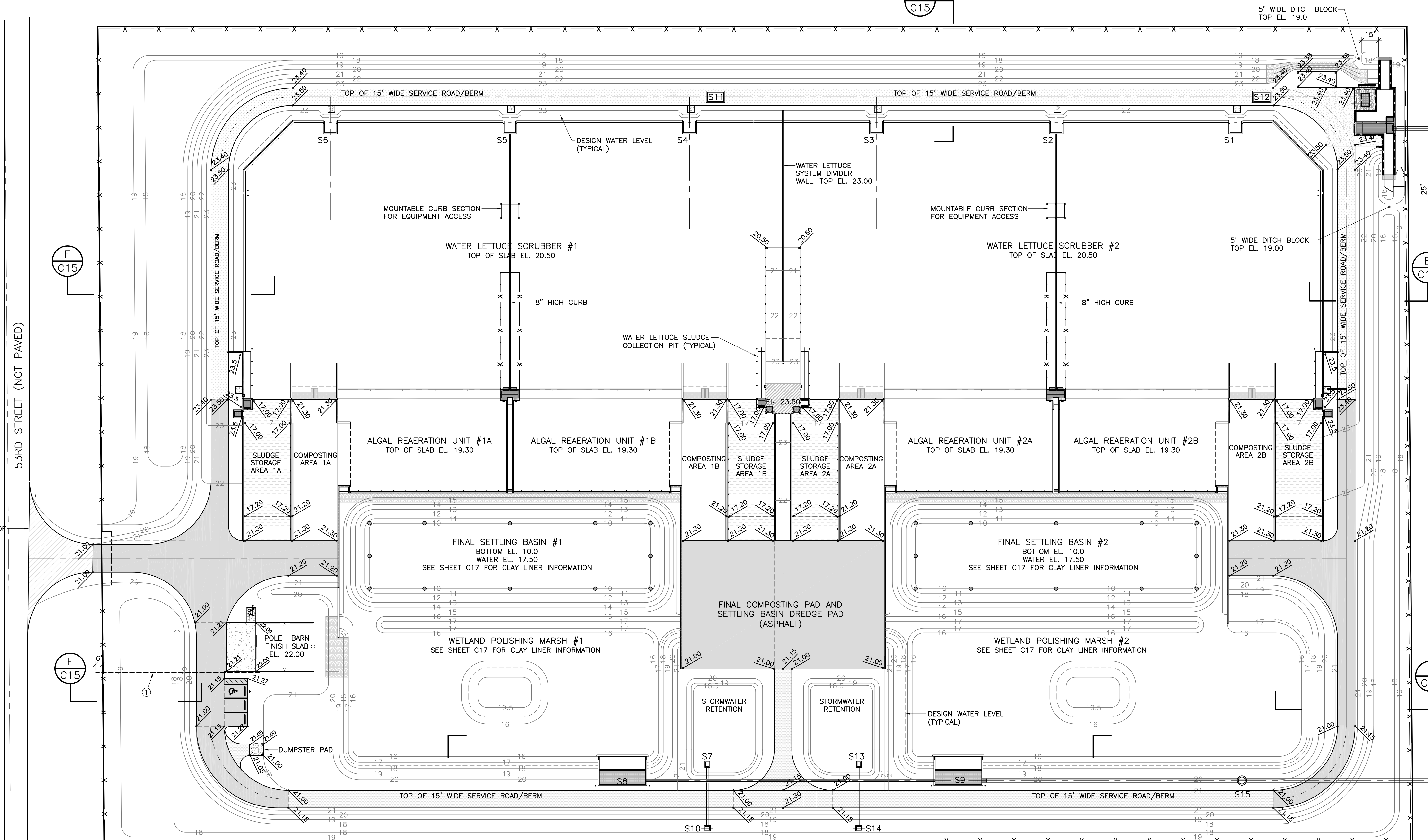
MOORHEN MARSH LEAPS™

W. KEITH McCULLY, P.E.
FLORIDA P.E. NO. 32007
DATE:

SITE GRADING WITH EXISTING TOPOGRAPHY

PROJECT NO.
DATE 6/26/2020
SCALE 1"=40'
SHEET C2a

IRFWCD LATERAL A CANAL



① 140' LF OF 2" SCH. 80 PVC ELECTRICAL CONDUIT FOR FUTURE FIBER OPTIC CABLE. CAP SOUTH END AND DRIVE 2"x4" MARKER POST AT END AND PAINT POST RED. BURY CONDUIT 36" TO TOP OF PIPE FROM FINISH GRADE. EXTEND NORTH END AT POLE BARN TO 2' ABOVE GRADE USING LONG SWEEP BENDS AND CAP END. LAY DETECTABLE WARNING TAPE 12" ABOVE TOP OF BURIED CONDUIT. WARNING TAPE TO BE PRINTED "BURIED FIBER OPTIC" OR SIMILAR.

D
C15

D
C15

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DESIGNED BY	KM	DRAWN BY	KM	CHECKED BY	KM	APPROVED BY	KM
NUMBER	REVISIONS	REVISED BY	CHECKED BY	DESIGNED BY	KM	DRAWN BY	KM

INDIAN RIVER COUNTY
STORMWATER DIVISION
1801 27TH STREET
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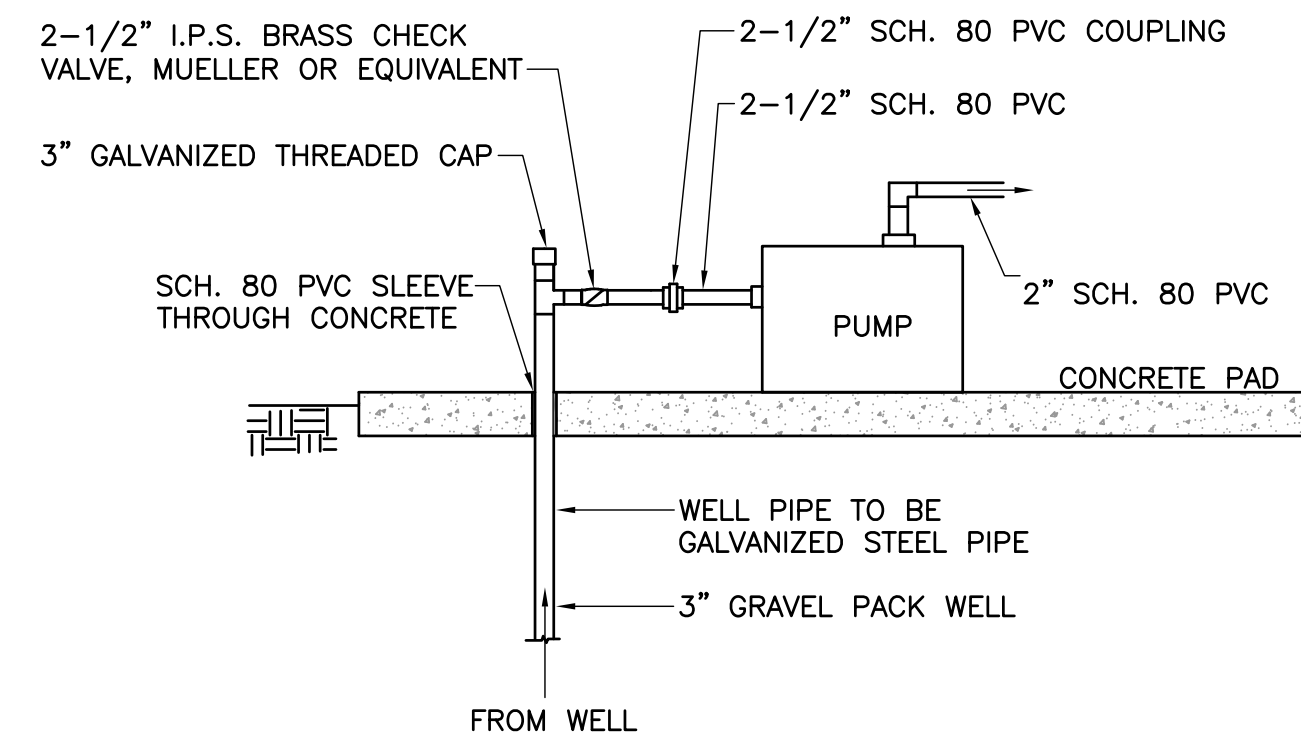
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W. KEITH McCULLY, P.E.
FLORIDA P.E. NO. 32007
DATE:

SITE GRADING WITHOUT
EXISTING TOPOGRAPHY

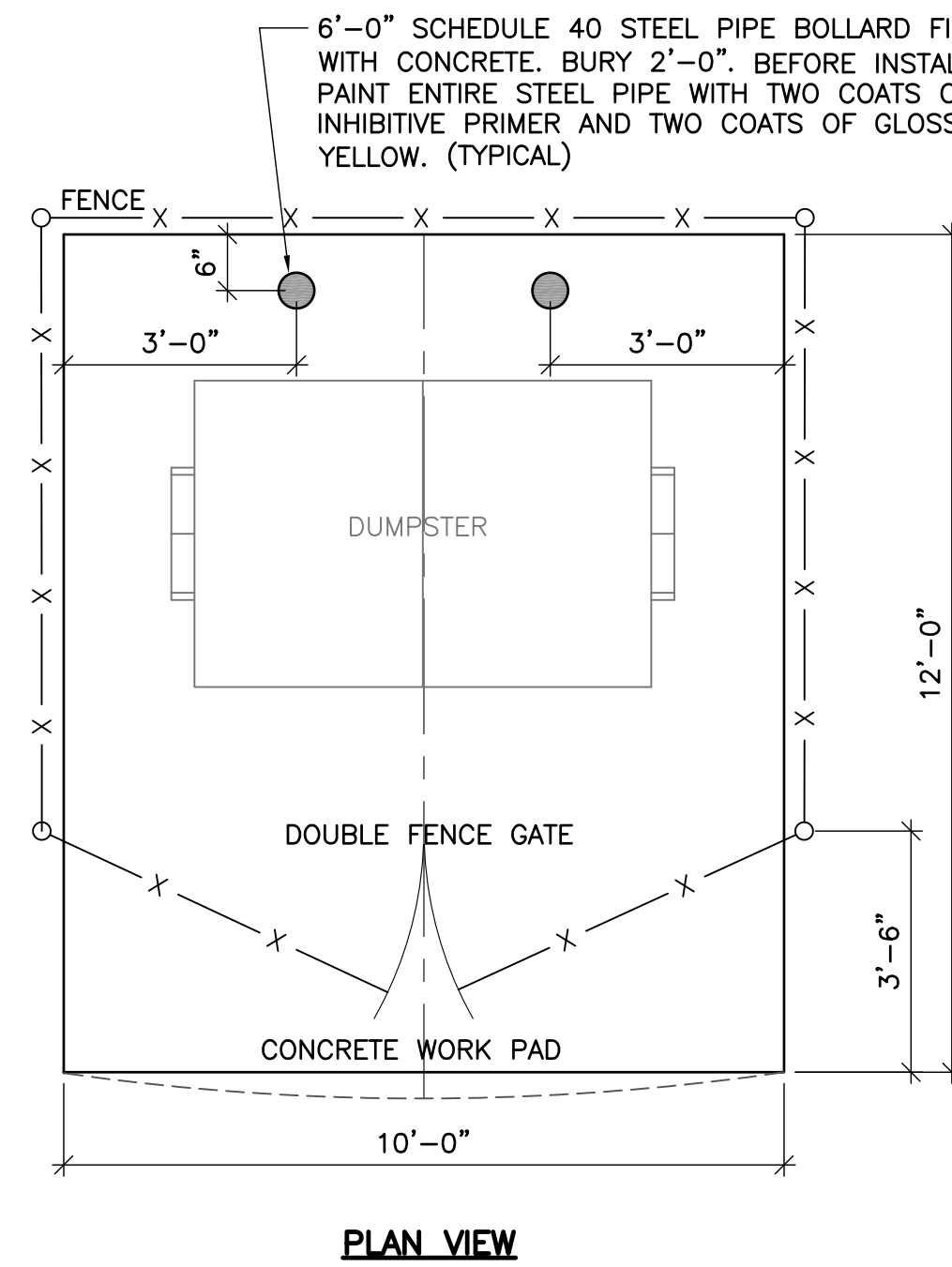
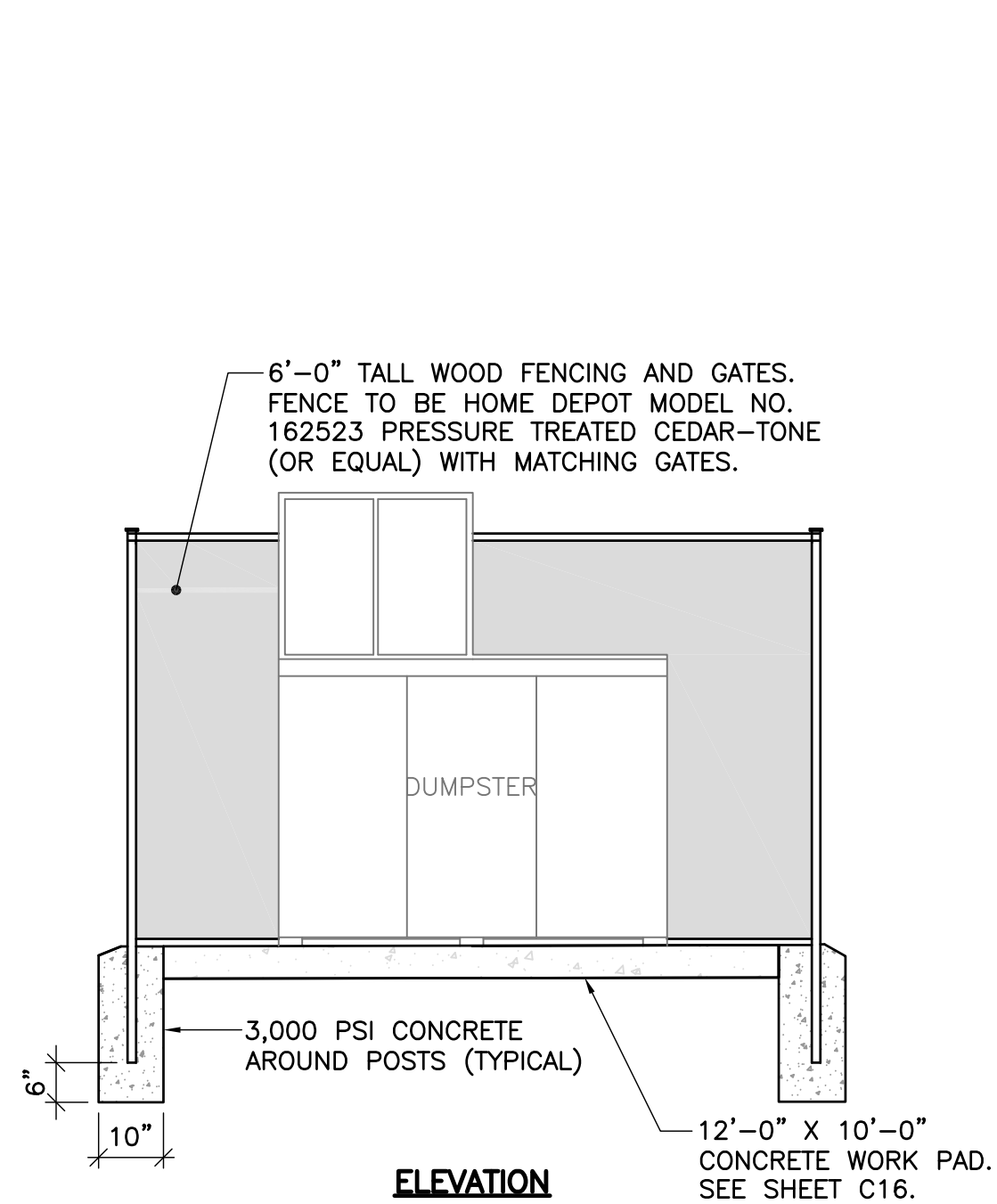
PROJECT NO.
DATE 6/26/2020
SCALE 1"=40'
SHEET C2b



1 DETAIL: NONPOTABLE WATER WELL, PUMP, AND NOTES
 C10 NOT TO SCALE

NONPOTABLE WATER SYSTEM NOTES:

1. PUMP = GOULDS PRIMELINE SP MODEL 30SPM3 OR APPROVED EQUAL.
2. THE TWO DIAPHRAM TANKS ARE GOULDS V350 HYDRO-PRO DIAPHRAM TANKS OR APPROVED EQUAL.
3. THE PUMP ON/OFF SWITCH SHALL BE SET FOR 40/60 PSIG
4. REDUCE 2" SCH. 80 PIPE TO 1" AT HOSE BIB AND PROVIDE 1" BRASS HOSE BIB WITH LEVER HANDLE.
5. FURNISH 75 FEET OF 1" DIAMETER FLEXIBLE INDUSTRIAL GRADE HOSE WITH INDUSTRIAL GRADE BRASS ADJUSTABLE SPRAY NOZZLE.
6. CONSTRUCT WELL TO SUFFICIENT DEPTH SO THAT THE WELL WATER IS SUITABLE FOR EQUIPMENT WASHDOWN WITH NO ADDITIONAL TREATMENT, LEAVING NO RUST STAIN OR OTHER RESIDUE/FILM. WELL DEPTH NOT MEETING THIS CRITERIA SHALL BE ADJUSTED TO A DEPTH THAT PROVIDES GOOD QUALITY WASHDOWN WATER AT NO ADDITIONAL EXPENSE TO OWNER.



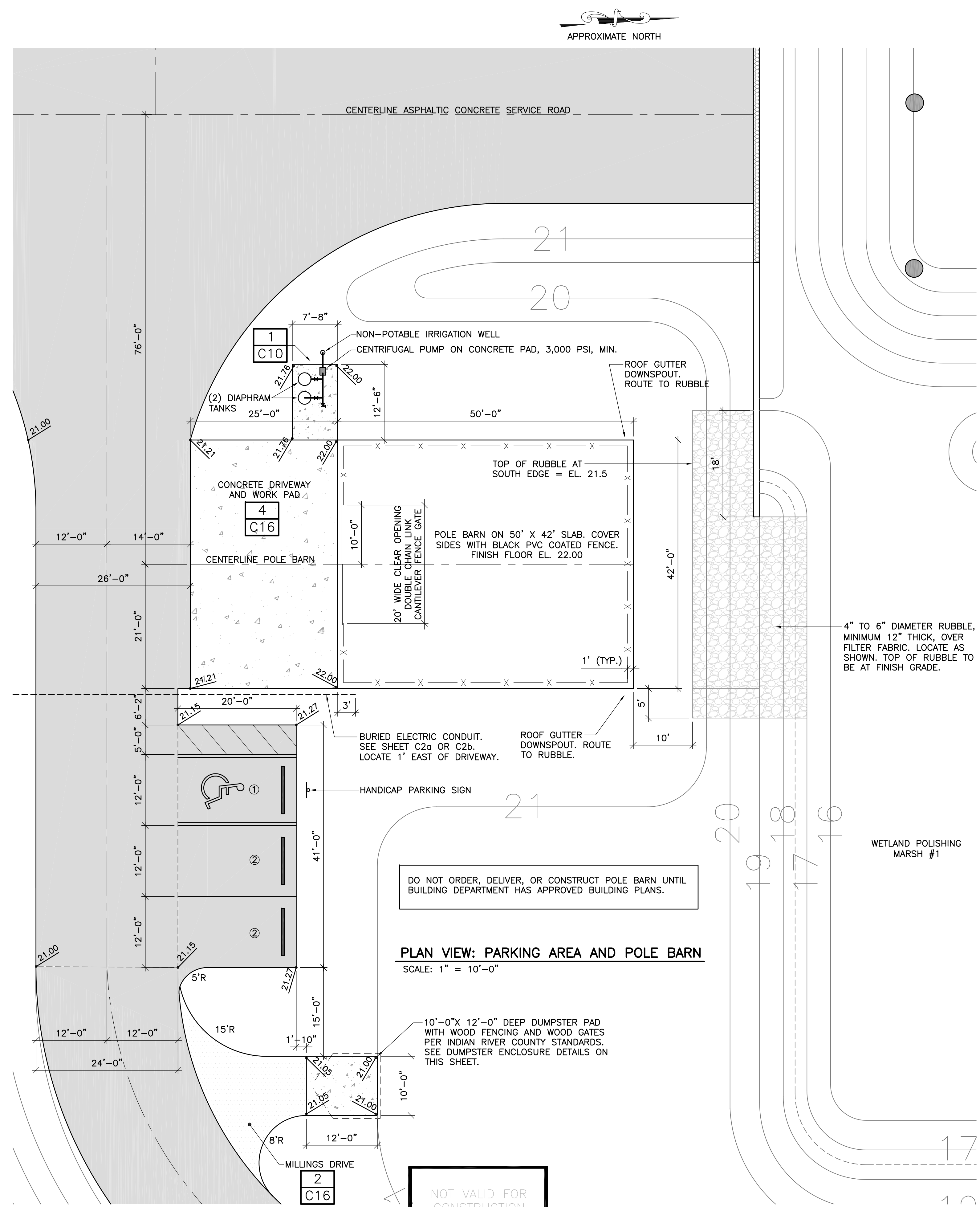
DETAILS: DUMPSTER ENCLOSURE AND PAD
 NOT TO SCALE

PARKING LEGEND

- ① HANDICAP PARKING SPACE. PROPERLY SIGN (FTP-21-06 AND FTP-22-06), MARK, AND STRIPE IN ACCORDANCE WITH THE FDOT FY 2018-19 STANDARD PLANS, INDEX 711-001, SHEET 13 OF 14.
- ② 12' x 20' PARKING STALL PER INDIAN RIVER COUNTY SPECIFICATIONS. STRIPE IN WHITE RETRO-REFLECTIVE TRAFFIC PAINT PER FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 710, LATEST EDITION.

PARKING STALL NOTES

1. ALL PARKING SPACES, WITH THE EXCEPTION OF THE HANDICAPPED PARKING SPACE, SHALL BE STRIPED IN WHITE, RETRO-REFLECTIVE TRAFFIC PAINT AND SHALL BE IN ACCORDANCE WITH THE FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, SECTION 710.
2. PARKING STALL WIDTHS SHALL BE DIMENSIONED FROM CENTERLINE TO CENTERLINE OF THE WHITE STRIPES. THIS APPLIES TO HANDICAP PARKING STALLS ALSO.



PLAN VIEW: PARKING AREA AND POLE BARN
 SCALE: 1" = 10'-0"

DO NOT ORDER, DELIVER, OR CONSTRUCT POLE BARN UNTIL BUILDING DEPARTMENT HAS APPROVED BUILDING PLANS.

10'-0" X 12'-0" DEEP DUMPSTER PAD WITH WOOD FENCING AND WOOD GATES PER INDIAN RIVER COUNTY STANDARDS. SEE DUMPSTER ENCLOSURE DETAILS ON THIS SHEET.

NOT FOR CONSTRUCTION:
 BIDDING PURPOSES ONLY

DESIGNED BY	KM	DRAWN BY	KM	CHECKED BY	KM	APPROVED BY	KM
NUMBER	REVISIONS	REVISED BY	CHECKED BY	DESIGNED BY	KM	DRAWN BY	KM

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 STORMWATER DIVISION
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W. KEITH McCULLY, P.E.
 FLORIDA P.E. NO. 32007
 DATE:

PARKING AND POLE
 BARN AREA

PROJECT NO.	
DATE	6/26/2020
SCALE	AS NOTED
SHEET	C10

CONTRACTOR's NAME: _____

SECTION 00310 – BID FORM – ADDENDUM 2

PROJECT IDENTIFICATION:

Project Name: **MOORHEN MARSH LOW ENERGY AQUATIC PLANT SYSTEM**
Bid Number: 2020030
Project Address: 6520 53rd Street, Vero Beach, Florida 32967.
Project Summary: Construction of a regional stormwater treatment facility that will remove pollutants from North Relief Canal water.

THIS BID IS SUBMITTED TO: INDIAN RIVER COUNTY
PURCHASING DIVISION
1800 27th Street, Building B
VERO BEACH, FLORIDA 32960

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with all other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.

3.01 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

<u>Addendum Date</u>	<u>Addendum Number</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition, if any, which have been identified in the General

CONTRACTOR's NAME: _____

Conditions.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

I. Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to Bidder.

J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.01 Bidder shall complete the Work in accordance with the Contract Documents for the price(s) contained in the Bid Schedule:

A. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

B. The OWNER reserves the right to omit or add to the construction of any portion or portions of the work heretofore enumerated or shown on the plans. Furthermore, the OWNER reserves the right to omit in its entirety, any one or more items of the Contract without forfeiture of Contract or claims for loss of anticipated profits or any claims by the Contractor on account of such omissions.

CONTRACTOR's NAME: _____

- C. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided. The quantities actually required to complete the contract and work may be less or more than so estimated, and, if so, no action for damages or for loss of profits shall accrue to the CONTRACTOR by reason thereof.
- D. Unit Prices have been computed in accordance with paragraph 11.03.B of the General Conditions (and Supplementary Conditions if applicable).
- E. If Bidder believes that the cost of any item of the Work has not been established by the Bid Form, then Bidder shall include that cost in some other applicable bid item, so that Bidder's proposal for the project reflects Bidder's total price for completing the Work in its entirety.

6.01 Bidder agrees that the Work will be completed and ready for final payment in accordance with paragraph 14.07.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified, which shall be stated in the Agreement.

7.01 The following documents are attached to and made a condition of this Bid:

- A. Required Bid security in the form of _____;
- B. Section 00450– Bidder's Qualification Form and Questionnaire;
- C. Section 00452 - Sworn Statement under Section 105.08, Indian River County Code, on Disclosure of Relationships;
- D. Section 00454 - Sworn Statement Under the Florida Trench Safety Act;
- E. Section 00458 - List of Subcontractors; and
- F. Section 00459 – Drug-Free Workplace Certification
- G. (List other documents as pertinent).

8.01 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders and Section 00700 General Conditions.

9.01 By signing this form, Bidder acknowledges that it has read and understood all information contained herein.

SUBMITTED on _____, 20____.

State Contractor License No. _____

CONTRACTOR's NAME: _____

REFER TO THE TABULAR BID FORM AT THE END OF THIS SECTION (3 PAGES)

If Bidder is:

An Individual:

Name (typed or printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as: _____

Business address: _____

Phone No.: _____ FAX No.: _____

A Partnership:

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

Phone No.: _____ FAX No.: _____

A Corporation:

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____ (CORPORATE SEAL)

Attest _____
(Signature of Corporate Secretary)

Business address: _____

Phone No.: _____ FAX No.: _____

Date of Qualification to do business is _____.

CONTRACTOR's NAME: _____

A Joint Venture:

Joint Venture Name: _____ (SEAL)

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Joint Venture Name: _____ (SEAL)

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Phone and FAX Number, and Address for receipt of official communications:

(Each joint venturor must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

* * END OF SECTION * *

CONTRACTOR'S NAME: _____

MOORHEN MARSH LOW ENERGY AQUATIC PLANT SYSTEM BID FORM - ADDENDUM NO. 2

Item	Description	Quantity	Unit	Unit Price	Amount
PART A OF THE CONTRACT					
1.00	GENERAL ITEMS				
1.01	Mobilization/Demobilization	1	LS		
1.02	Maintenance of Traffic	1	LS		
1.03	Project Record Documents	1	LS		
1.04	Public Construction Bond	1	LS		
1.05	Construction Photographs	1	LS		
1.06	Insurance Coverage	1	LS		
1.07	Engineer's and Contractor's Field Office	1	LS		
SUBTOTAL PART 1 - GENERAL ITEMS					
2.00	SITE WORK				
2.01	Wildlife and Erosion Control Silt Fencing	1	LS		
2.02	Clear and Grub (including demolitions) including hauling material offsite for disposal	1	LS		
2.03	Monitoring existing structures per Section 02220, paragraph 3.15	1	LS		
2.04	Dewatering	1	LS		
2.05	Grade all areas not included in other pay items	1	LS		
2.06	Type B chain link perimeter fencing with 3-strand barb wire	2,863	LF		
2.07	46' wide two-piece cantilevered chain link fence gate with 3-strand barb wire at site entrance	1	Each		
2.08	24' wide two-piece cantilevered chain link fence gate with 3-strand barb wire at site entrance	1	Each		
2.09	Type B chain link perimeter fencing with no barb wire	22	LF		
2.10	8' wide single chain link fence gate with no barb wire	1	Each		
2.11	12" thick cemented coquina shell driving surface at 53rd Street entrance	291	SY		
2.12	12" thick Type B stabilized subgrade below cemented coquina shell driving surface at 53rd Street	306	SY		
2.13	2" thick Type SP-12.5 asphalt concrete pavement	4,788	SY		
2.14	8" thick cemented coquina shell base below asphalt pavement	5,027	SY		
2.15	12" thick Type B stabilized subgrade below asphalt pavement	5,279	SY		
2.16	Minimum 8" thick asphalt millings drives, including stabilized subgrade and filter fabric	1,638	SY		
2.17	Grass Surface Service Road (not including hydroseeding)	2,294	SY		
2.18	Stop sign at 53rd Street	1	Each		
2.19	Painting parking lot area stripes with thermoplastic paint, including all required handicap parking painting	1	LS		
2.20	Handicap Parking Sign	1	Each		
2.21	Concrete tire stops	3	Each		
2.22	Pole Barn	1	LS		
2.23	Pole Barn concrete slab	233.33	SY		
2.24	Pole Barn concrete driveway	116.67	SY		
2.25	Dumpster pad with fence and gate per details on Sheet C10	1	LS		
2.26	Minimum 8" thick asphalt millings drive for dumpster pad, including stabilized subgrade and filter fabric	31	SY		
2.27	Non-potable irrigation well, centrifugal pump, concrete pad, and piping as shown on Sheet C10 and as specified.	1	LS		
2.28	Influent pipe connection (North Relief Canal to Headworks Structure)	1	LS		
2.29	Effluent pipe connection (Structure S15 to North Relief Canal)	1	LS		
2.30	Headworks Structure	1	LS		
2.31	"L" shaped concrete Work Slab abutting Headworks Structure	1	LS		
2.32	Primary Influent Screen and Controls	1	LS		
2.33	Influent Pumps and Pump Controls	1	LS		
2.34	Slide Gate No. 7 (for Headworks Structure influent piping)	1	Each		
2.35	Headworks area discharge piping, valves, fittings, etc. from (and including) Bends #8 and #21 to (and including) Bend #19, as shown on Sheet PS1.	1	LS		

CONTRACTOR'S NAME: _____

2.36	Water Lettuce Scrubber force main and distribution header piping system	1	LS		
2.37	Flow Meter No. 1	1	LS		
2.38	Flow Meter No. 2	1	LS		
2.39	Structure S11	1	LS		
2.40	Structure S12	1	LS		
2.41	Structure S11 and S12 Sump Pumps	2	Each		
2.42	Structures S1 through S6	6	Each		
2.43	Primary Treatment Units including all associated grating, handrails, appurtenances, etc.				
a.	Water Lettuce Scrubbers 1 and 2	1	LS		
b.	Water Lettuce Scrubber 1A/1B Dewatering Flume	1	LS		
c.	Water Lettuce Scrubber 2A/2B Dewatering Flume	1	LS		
d.	Algal Reaeration Unit 1A	1	LS		
e.	Algal Reaeration Unit 1B	1	LS		
f.	Algal Reaeration Unit 2A	1	LS		
g.	Algal Reaeration Unit 2B	1	LS		
h.	Sludge Storage Area 1A and Composting Area 1A	1	LS		
i.	Sludge Storage Area 1B and Composting Area 1B	1	LS		
j.	Sludge Storage Area 2A and Composting Area 2A	1	LS		
k.	Sludge Storage Area 2B and Composting Area 2B	1	LS		
l.	Water Lettuce Scrubber Access Ramp	1	LS		
m.	Walls for Final Settling Basins 1 and 2	1	LS		
2.44	4" DIP water lettuce sludge supernatant force main from Sludge Storage Area #1A	168	LF		
2.45	4" DIP water lettuce sludge supernatant force main from Sludge Storage Area #2B	168	LF		
2.46	Final Settling Basin #1 and Wetland Polishing Marsh #1, including GCL.	1	LS		
2.47	Final Settling Basin #1 and Wetland Polishing Marsh #1, including GCL.	1	LS		
2.48	Rubble Riprap at southwest corner of Wetland Polishing Marsh #1	1	LS		
2.49	Structure S8	1	Each		
2.50	Structure S9	1	Each		
2.51	Structures S7 and S13	2	Each		
2.52	Structures S10 and S14	2	Each		
2.53	18" RCP between Structures S7 and S10	1	LS		
2.54	18" RCP between Structures S13 and S14	1	LS		
2.55	Tideflex inline check valve at Structure S9 discharge	1	Each		
2.56	24" RCP between Structures S8 and S9	248	LF		
2.57	36" PVC between Structures S9 and S15	220	LF		
2.58	Structure S15	1	Each		
2.59	Site Electric	1	LS		
2.60	Portable Water Lettuce Supernatant/Sludge Pump	1	Each		
2.61	Portable Eyewash Station	1	Each		
2.62	Safety Equipment	1	LS		
2.63	White solid PVC/Vinyl privacy perimeter fence	700	LF		
2.64	Nonpotable Water System	1	LS		
2.65	Clearing, grubbing, and final grading work within Indian River Farms Water Control District (IRFWCD) Lateral "A" Canal and North Relief Canal Right-of-Ways as described in the Special Conditions to the IRFWCD Permit to Connect to or Use District Facilities, No. 20-12, included herein in Appendix A.	1	LS		
2.66	2" PVC electrical conduit for future fiber optic cable	1	LS		
SUBTOTAL PART 2 - SITE WORK					
3.00 LANDSCAPING					
<i>NOTE: BID ITEMS 3.01 THROUGH 3.18 ARE SHOWN ON DRAWING L1</i>					
3.01	Relocate and maintain until Final Acceptance, existing sable palms shown on Drawing C1a to be relocated	88	Each		
3.02	Live Oak (<i>Quercus virginiana</i>) 4" minimum diameter at 0.5' above grade, minimum 18' high	87	Each		

CONTRACTOR'S NAME: _____

3.03	Live Oak (<i>Quercus virginiana</i>) 4" minimum DBH, minimum 18' high	148	Each		
3.04	Slash Pine (<i>Pinus elliottii var densa</i>) 2" minimum diameter at 0.5' above grade, minimum 12' high	54	Each		
3.05	Scrub Hickory (<i>Carya floridana</i>) 2" minimum diameter at 0.5' above grade, minimum 12' high	36	Each		
3.06	Bald Cypress (<i>Taxodium distichum</i>) 2" minimum diameter at 0.5' above grade, minimum 12' high	3	Each		
3.07	Wax Myrtle (<i>Myrica cerifera</i>) 2" minimum diameter at 0.5' above grade, minimum 6' high	87	Each		
3.08	Southern Red Cedar (<i>Juniperus silicicola</i>) 2" minimum diameter at 0.5' above grade, minimum 6' high	152	Each		
3.09	Scrub Hickory (<i>Carya floridana</i>) 2" minimum diameter at 0.5' above grade, minimum 6' high	75	Each		
3.10	Rusty Lyonia (<i>Lyonia ferruginea</i>)	89	Each		
3.11	Wild Coffee (<i>Pyschotria nervosa</i>)	713	Each		
3.12	Cocoplum (<i>Chrysobalanus icaco</i>)	288	Each		
3.13	Firebush (<i>Hamelia patens</i>)	353	Each		
3.14	Marlberry (<i>Ardisia escalloniodes</i>)	240	Each		
3.15	Necklacepod (<i>Sophora tomentosa</i>)	319	Each		
3.16	Saltmarsh Cordgrass (<i>Spartina patens</i>)	60	Each		
3.17	Pink Muhly Grass (<i>Muhlenbergia capillaris</i>)	334	Each		
3.18	Silver Saw Palmettos (<i>Serenoa repens</i>)	36	Each		
NOTE: BID ITEMS 3.19 THROUGH 3.27 ARE SHOWN ON DRAWING L2					
3.19	"ROSE" color code Native Grass Hydroseed Mix	3.94	Acres		
3.20	"ORANGE" color code planting for Wetland Polishing Marsh #1	4,940	SF		
3.21	"ORANGE" color code planting for Wetland Polishing Marsh #2	7,300	SF		
3.22	"GREEN" color code planting for Wetland Polishing Marsh #1	9,140	SF		
3.23	"GREEN" color code planting for Wetland Polishing Marsh #2	10,100	SF		
3.24	"BRIGHT BLUE" color code planting on Sheet L2 (50% Mulhy Grass and 50% Sand Cordgrass) mix	4,900	SF		
3.25	"PURPLE" color code planting for Wetland Polishing Marsh #1	1	LS		
3.26	"PURPLE" color code planting for Wetland Polishing Marsh #2	1	LS		
3.27	"BLUE" color code planting in Sheet L2 for 15' wide berm/service road	0.49	Acres		
SUBTOTAL PART 3 - LANDSCAPING					
4.00	ALL OTHER WORK				
4.1	All other equipment, material, and Work required to complete the project not specifically listed in Parts 1, 2, or 3 above.	1	LS		
SUBTOTAL PART 4 - ALL OTHER WORK					
TOTAL PART A (PART 1 + PART 2 + PART 3 + PART 4)					
PART B OF THE CONTRACT					
5.0	LANDSCAPE MAINTENANCE AND WARRANTY PERIOD				
5.1	Twelve-Month Maintenance and Warranty Period	12	Month		
5.2	Twelve-Month Exotic and Invasive Vegetation Elimination Period	12	Month		
TOTAL PART B					
TOTAL PART A + PART B					

SECTION 01025 – ADDENDUM 2
MEASUREMENT AND PAYMENT

1.1 DESCRIPTION

- A. The items listed beginning with Paragraph 1.5, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. Furnish and install any items shown or omitted that are required for a complete installation, at no additional cost to the OWNER, even if the words “furnish” or “install” are not present in the bid item description. (In the case of OWNER purchased equipment, OWNER will furnish the equipment for CONTRACTOR to install.) Unless provided for in a specific bid item, no direct or separate payments will be made for providing items such as but not limited to, miscellaneous temporary or accessory works, plant, services, construction staking and survey control, repair or replacement of existing utilities, job signs, sanitary requirements, testing equipment and installations, safety devices, replacement of unpaved roads, clean-up, protection of the Work and property, field verification or location of buried utilities, water supplies, power, maintaining traffic, removal of waste, watchmen, coordination with others, tools, fuel, disposal fees, and all other requirements of the Contract. Compensation for all such services, things, and materials shall be included in the prices stipulated for the lump sum or unit price pay items, as applicable, listed herein.
- B. Each lump sum and unit price pay item will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR’s overhead and profit for each item.
- C. Note that many of the descriptions for payment of the bid items listed below may include the words “including but not limited to” followed by a list of specific items that are included in the bid item. The use of “included but not limited to” or similar words, means that other items may be included in the bid item, but they have not been listed by the ENGINEER. If a list is provided, it is intended only as an aid to the CONTRACTOR and it shall not limit the actual items that are or should be included in the bid item. Provide and install all items necessary for a complete installation whether or not the items are listed.
- D. Furnish and install all necessary items for the Work. Unless it is specified that OWNER will furnish an item, CONTRACTOR shall furnish all items necessary for the Work whether or not the word “furnish” or similar terminology is mentioned in the text.

- E. Unless otherwise indicated herein, all lump sum pay items will be paid based on the estimated percentage complete at the time of the pay request pay period.

1.2 ENGINEER'S ESTIMATE OF QUANTITIES

- A. ENGINEER's estimated quantities for unit price items, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparing Bids. OWNER does not expressly or by implication agree that the nature of the materials encountered or the actual quantities of material encountered or required will correspond therewith. OWNER reserves the right to increase or decrease any quantity or to eliminate entirely, any quantity as OWNER may deem necessary. CONTRACTOR will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work ordered by OWNER, and for use in the computation of the value of the Work performed for progress payments.

1.3 RELATED PROVISIONS

- A. Payments to CONTRACTOR: Refer to General Conditions and Agreement.
- B. Changes in Contract Price: Refer to General Conditions.

1.4 ADDITIONAL REQUIREMENTS FOR PAYMENT

- A. Submit the following items with each pay request. No payment shall be made until these items are submitted to the ENGINEER and approved.
 1. Up-to-date Progress Record Drawings. These Progress Record Drawings shall be signed and sealed by a Florida Registered Surveyor and Mapper, certifying that the drawings accurately represent the constructed Work at the date of the pay request. For Record Drawings for final payment, refer to Section 01720. No payment will be made for Work not constructed to the dimensions, grades, elevations, etc. shown or implied by the Construction Documents.
 2. Up-to-date Construction Schedule.
 3. See additional requirements listed in [Section 00622 – Contractor's Application for Payment](#).

1.5 BID ITEMS

PART A OF THE CONTRACT

PART 1 - GENERAL ITEMS

A. Bid Item 1.01 – Mobilization/Demobilization

1. Measurement and Payment: The lump sum payment will be full compensation for mobilization of construction operations at both sites, including but not limited to performance of construction preparatory operations, all labor and materials necessary to transport equipment and personnel to the project sites, temporary construction utilities, CONTRACTOR's field offices, and removing all of the CONTRACTOR's equipment, etc. from the project sites when the Work is complete. The total lump sum to be paid for this item shall not exceed five (5) percent of the total bid amount. No additional payment will be made for demobilization or remobilization due to shutdowns, suspensions of work, or for other mobilization activities. Payment schedule:¹
 - a. Fifty (50) percent of the bid item amount may be paid in the first application for payment; and
 - b. The remaining fifty (50) percent of the bid item amount shall be paid in the last application for payment as demobilization.

B. Bid Item 1.02 – Maintenance of Traffic

1. Measurement and Payment: The lump sum payment will be full compensation for implementation of Traffic Control Plans, including but not limited to furnishing all labor, materials, equipment and incidentals required to maintain traffic, including necessary detour facilities and traffic control signals during construction, and conformance to requirements of the Contract Documents, the "Manual of Uniform Traffic Control Devices" (M.U.T.C.D.) Part IV, and Florida Department of Transportation Roadway and Traffic Design Standards Index No. 600 series.

C. Bid Item 1.03 - Project Record Documents

1. Measurement and Payment: The lump sum payment will be full compensation, including but not limited to all labor, materials, and equipment required to prepare Project Record Documents. This bid item shall be paid in the final pay request and after the Record Documents have been approved by the ENGINEER.

D. Bid Item 1.04 – Public Construction Bond

1. Measurement and Payment: The lump sum payment will be full compensation for providing a Bond as required by these Contract Documents. The total lump sum to be paid for this item shall not exceed three (3) percent of the total bid.

¹ Note: For all bid items for which payment is broken into partial payments, retainage will also be withheld from these payments just as retainage is withheld from all other payments for all other bid items. For example, when a payment item states that "Fifty (50) percent of the bid item amount may be paid in the first application for payment," ten (10) percent of this amount will be withheld as retainage. This is typical for all payment items herein.

This item may be paid with the first application for payment.

E. Item 1.05 – Construction Photographs

1. Measurement and Payment: The lump sum payment will be full compensation for photographic construction documentation as specified.

F. Bid Items 1.06 - Insurance Coverage

1. Measurement and Payment: The lump sum payments will be full compensation for providing the insurance coverage required by the Contract Documents. Pay Schedule:
 - a. Fifty (50) percent of the bid item amount may be paid in the first application for payment;
 - b. The remaining fifty (50) percent of the bid item amount shall be paid in the final application for payment.

G. Item 1.07 – Engineer’s and Contractor’s Field Office

1. Measurement and Payment: The lump sum payment will be full compensation for furnishing, stocking, and maintaining the field office and all other items specified in Section 01590.

PART 2 – SITE WORK

A. Bid Item 2.01 – Wildlife Barrier and Erosion Control Silt Fencing

1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing the silt fencing wildlife protection and erosion control barrier as shown on the Drawings. This Work includes but is not limited to providing all labor, fuel, materials, equipment, hardware, appurtenances, installation, continued maintenance and repair of installed system, etc.

B. Bid Items 2.02 – Clear and Grub (including demolitions) including hauling material offsite for disposal

1. Measurement and Payment: The lump sum payment will be full compensation for performing clearing, grubbing, demolitions, and related operations as specified in Sections 02040 and 02050. This Work includes but is not limited to providing all labor, fuel, materials, equipment, hardware, appurtenances, disposal fees, etc. Not included in this pay item is the wildlife barrier and erosion control silt fencing, which is included in Bid Item 2.01.

C. Bid Item 2.03 – Monitoring existing structures per Section 02220, paragraph 3.15

1. Measurement and Payment: The lump sum payment will be full compensation for preparing pre-vibratory and post-vibratory inspection reports and

coordinating all vibration monitoring measurements as discussed in Section 02220, paragraph 3.15.

D. Bid Item No. 2.04 – Dewatering

1. Measurement and Payment: The lump sum payment will be full compensation for all dewatering and legally treating and disposing of dewatering water in accordance with all permits, including but not limited to all labor, materials, equipment, permit acquisition (but not permit fees), fuel, pumps, hose/piping, water quality testing, dewatering water treatment, etc. for the duration of the project. This item is discussed generally in Section 02225.

E. Bid Item No. 2.05 – Grade all areas not included in other pay items

1. Measurement and Payment: The lump sum payment will be full compensation for grading, including but not limited to all labor, materials, equipment, transportation, fuel, etc. in accordance with Section 02230 and as shown or implied on the Drawings.

F. Bid Item 2.06 – Type B chain link perimeter fencing with 3-strand barb wire

1. Method of Measurement – The quantity to be paid for will be the quantity in lineal feet, completed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for all Work specified, including but not limited to furnishing and installing fence posts, fencing material, top and bottom rails, coating, tie wire, tension wire, barbed wire, hog wire, hardware, concrete bases, wildlife passages, etc.

G. Bid Item 2.07 - 46' wide two-piece cantilevered chain link fence gate with 3-strand barb wire at site entrance

1. Method of Measurement – The quantity to be paid for will be the number of 46' wide two-piece cantilevered slide gates completed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for all Work specified, including but not limited to furnishing and installing gates, posts, barb wire, top and bottom rails, tension wire, tie wire, coating, all required hardware, concrete bases, Fire Department key access box (Knox Box), etc.

H. Bid Item 2.08 - 24' wide two-piece cantilevered chain link fence gate with 3-strand barb wire at site entrance

1. Method of Measurement – The quantity to be paid for will be the number of 24' wide two-piece cantilevered slide gates completed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for all Work specified, including but not limited to furnishing and installing gates, posts, barb wire, top and bottom rails, tension wire, tie wire, coating, all required hardware, concrete bases, Fire Department key access box (Knox Box), etc.

- I. **Bid Item 2.09 – Type B chain link perimeter fencing with no barb wire**
1. Method of Measurement – The quantity to be paid for will be the quantity in lineal feet, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for all Work specified, including but not limited to furnishing and installing fence posts, fencing material, top and bottom rails, coating, tie wire, tension wire, hog wire, hardware, concrete bases, etc.
- J. **Bid Item 2.10 – 8’ wide single chain link fence gate with no barb wire**
1. Method of Measurement – The quantity to be paid for will be the number of 8’ wide single chain link fence gates completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for all Work specified, including but not limited to furnishing and installing gates, posts, top and bottom rails, tension wire, tie wire, coating, all required hardware, concrete bases, etc.
- K. **Bid Item 2.11 - 12" thick cemented coquina shell driving surface at 53rd Street entrance**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the coquina shell driving surface. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, etc. all as shown or implied by the Drawings and Specifications.
- L. **Bid Item 2.12 - 12" thick Type B stabilized subgrade below cemented coquina shell driving surface at 53rd Street**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the subgrade. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, etc. all as shown or implied by the Drawings and Specifications.
- M. **Bid Item 2.13 – 2” thick Type SP-12.5 asphalt concrete pavement**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the asphalt pavement. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, tack coat, asphalt, etc. all as shown or implied by the Drawings and Specifications.

- N. **Bid Item 2.14 - 8" thick cemented coquina shell base below asphalt pavement**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the coquina shell base. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, etc. all as shown or implied by the Drawings and Specifications.
- O. **Bid Item 2.15 - 12" thick Type B stabilized subgrade below asphalt pavement**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the subgrade. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, etc. all as shown or implied by the Drawings and Specifications.
- P. **Bid Item 2.16 – Minimum 8" thick asphalt millings drives, including stabilized subgrade and filter fabric**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the asphalt millings drives. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, clean asphalt millings, filter fabric, subgrade, etc. all as shown or implied by the Drawings and Specifications.
- Q. **Bid Item 2.17 – Grass Surface Service Road**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the service roads that are indicated on the Drawings to receive hydroseeding. (Hydroseeding is not included in this Bid Item, but is included in Bid Item 3.27.) This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, etc. all as shown or implied by the Drawings and Specifications.
- R. **Bid Item 2.18 – Stop Sign at 53rd Street**
1. Method of Measurement – The quantity to be paid for will be the quantity of stop signs installed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the signs. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, sign posts, sign, concrete, etc. all as shown or implied by the Drawings and Specifications.

- S. **Bid Item 2.19 – Painting parking lot area stripes with thermoplastic paint, including all required handicap parking painting**
1. Measurement and Payment: The lump sum payment will be full compensation for painting the parking area as required by these Contract Documents.
- R. **Bid Item 2.20 – Handicap Parking Sign**
1. Method of Measurement – The quantity to be paid for will be the quantity of handicap parking signs installed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the signs. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, sign posts, sign, concrete, etc. all as shown or implied by the Drawings and Specifications.
- S. **Bid Item 2.21 – Concrete tire stops**
1. Method of Measurement – The quantity to be paid for will be the quantity of tire stops installed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the tire stops. This Work includes but is not limited to providing all labor, materials, equipment, tire stops, etc. all as shown or implied by the Drawings and Specifications.
- T. **Bid Item 2.22 – Pole Barn**
1. Measurement and Payment: The lump sum payment will be full compensation for designing, furnishing, permitting, and installing the pole barn as shown on the Drawings and Specifications, complete, including but not limited to all labor, materials, equipment, professional engineering services, blueprints, applying for and obtaining Building Department permit (but not including Building Department permit fee), gutters and downspouts, chain link security fencing and cantilever gate, lighting, etc.
- U. **Bid Item 2.23 – Pole Barn concrete floor slab**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for designing and constructing the floor slab. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, professional engineering services, required permits (but not permit fees), etc. all as shown or implied by the Drawings and Specifications.
- V. **Bid Item 2.24 – Pole Barn concrete driveway**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.

2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the driveway. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, etc. all as shown or implied by the Drawings and Specifications.
- W. **Bid Item 2.25 – Dumpster pad with fence and gate per details on Sheet C10**
1. Measurement and Payment: The lump sum payment will be full compensation for constructing the dumpster pad, fence, and gate as detailed on Sheet C10, including but not limited to all labor, materials, equipment, bollards, concrete, fencing, etc. The dumpster is not included in this Bid Item.
- X. **Bid Item 2.26 – Minimum 8" thick asphalt millings drive for dumpster pad, including stabilized subgrade and filter fabric**
1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the asphalt millings drive. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, clean asphalt millings, filter fabric, subgrade, etc. all as shown or implied by the Drawings and Specifications.
- W. **Bid Item 2.27 – Non-Potable Irrigation System**
1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing the irrigation well, pump, piping, concrete, hose bibs, etc. as detailed on Sheet C10 and as specified. All required permits are also included in this pay item, but permit fees are not included.
- X. **Bid Item 2.28 - Influent pipe connection (North Relief Canal to Headworks Structure)**
1. Measurement and Payment. The lump sum payment will be full compensation for furnishing and installing the influent 42" span x 29" rise aluminum pipe arch from the North Relief Canal to the Headworks Structure. This Work includes but is not limited to furnishing and installing piping, filter fabric, canal bank side and bottom stabilization, excavation, backfill, compaction, cleaning, connection to Headworks Structure, restoration of North Relief Canal right-of-way and canal banks, etc. as shown or implied on the Drawings, Specifications, or required by Indian River Farms Water Control District permits.
- X. **Bid Item 2.29 - Effluent pipe connection (Structure S15 to North Relief Canal)**
1. Measurement and Payment. The lump sum payment will be full compensation for furnishing and installing the effluent 36" diameter CAP from Structure S15 to the North Relief Canal. This Work includes but is not limited to furnishing and installing piping, filter fabric, canal bank side and bottom stabilization,

excavation, backfill, compaction, connection to Structure S15, animal guard, cleaning, restoration of North Relief Canal right-of-way and canal banks, etc. as shown or implied on the Drawings, Specifications, or required by Indian River Farms Water Control District permits.

Y. Bid Item 2.30 – Headworks Structure

1. Measurement and Payment. The lump sum payment will be full compensation for constructing the Headworks Structure and furnishing and installing all related equipment and appurtenances not specifically listed in separate Bid Items. This Work includes but is not limited to excavation, backfill, compaction, grating, concrete, formwork, labor, reinforcing steel, handrail systems, handrail posts and safety chains, double door hatch, link seals and sleeves, washed river rock and filter cloth at end of chutes, etc. as shown or implied on the Drawings and Specifications.

(A detailed Schedule of Values for the Work included in this Bid Items shall be provided by the CONTRACTOR per the Schedule of Values, which shall be used for Pay Request purposes. See [Section 01026](#).)

Z. Bid Item 2.31 – “L” shaped concrete Work Slab abutting Headworks Structure

1. Method of Measurement – The quantity to be paid for will be the quantity in square yards, completed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for constructing the concrete work pad. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, grading, compacting, concrete, reinforcing steel, etc. all as shown or implied by the Drawings and Specifications.

AA. Bid Item 2.32 – Primary Influent Screen and Controls

1. Measurement and Payment. The lump sum payment will be full compensation for furnishing and installing the primary influent screening system and all related equipment and appurtenances not specifically listed in separate Bid Items. This Work includes but is not limited to the self-cleaning Duperon HarvestRake, control panel and controls, remote controls, supports, testing, etc. as shown or implied on the Drawings and Specifications.

BB. Bid Item 2.33 – Influent Pumps and Pump Controls

1. Measurement and Payment. The lump sum payment will be full compensation for furnishing and installing the Headworks’ influent pumps and pump controls and all related equipment and appurtenances not specifically listed in separate Bid Items. This Work includes but is not limited to pumps, control panel, pump control system, concrete pad for pump control panel, pump discharge piping up to long radius reducing bends #8 and #21 (as shown on Sheet PS1), testing, etc. as shown or implied on the Drawings and Specifications.

- CC. Bid Item 2.34 – Slide Gate #7 (for Headworks Structure influent piping)**
1. Method of Measurement – The quantity to be paid for will be the quantity of slide gates furnished, installed, and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing each slide gate. This Work includes but is not limited to providing all labor, materials, equipment, transportation, fuel, gates, testing, etc. all as shown or implied by the Drawings and Specification Section 11016.
- DD. Bid Item 2.35 – Headworks area discharge piping, valves, fittings, etc. from (and including) Bends #8 and #21 to (and including) Bend #19, as shown on Sheet PS1**
1. Measurement and Payment. The lump sum payment will be full compensation for furnishing and installing the Headworks area discharge piping system that connects to the force main leading to the Water Lettuce Scrubbers. This Work includes but is not limited to all piping, valves, fittings, pipe supports, appurtenances, flushing, pressure testing, bollards, etc. as shown or implied on the Drawings and Specifications.
- EE. Bid Item 2.36 – Water Lettuce Scrubber force main and distribution header piping system**
1. Measurement and Payment. The lump sum payment will be full compensation for furnishing and installing the Water Lettuce Scrubber force main and distribution header system. This Work includes but is not limited to all piping, valves, fittings, joint restraint, concrete work pads, appurtenances, flushing, pressure testing, etc. as shown or implied on the Drawings and Specifications, from Bend #19 (shown on Sheet PS1) to the discharges into Structures S1 through S6, inclusive; except for the flow meters, Structures S11 and S12, and related appurtenances within those structures that are specifically listed in separate Bid Items.
- FF. Bid Items 2.37 and 2.38 – Flow Meters No. 1 and No. 2**
1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing each flow meter and all related equipment and accessories. This Work includes but is not limited to providing all labor, materials, equipment, hardware, flow meter, amplifier enclosure and support posts, flow meter signal and electrical cable, spare spool piece, optional parts, testing, bollards, etc. as shown or implied on the Drawings and Specifications.
- GG. Bid Items 2.39 and 2.40 - Structures S11 and S12**
1. Measurement and Payment: The lump sum payment will be full compensation for constructing the structures. This Work includes but is not limited to providing all labor, materials, concrete, reinforcing steel, traffic bearing lid, formwork,

curing compound, excavation, compaction, etc. as shown or implied on the Drawings and Specifications.

HH. Bid Item 2.41 – Structure S11 and S12 Sump Pumps

1. Method of Measurement – The quantity to be paid for will be the quantity of sump pumps systems furnished, installed, and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing each sump pump system. This Work includes but is not limited to all pumps, piping, electric, etc. as shown or implied on the Drawings and Specifications.

II. Bid Item 2.42 – Structures S1 through S6

1. Method of Measurement – The quantity to be paid for will be the quantity of structures installed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing each structure. This Work includes but is not limited to all labor, fuel, materials, professional engineering services, concrete, reinforcing steel, excavation, backfilling, compaction, etc. as shown or implied on the Drawings and Specifications.

JJ. Bid Item 2.43, parts a through m, inclusive – Primary Treatment Units including all associated grating, handrails, appurtenances, etc.

1. Measurement and Payment. The lump sum payment will be full compensation for constructing complete and acceptable, each of the items listed under the bid item heading. See Drawings C18 and C19 for individual bid item boundaries. This Work includes but is not limited to furnishing and installing all equipment, furnishings, concrete, form boards, reinforcing steel, materials, excavation/fill-backfill/compaction, grating systems, handrail systems, stop log systems, slide gates, ladders, etc. shown or implied on the Drawings and Project Specifications, except for items that are specifically included in separate bid items. Note: HDPE liner installation for the Water Lettuce Scrubbers is included in this bid item; but construction of the interior perimeter berm, which is part of the 15-foot wide Service Road/Berm is not included in this bid item. Also, the cost of the Algal Unit Drain Sumps and their stop log systems shall be included in the respective Algal Reaeration Unit Costs.

(A detailed Schedule of Values for the Work for all these various bid items shall be provided by the CONTRACTOR per the Schedule of Values, which shall be used for Pay Request purposes. See [Section 01026](#).)

KK. Bid Items 2.44 and 2.45 – 4” DIP water lettuce sludge supernatant force main from Sludge Storage Areas #1A and #2B

1. Method of Measurement – The quantity to be paid for will be the quantity of sludge supernatant force main installed and accepted.

2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the sludge supernatant force mains. This Work includes but is not limited to all piping, valves, fittings, joint restraint, pipe supports, appurtenances, concrete pad, bollards, etc. as shown or implied on the Drawings and Specifications.
- LL. **Bid Items 2.46 and 2.47 – Final Settling Basins and Wetland Polishing Marshes, including GCL**
1. Measurement and Payment: The lump sum payment will be full compensation for constructing the final settling basins, wetland polishing marshes, and islands, including but not limited to all labor, materials, equipment, grading, compaction, furnishing and installing filter fabric, rubble, bottom delineator floats and anchors, geosynthetic clay liner (GCL), transportation, fuel, etc. as shown or implied on the Drawings and Specifications.
- MM. **Bid Item 2.48 - Rubble Riprap at southwest corner of Wetland Polishing Marsh #1**
1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing rubble riprap as shown or implied on Sheet C10 and the Specifications, including but not limited to all labor, materials, equipment, geotextile fabric, etc.
- NN. **Bid Items 2.49 and 2.50 - Structures S8 and S9**
1. Measurement and Payment: The lump sum payment will be full compensation for constructing the structures. This Work includes but is not limited to providing all labor, materials, concrete, reinforcing steel, formwork, curing compound, excavation, compaction, grating, bollards, handrail systems, Tuff-Booms, etc. as shown or implied on the Drawings and Specifications.
- OO. **Bid Item 2.51 – Structures S7 and S13**
1. Method of Measurement – The quantity to be paid for will be the quantity of structures installed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing each structure. This Work includes but is not limited to all materials, professional engineering services, concrete, reinforcing steel, traffic bearing grating, excavation, backfilling, compaction, etc. as shown or implied on the Drawings and Specifications.
- PP. **Bid Item 2.52– Structures S10 and S14**
1. Method of Measurement – The quantity to be paid for will be the quantity of structures installed and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing each structure. This Work includes but is not limited

to all materials, professional engineering services, concrete, reinforcing steel, traffic bearing grating, excavation, backfilling, compaction, etc. as shown or implied on the Drawings and Specifications.

QQ. Bid Items 2.53 and 2.54 – 18” RCP

1. Measurement and Payment. The lump sum payment will be full compensation for furnishing and installing the 18” RCP between the structures. This Work includes but is not limited to furnishing and installing piping, excavation, backfill, compaction, connection to structures, filter fabric, cleaning, etc. as shown or implied on the Drawings and Specified.

RR. Bid Item 2.55 – Tideflex inline check valve at Structure S9 discharge

1. Method of Measurement – The quantity to be paid for will be the quantity of Tideflex inline check valves installed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing each check valve. This Work includes but is not limited to all valves, appurtenances, etc. as shown or implied on the Drawings and Specifications.

SS. Bid Item 2.56 – 24" RCP between Structures S8 and S9

1. Method of Measurement – The quantity to be paid for will be the quantity in lineal feet, completed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the piping. This Work includes but is not limited to providing all labor, materials, equipment, hardware, pipe, appurtenances, connections, traffic bearing grating, excavation, backfilling, compaction, filter fabric, cleaning, etc. all as shown or implied by the Drawings and Specifications.

TT. Bid Item 2.57 – 36" RCP between Structures S9 and S15

1. Method of Measurement – The quantity to be paid for will be the quantity in lineal feet, completed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the piping. This Work includes but is not limited to providing all labor, materials, equipment, hardware, pipe, appurtenances, connections, excavation, backfilling, compaction, filter fabric, cleaning, etc. all as shown or implied by the Drawings and Specifications.

UU. Bid Item 2.58– Structure S15

1. Method of Measurement – The quantity to be paid for will be the quantity of structures installed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing each structure. This Work includes but is not limited to all labor, fuel, materials, professional engineering services, concrete,

reinforcing steel, traffic bearing access doors, flow channel, excavation, backfilling, compaction, bollard, etc. as shown or implied on the Drawings and Specification Section 11304.

VV. Bid Item 2.59 – Site Electric

1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing all electric Work required to energize and operate the facility that has not been identified or included in the above Bid Items, including but not limited to wire, conduit, fittings, coordination with FPL, etc. as shown or implied on the Drawings and Specifications.

WW. Bid Item 2.60 – Portable Water Lettuce Supernatant/Sludge Pump

1. Method of Measurement – The quantity to be paid for will be the quantity of specified Water Lettuce supernatant/sludge pumps furnished and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing the pump, including all options and other equipment specified. This Work also includes but is not limited to providing a full tank of fuel and startup and testing services, etc. as shown or implied by the Drawings and Specifications.

XX. Bid Item 2.61 – Portable Eyewash Station

1. Method of Measurement – The quantity to be paid for will be the quantity of specified portable eyewash stations furnished, installed, and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the portable eyewash station with mounting bracket and refills as shown or implied by the Drawings and Specifications.

YY. Bid Item 2.62 – Safety Equipment

1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing all safety equipment specified in Section 11012 – Safety Equipment.

ZZ. Bid Item 2.63 – White solid PVC/Vinyl privacy perimeter fence

1. Method of Measurement – The quantity to be paid for will be the quantity in lineal feet, completed and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for all Work specified, including but not limited to furnishing and installing fence posts, fencing material, post caps, concrete, screws and other hardware, etc.

A1. Bid Item 2.64 – Nonpotable Water System

1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing the nonpotable water system shown and detailed on Sheet C10, including but not limited to well, well pump, diaphragm tanks, valves,

pipe, concrete slab, industrial hose and nozzle, etc.

A1. Bid Item 2.65 – Permit Special Condition Work within Indian River Farms Water Control District Right-of-Ways

1. Measurement and Payment: The lump sum payment will be full compensation for performing the Work described in the Special Conditions to the Indian River Farms Water Control District (IRFWCD) Permit to Connect to or Use District Facilities, No. 20-12, included herein in Appendix A, including but not limited to clearing, grubbing, and final grading work within IRFWCD's Lateral "A" Canal and North Relief Canal Right-of-Ways.

A2. Bid Item 2.66 – 2” PVC electrical conduit for future fiber optic cable

1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing the electrical conduit, associated fittings, detectable warning tape, and other related appurtenances as shown or implied on the Drawings, including but not limited to clearing, grubbing, compaction, density tests, etc. as required for a complete and proper installation.

PART 3 – LANDSCAPING

A. Bid Items 3.01 – Relocate and maintain until Final Acceptance, existing sable palms shown on Drawing C1a to be relocated

1. Method of Measurement – The quantity to be paid for will be the quantity of sable palms relocated.
2. Basis of Payment – The unit price and payment will constitute full compensation for all Work specified, including but not limited to properly excavating and replanting the palms to the locations shown or implied on the Drawings and maintaining them until Final Acceptance of Part A of the Contract by the OWNER. (Payment for the one-year maintenance period following Final Acceptance shall be included in Part B of the Contract).

B. Bid Items 3.02 through 3.18 – Trees and Shrubs shown on Drawing L1

1. Method of Measurement – The quantity to be paid for will be the quantity of specified trees and shrubs furnished, planted, and accepted.
2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and planting the trees and shrubs as shown or implied on the Drawings and Specifications, including but not limited to plant material, watering, fertilization, and other maintenance during construction.

C. Bid Items 3.19 and 3.27 – Hydroseeding as shown on Drawing L2

1. Method of Measurement – The quantity to be paid for will be the quantity in acres hydroseeded and accepted.

2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and properly applying the hydroseed mixture as shown or implied on the Drawings and Specifications, including but not limited to seed, bulking agents, fertilizer, soil amendments, watering, and other maintenance during construction, etc.
- D. **Bid Items 3.20 through 3.24 – Various plants shown on Drawing L2**
1. Method of Measurement – The quantity to be paid for will be the quantity in square feet of specified plant material furnished, planted, and accepted.
 2. Basis of Payment – The unit price and payment will constitute full compensation for furnishing and installing the plant material as shown or implied on the Drawings and Specifications, including but not limited to plant material, netless erosion control blanket (as applicable), watering and other maintenance during construction, fertilization, etc.
- E. **Bid Items 3.25 and 3.26 – “PURPLE” color code planting for Wetland Polishing Marshes #1 and #2 shown on Drawing L2**
1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing the duck potato plants as indicated. This Work includes but is not limited to providing all labor, materials, equipment, plants, watering and other maintenance during construction, fertilization, etc.

PART 4 – ALL OTHER WORK

- A. **Bid Item 4.1 - All other equipment, material, and Work required to complete the project not specifically listed in Parts 1, 2, or 3 above.**
1. Measurement and Payment: The lump sum payment will be full compensation for furnishing and installing all other items and performing all other Work required for the complete construction and operability of the Work that have not been identified in Bid Parts 1, 2, and 3.

PART B OF THE CONTRACT

- A. **Bid Item 5.1 - Twelve-Month Maintenance and Warranty Period**
1. Method of Measurement – Payment will be on a monthly basis.
 2. Basis of Payment – The unit price and payment will constitute full compensation for maintaining and warranting all hydroseeding and landscaping as specified in Sections 02232 and 02235 of the Specifications. This Work includes, but is not limited to providing all labor, materials, equipment, new hydroseeding, replacement plants, temporary irrigation facilities including maintenance and repairs, fertilization, etc.
- B. **Bid Item 5.2 - Twelve-Month Exotic and Invasive Vegetation Elimination Period**

1. Method of Measurement – Payment will be on a monthly basis.
 2. Basis of Payment – The unit price and payment will constitute full compensation for providing exotic and invasive vegetation elimination as specified in Section 02235 of the Specifications. This Work includes, but is not limited to providing all labor, materials, equipment, herbicide, etc.
- + + END OF SECTION + +

SECTION 11300 – ADDENDUM 2

SUBMERSIBLE PUMPS AND APPURTENANCES FOR HEADWORKS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work under this Section includes, but is not limited to furnishing and installing all pipes, concrete structures, valves, fittings, frames and covers, grating, handrail systems, slide valve, connections, adjustments, electrical and telemetry controls and panels, level controllers, accessories, excavation (including removal and disposal of unsuitable material), dewatering, sheeting and shoring, bedding, backfill, compaction, testing, equipment, supervision, certifications, material, incidentals, and labor for the installation of the submersible pumping system as shown, noted, and reasonably intended by the Drawings and Specifications and making the system functional and ready for service. Payment for the Duperon FlexRake will be paid under a separate pay item.

1.2 QUALITY ASSURANCE

- A. Unity of Responsibility: The CONTRACTOR and pump manufacturer shall assume responsibility for the satisfactory installation and operation of the entire pumping systems, including pumps, motors, controls, motor starters, etc. specified in this Section.
- B. Pre-Shipment Pump Tests:
1. The pump manufacturer shall perform the following inspections and tests on each pumping unit before shipment from factory:
 - a. Impeller, motor rating, and electrical connections shall first be checked for compliance.
 - b. A motor and cable insulation test for moisture content and insulation defects.
 - c. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
 - d. The pump shall be run for a minimum of 30 minutes submerged, a minimum of 10 feet underwater throughout its entire operating range.
 - e. After operational test No. d above, the insulation test No. b above, is to be performed again.
 2. A written report certifying the foregoing steps have been satisfactorily completed shall be supplied for each pump at the time of shipment. A copy

of these tests shall be submitted to the ENGINEER and included in the operation and maintenance manuals furnished.

3. Each pump shall be capable of operating in a totally dry condition under full load without damage for extended periods.
4. The pump manufacturer provide Hydraulic Institute certified pump test curves for each pumping unit.

C. Warranties:

1. Furnish a written manufacturer's warranty against defects in material and workmanship, for a period of one year from OWNER's Final Acceptance of the equipment. The manufacturer's warranty period shall run concurrently with the CONTRACTOR's warranty period. No exception to this provision shall be allowed. Replace without additional expense to the OWNER, all components, which prove defective during the warranty period. Items that are normally expended in service such as oil, grease, or light bulbs are exempt from the warranty.
2. Pumps - In addition to the above warranty, the pump manufacturer shall provide a 10,000-hour warranty, i.e., 100 percent of pump replacement cost within the first 3,000 hours of operation, 50 percent of the replacement cost within 3,000 to 6,500 hours of operation, and 25 percent of the replacement cost within 6,500 to 10,000 hours of operation.
3. Level Sensing Probe – The level sensing probe shall be covered by the probe manufacturer's standard ten-year (minimum) warranty.

D. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

1. ASTM A48, Specification for Grey Iron Castings.
2. ASTM A53, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
3. ASTM A108, Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.
4. ASTM A575, Specification for Steel Bars, Carbon, Merchant Quality, M-Grades.
5. ASTM A576, Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality.
6. ASTM A584, Specification for Copper Alloy Sand Castings for General Applications.

E. Field Tests: Perform field tests as specified in this Section.

F. The pump manufacturer shall supply the pump monitoring units as specified elsewhere herein.

1.3 SUBMITTALS

- A. Shop Drawings: Submit detailed drawings on all equipment, said equipment may include but not be limited to rails, discharge elbow, access hatches, and all other related appurtenances. Reference [Section 01340](#), Shop Drawing Procedures, for Submittals. Pump manufacturer shall submit detailed drawings of pump and controls to both ENGINEER and CONTRACTOR, including pump performance data and physical characteristics. Pump curves shall show the various System Head Curves associated with each pump (included herein) plotted against the pump's variable speed operating curves in units of feet and gallons per minute.
- B. Manufacturer's Certificate of Compliance certifying compliance with the referenced specifications and standards (submitted by the pump manufacturer).
- C. Manufacturer's installation instructions (submitted by the pump manufacturer).
- D. Manufacturer's Operation and Maintenance Manuals (submitted by the pump manufacturer). The manuals shall be prepared specifically for this installation and shall include all required cuts, drawings, pump characteristics curves, equipment/parts lists, schematic wiring diagrams, descriptions, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment.
- E. Pre-Shipment Pump Tests specified in [paragraph 1.2.B](#).
- F. Prior to request for Final Payment, the pump manufacturer shall furnish the following to the ENGINEER:
 - 1) Tools and Spare Parts:
 - a) Provide (1) set of all special tools required for normal operation and maintenance.
 - b) The pump manufacturer shall furnish a complete set of recommended spare parts for the first three (3) years operation of the pumping system, which shall include at least the following:
 - (1) One (1) set of upper bearings for each pump supplied.
 - (2) One (1) set of lower bearings for each pump supplied.
 - (3) One (1) set of upper and lower shaft seals for each pump supplied.
 - (4) One (1) relay and phase monitor for each type supplied with the pump control panel for each station.
 - (5) One (1) spare impeller
 - (6) Any special tools required.
 - c) Spare parts shall be properly bound and labeled for easy identification without opening the packaging and suitably protected for long-term

- storage.
- d) Certified copies of the Pre-Shipment Pump Tests.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Pumping units shall comply with Hydraulic Institute Standards.
- B. Pump materials shall comply with the specifications herein.
- C. Where applicable specifications are not designated herein, supply high class commercial grades of materials that meet the requirements specified and which are satisfactory to the ENGINEER.
- D. All hardware shall be Type 316 stainless steel or better.

2.2 PUMPS

- A. REQUIREMENTS: Both pumps shall be variable speed submersible non-clog wastewater pumps.
1. Pump 1 – Pump 1 shall be equipped with a variable speed 25 HP submersible electric motor, connected for operation on 460 volts, 3 phase, 60 hertz power, with 50 feet of submersible cable (SUBCAB) suitable for submersible pump applications. Size the power cable according to NEC and ICEA standards. The cable shall meet P-MSHA Approval. Supply the pump with a mating cast iron 10-inch discharge connection. The pump shall be capable of pumping 1 million gallons per day (mgd) to 5 mgd at the heads listed elsewhere in this Specification. Pump 1 shall be a Flygt Model N-3171.095 or approved equal.
 2. Pump 2 – Pump 2 shall be equipped with a variable speed 60 HP submersible electric motor, connected for operation on 460 volts, 3 phase, 60 hertz power, with 50 feet of submersible cable (SUBCAB) suitable for submersible pump applications. Size the power cable according to NEC and ICEA standards. The cable shall meet P-MSHA Approval. Supply the pump with a mating cast iron 14-inch discharge connection. The pump shall be capable of pumping 5 mgd to 10 mgd at the heads listed elsewhere in this Specification. Pump 2 shall be a Flygt Model N-3301.185/095 or approved equal.
- B. PUMP OPERATING INFORMATION:

1. The pumps will operate as follows:
 - a. Pump 2 is normally "ON".
 - b. Pump 2 "OFF" when water drops to elevation 11.87 and stays "OFF" until manually reset.
 - c. Pump 1 "ON" (at 60 Hz) at elevation 11.87
 - d. Pump 1 "OFF" when water drops to elevation 6.00
 - e. Pump 1 restarts when water rises to elevation 10.00 and continues in this mode (Steps 4 and 5) until Pump 2 is placed back into service manually.

Both pumps cannot operate at the same time.
2. System Head Curves: System Head Curves for each pump at various canal operating levels are presented below.

System Head Loss Curves for Pump 1:

Pump 1 at Low Water Level (EL. 11.87)

Flow at Pump (GPM)	Friction Head Losses (feet)	Minor Head Losses (feet)	Static Head Loss (feet)	TDH (feet)
0	0.00	0.00	10.67	10.67
347	0.04	0.09	10.67	10.80
694	0.14	0.35	10.67	11.16
1,042	0.30	0.78	10.67	11.75
1,389	0.50	1.39	10.67	12.56
1,736	0.76	2.17	10.67	13.61
2,083	1.07	3.13	10.67	14.87
2,431	1.42	4.26	10.67	16.35
2,778	1.82	5.56	10.67	18.05
3,125	2.26	7.04	10.67	19.97
3,472	2.75	8.70	10.67	22.11

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Pump 1 at Elevation 10.00

Flow at Pump (GPM)	Friction Head Losses (feet)	Minor Head Losses (feet)	Static Head Loss (feet)	TDH (feet)
0	0.00	0.00	12.54	12.54
347	0.04	0.09	12.54	12.67
694	0.14	0.35	12.54	13.03
1,042	0.30	0.78	12.54	13.62
1,389	0.51	1.39	12.54	14.44
1,736	0.77	2.17	12.54	15.48
2,083	1.08	3.13	12.54	16.75
2,431	1.44	4.26	12.54	18.24
2,778	1.84	5.56	12.54	19.94
3,125	2.29	7.04	12.54	21.87
3,472	2.78	8.70	12.54	24.01

Pump 1 at Elevation 6.00

Flow at Pump (GPM)	Friction Head Losses (feet)	Minor Head Losses (feet)	Static Head Loss (feet)	TDH (feet)
0	0.00	0.00	16.54	16.54
347	0.04	0.09	16.54	16.67
694	0.14	0.35	16.54	17.03
1,042	0.30	0.78	16.54	17.62
1,389	0.51	1.39	16.54	18.44
1,736	0.77	2.17	16.54	19.48
2,083	1.08	3.13	16.54	20.75
2,431	1.44	4.26	16.54	22.24
2,778	1.84	5.56	16.54	23.94
3,125	2.29	7.04	16.54	25.87
3,472	2.78	8.70	16.54	28.01

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System Head Loss Curves for Pump 2:

Pump 2 at Normal Water Level (EL. 14.87)

Flow at Pump (GPM)	Friction Head Losses (feet)	Minor Head Losses (feet)	Static Head Loss (feet)	TDH (feet)
0	0.00	0.00	7.67	7.67
694	0.04	0.09	7.67	7.80
1,389	0.15	0.34	7.67	8.16
2,083	0.32	0.77	7.67	8.76
2,778	0.54	1.37	7.67	9.59
3,472	0.82	2.15	7.67	10.64
4,167	1.15	3.09	7.67	11.92
4,861	1.54	4.21	7.67	13.41
5,556	1.97	5.49	7.67	15.13
6,250	2.45	6.95	7.67	17.07
6,944	2.97	8.59	7.67	19.23

Pump 2 at Dry Season Water Level (EL. 15.87)

Flow at Pump (GPM)	Friction Head Losses (feet)	Minor Head Losses (feet)	Static Head Loss (feet)	TDH (feet)
0	0.00	0.00	6.67	6.67
694	0.04	0.09	6.67	6.80
1,389	0.15	0.34	6.67	7.16
2,083	0.32	0.77	6.67	7.76
2,778	0.54	1.37	6.67	8.59
3,472	0.82	2.15	6.67	9.64
4,167	1.15	3.09	6.67	10.92
4,861	1.54	4.21	6.67	12.41
5,556	1.97	5.49	6.67	14.13
6,250	2.45	6.95	6.67	16.07
6,944	2.97	8.59	6.67	18.23

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Pump 2 at Low Water Level (EL. 11.87)

Flow at Pump (GPM)	Friction Head Losses (feet)	Minor Head Losses (feet)	Static Head Loss (feet)	TDH (feet)
0	0.00	0.00	10.67	10.67
694	0.04	0.09	10.67	10.80
1,389	0.15	0.34	10.67	11.16
2,083	0.32	0.77	10.67	11.76
2,778	0.54	1.37	10.67	12.59
3,472	0.82	2.15	10.67	13.64
4,167	1.15	3.09	10.67	14.92
4,861	1.54	4.21	10.67	16.41
5,556	1.97	5.49	10.67	18.13
6,250	2.45	6.95	10.67	20.07
6,944	2.97	8.59	10.67	22.23

C. **PUMP DESIGN CONFIGURATION:** Each pump shall be automatically and firmly connected to its discharge connection, guided by no less than two Type 316L stainless steel guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal-to-metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket is not acceptable. No portion of the pump shall bear directly on the sump floor.

D. **PUMP CONSTRUCTION:**

1. Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of Type 316 or better stainless steel. All exposed nuts or bolts shall be Type 316 stainless steel. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.
2. Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

3. Rectangular cross-sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease, or other devices shall be used.
- E. COOLING SYSTEM: Each pump shall be supplied with an integral, self-supplying cooling system. The motor shall be provided with an integral motor cooling system. A stainless steel cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow, providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket.
- F. CABLE ENTRY SEAL: The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter. The grommets shall be compressed by the cable entry unit, thus providing a strain relief function. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered equal.
- G. MOTOR:
1. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Three

thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the motor control panel.

2. The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.
 3. The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C ambient and shall have a NEMA Class B maximum operating temperature rise of 80°C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.
 4. Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.
- H. **BEARINGS:** The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a two-row angular contact ball bearing. The lower bearing shall be a two-row angular contact ball bearing to handle the thrust and radial forces. The minimum L10 bearing life shall be 50,000 hours at any usable portion of the pump curve.
- I. **MECHANICAL SEALS:**
1. Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide seal ring. The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. All seal rings shall

be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

2. Provide each pump with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.
 3. The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast-in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.
 4. Provide a separate seal leakage chamber so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.
- J. PUMP SHAFT: The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings shall not be acceptable. The shaft shall be ASTM A479 S43100-T stainless steel. Shaft sleeves will not be acceptable.
- K. IMPELLER: The impeller shall be of Hard-Iron™ (ASTM A-532 (Alloy III A) 25% chrome cast iron) dynamically balanced, semi-open, multi-vane, backswept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray iron impeller shall be hardened to Rc 60 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

- L. **VOLUTE / SUCTION COVER:** The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of Hard-Iron™ (ASTM A-532 (Alloy III A) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.
- M. **PROTECTION:**
1. Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the motor temperature. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.
 2. The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.
- N. **CATHODIC PROTECTION:** All pumps shall be fitted with zinc anodes to improve corrosion resistance of the pumps. Provide with the spare parts one additional zinc anode set for each pump, with the appropriate number of anodes, fasteners and assembly instructions.
- O. **LIFTING CABLES:** Each pump shall be fitted Type 316 or greater stainless steel lifting chain or cable at least five feet longer than the wet well depth to the wet well top slab. The working load of the lifting system shall be not less than three times greater than the pump weight. Provide an eye in the upper end of the chain or cable for hooking on brackets.
- P. Type 316 stainless steel nameplates giving the name of the manufacturer, head, speed, and all other pertinent data shall be attached to each pump and motor.

2.3 MOTOR STARTERS

- A. The Motor Starters shall be variable speed Motor Controllers equal to Danfoss Aquavar IP20.

2.4 CONTROL

- A. General: All electrical wiring components, wire, cabinet, etc., shall meet the standards of the Electrical Building Code as adopted by Indian River County, and the National Electrical Code.
- B. Level Controls – Level Sensing Probe:
1. Furnish and install a level sensing probe provided by the pump manufacturer. The probe shall be constructed from uPVC 32mm tubing with moulded sensor units at regular intervals along the probe. Each sensor unit shall be PVC injected to prohibit ingress of moisture, and the sensor material shall be Avesta SMO254 stainless steel. The probe shall be pressure injected with an epoxy resin to encapsulate all internal components and connections to form a rigid, homogenous unit.
 2. Mount the probe in a turbulent area of the wet well, suspended on its own Type 316 stainless steel cable, and connected to a 6mm Type 316 stainless steel hook hanging from a 30mm Type 316 stainless steel angle containing a polyurethane squeegee pad. Position in the wet well opening so that the probe can be removed without entering the wet well. The squeegee shall have a 30mm hole and slot, enabling the probe to be pulled through and cleaned. Run the probe cable in a separate conduit away from any high voltage cables.
 3. Space ten (10) sensors along the length of the probe assembly, each individually connected to a correspondingly numbered PVC/PVC .75mm flexible cable. The moulded sensor unit shall contain two Avesta sensors mounted on opposite sides of the sensor unit. Each Avesta sensor shall be 24mm high and no wider than 2mm, and shall protrude from the surface of the PVC. Each sensor unit containing the two Avesta sensors shall be rotated 90 degrees to the previous sensor unit to eliminate tracking between sensors.
 4. Fail Safe - The probe shall have two additional wires that run the length of the probe that will be used to check for cable integrity. The wire shall be of black color on one end, red color on the other and be joined internal to the probe below all other sensors.
 5. Cable - The cable shall be encoded for identification, with numbers and text along the entirety of the cable and at intervals not greater than 200mm. The cable shall be dark blue, with cores light blue cores. The flexible cables shall be capable of supporting the weight of the probe and cable, without the need for additional support. Secure the cable to the top of the probe by a synthetic rubber compression

fitting.

- C. 1. Panel supplier at a minimum shall supply a service rated main breaker control panel that not only supplies the control power and pumps, but also additional distribution for the 5kVA distribution transformer and the rake system per the one-line and panel schedule from the electrical drawings E-4. The main breaker shall also interlock with a 100A generator back-feed breaker.
- 2. Supply an electrical one-line drawing with ladder logic to be reviewed and approved by the OWNER.

2.5 STRUCTURES

- A. Headworks Structure: Refer to the applicable Drawings and Specifications.
- B. Concrete: Requirements shall be as specified elsewhere herein and as shown on the Drawings.
- C. Access Hatches: Access hatches shall be rectangular with extruded aluminum angle/channel frame with heavy duty double lids and 1/4" aluminum diamond plate cover. The hatches shall be hinged as shown on the Drawings and do not have to be traffic bearing. Hinges shall be forged aluminum and hardware shall be all 316 stainless steel with tamper-proof nuts. Doors shall be watertight and shall be equipped with hold-open arms that automatically lock the cover in open position and fitted with red vinyl grip, flush drop handle, stainless steel spring-loaded latching device, inside release handle, and recessed padlock. Doors shall be of the size indicated on the Drawings. Access hatches shall be manufactured by Bilco Company, U.S. Foundry, or approved equal. At dissimilar metals and where in contact with concrete members, the hatches shall receive two coats of a suitable anticorrosion material.
- D. Hardware: The foundation plate for each pump shall be rigidly and accurately anchored into position. All necessary foundation bolts, plates, nuts, and washers shall be furnished by the pump manufacturer for installation by the CONTRACTOR. Each foundation plate shall be minimum 1/2" thick Type 316 stainless steel. Foundation bolts, nuts, washers, miscellaneous hardware, and spare parts shall be Type 316 stainless steel.
- F. Guide Bracket: A sliding guide bracket shall be an integral part of each pumping unit, and each pump casing shall have a machined connecting flange to connect with its cast iron discharge connection, which shall be bolted to the floor of the wet

well with Type 316 stainless steel anchor bolts and so designed as to receive the pump connection without the need of any bolts or nuts. Sealing of the pumping units to the discharge connection shall be accomplished by a simple linear downward motion of the pump, with the entire weight of the pumping unit guided by two (2) Type 316 L stainless steel guides or T-bars, which will press it tightly against the discharge connection. No portion of a pump shall bear directly on the floor of the wet well, and no rotary motion of the pump shall be required for sealing.

- G. Mount a Type 316 stainless steel bracket below the lid to support the power cables and lifting cables for the pumps.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install the submersible pumps, controls, equipment, valves, piping, and appurtenances in accordance with the Drawings, these Specifications, and manufacturer's written instructions.
- B. Install each pumping unit level and plumb to insure it is uniformly supported. Install the guide rails plumb.
- C. Anchors shall be 316 stainless steel or better.

3.2 PUMP STATION FIELD TEST

- A. Furnish the services of factory representatives for three (3) days, minimum. The factory representatives for the pump and control systems must have complete knowledge of proper operation and maintenance of the system. They shall inspect the final installation and supervise the test run of the equipment.
- B. Field tests shall not be conducted until the entire Facility is complete and ready for testing.
- C. After all pumps are completely installed and working under the direction of the manufacturer, conduct in the presence of the ENGINEER and OWNER, such tests that are necessary to indicate that the pumping system conforms to the Specifications. Flow meter certifications may occur at the same time as the pump tests. Supply all electric power, water, labor, equipment, and incidentals required to complete the field tests. Record test voltage and amperage measurements.

- D. Check direction of rotation of all motors and reverse connections if necessary.
- E. If any item fails to meet the Specifications, take corrective measures, or else remove the item and replace it with one that satisfies the conditions specified, at no cost to the OWNER.
- F. All pump operating settings, alarms and shutdown devices shall be calibrated and tested during the field tests.
- G. Deliver five (5) copies of Certified Test Results to the ENGINEER upon completion of satisfactory testing of the equipment and prior to requesting for Final Payment. The "Certified Test Results" shall be on the pump manufacturer's letterhead and must certify that:
 - 1. The pumping system is operating as intended and to the satisfaction and approval of the manufacturer's representative;
 - 2. All controls and equipment specified have been installed except as listed; and
 - 3. The pumping system is ready for operation and acceptance by the OWNER.
- H. Pay for all of manufacturer's onsite services and expenses.

3.3 PAINTING

- A. Shop Painting:
 - 1. The pumps and motors shall have the pump manufacturer's standard painting, suitable to withstand a corrosive, wastewater environment. Protect all nameplates during painting.
 - 2. Gears, bearing surfaces, and other similar surfaces obviously not to be painted shall be given a heavy shop coat of grease or other suitable rust-resistant coating. This coating shall be maintained as necessary to prevent corrosion during periods of storage and erection.

++ END OF SECTION ++

P1		ROOM PEDESTAL MOUNT		VOLTS 240/120V 2P 3W		AIC 22,000			
MOUNTING SURFACE		BUS AMPS 200		MAIN BKR 200		LUGS STANDARD			
FED FROM FPL1		NEUTRAL 100%		LUGS STANDARD					
NOTE 200A QB BREAKER/ SQ D NQ30L1/MH44WP316SS TYPE 316 STAINLESS STEEL ENCLOSURE									
CKT #	CKT BKR	CIRCUIT DESCRIPTION	LOAD KVA		CKT #	CKT BKR	CIRCUIT DESCRIPTION	LOAD KVA	
			A	B				A	B
1	20/1	LIGHTING	1.16		2	20/2	RECEPTACLE	0.54	
3	20/1	LIGHTING		0.116	4		RECEPTACLE		0.72
5	20/1	RECEPTACLE	1.08		6	20/2	RECEPTACLE	0.54	
7	20/1	RECEPTACLE		0.54	8		RECEPTACLE		0.54
9	-/1	SPACE	0		10	50/2	WELL	3.36	
11	-/1	SPACE		0	12		SPACE		3.36
13	-/1	SPACE	0		14	-/1	SPACE	0	
15	-/1	SPACE	0		16	-/1	SPACE	0	
17	-/1	SPACE	0		18	-/1	SPACE	0	
19	-/1	SPACE	0		20	-/1	SPACE	0	
21	-/1	SPACE	0		22	-/1	SPACE	0	
23	-/1	SPACE	0		24	-/1	SPACE	0	
25	-/1	SPACE	0		26	-/1	SPACE	0	
27	30/2	*SPD	0		28	-/1	SPACE	0	
29			0		30	-/1	SPACE	0	
			TOTAL CONNECTED KVA BY PHASE				6.68		5.28
			CONN KVA				CALC KVA		
GENERAL LIGHTING			1.05	1.05			(100%)		
AREA			2,105 SF						
LIGHTING			0.116	0.145			(125%)		
LARGEST MOTOR			6.72	8.4			(125%)		
OTHER MOTORS			0	0			(100%)		
RECEPTACLES			3.96	3.96			(50%>10)		
SIGN OUTLETS			0	0			(125%)		
KITCHEN EQUIP			0	0			(N/A)		
CONTINUOUS			0	0			(125%)		
HEATING			0	0			(N/A)		
COOLING			0	0			(N/A)		
NONCONTINUOUS			0	0			(100%)		
DIVERSE			0	0			(N/A)		
METERED DEMAND			0	0			(125%)		
TOTAL KVA			15.9	17.6					
BALANCED AMPS				73.4					

ONE-LINE NOTES

REPRESENT A N-G BONDED GROUNDING ELECTRODE CONDUCTOR, TYPICALLY SHOWN AT SERVICE ENTRANCES OR OUTPUT OF A SEPARATELY DERIVED SYSTEM SUCH AS AN ISOLATION TRANSFORMER. SEE GROUNDING DETAIL FOR CONDUCTOR SIZING. IF MORE THAN ONE SYMBOL IS SHOWN THEN THE SYMBOL WILL ALSO SHOW THE GEC SIZED SPECIFICALLY FOR THAT DEVICE.

REPRESENT AN ISOLATED N-G BONDED GROUNDING ELECTRODE CONDUCTOR. TYPICALLY SHOWN AT SEPARATE STRUCTURES. SEE GROUNDING DETAIL FOR CONDUCTOR SIZING.

"X" ---KA INDICATE THE AVAILABLE SHORT-CIRCUIT CURRENT LEVELS AT THE LOCATION SHOWN. FAULT CALCULATIONS ARE BASED ON IEEE STD 242-1975 RECOMMENDED PRACTICE FOR PROTECTION AND COORDINATION OF INDUSTRIAL AND COMMERCIAL POWER SYSTEMS. THE SHORT-CIRCUIT CALCULATIONS INCLUDES MOTOR CONTRIBUTIONS EQUAL TO 4 TIMES THE RATED CURRENT OF THE MOTOR AND AN X/R RATIO OF 4.

AIC RATINGS SHOWN AT THE EQUIPMENT WILL BE BASED ON THE SUPPLY VOLTAGE, AVAILABLE FAULT CURRENT AND THE OVER CURRENT DEVICE PROTECTING THE EQUIPMENT. THE SSCOR OF ALL EQUIPMENT SHALL MEET OR EXCEED THE AIC RATING SHOWN. PLEASE NOTE THAT AIC APPLIES ONLY TO OVERCURRENT PROTECTION DEVICES (CIRCUIT BREAKERS, FUSES, ETC.) AND SCOR APPLIES TO A FULLY ASSEMBLED DEVICE (I.E., PANELBOARDS, CONTRACTORS, STARTERS), WHICH MAY USE SPECIFIC AIC-RATED OVERCURRENT PROTECTION DEVICES.

SEE FEEDER SCHEDULE TO IDENTIFY NUMBER OF CONDUITS. THE QUANTITY OF PHASE, NEUTRAL, & EGC IS PER CONDUIT. GEC ARE NOT INCLUDED IN FEEDER SCHEDULE.

FEEDER SCHEDULE

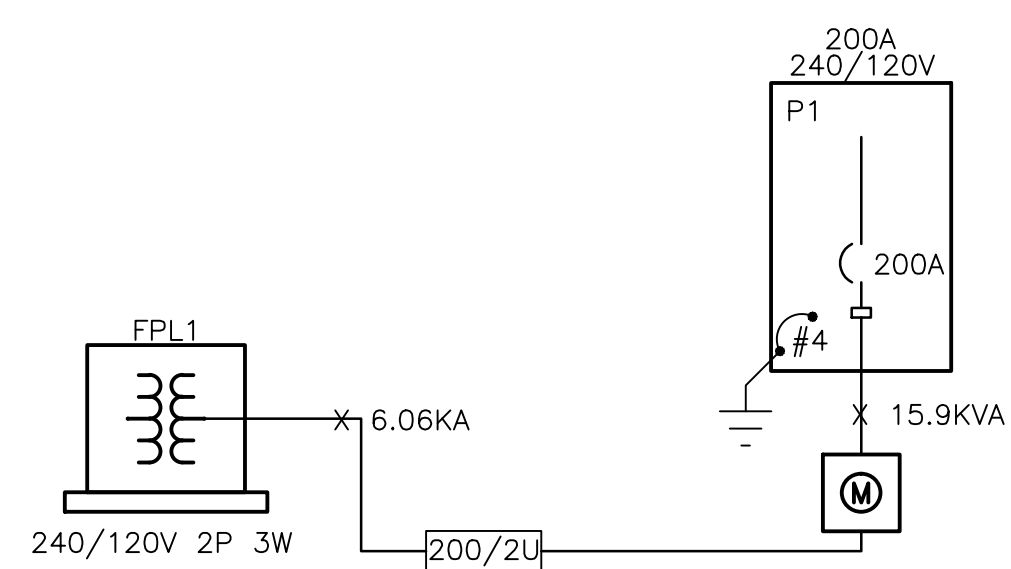
ID	CONDUIT AND FEEDER
15	3/4"C,3#12,#12N,#12G
20/2D	2#12,#12G
20D	3#12,#12G
30/2U	3/4"C,2#10,#10N,#8G
40D	3/4"C,3#8,#10G
100D	1-1/2"C,3#1,#8G
200/2U	2"C,2#3/0,#3/0N
200U	2"C,3#3/0,#3/0N

SIZING METHOD: COPPER, 60°C #12 THROUGH #1, 75°C 1/0 AND ABOVE PVC (EXCEPT WHERE NOTED)

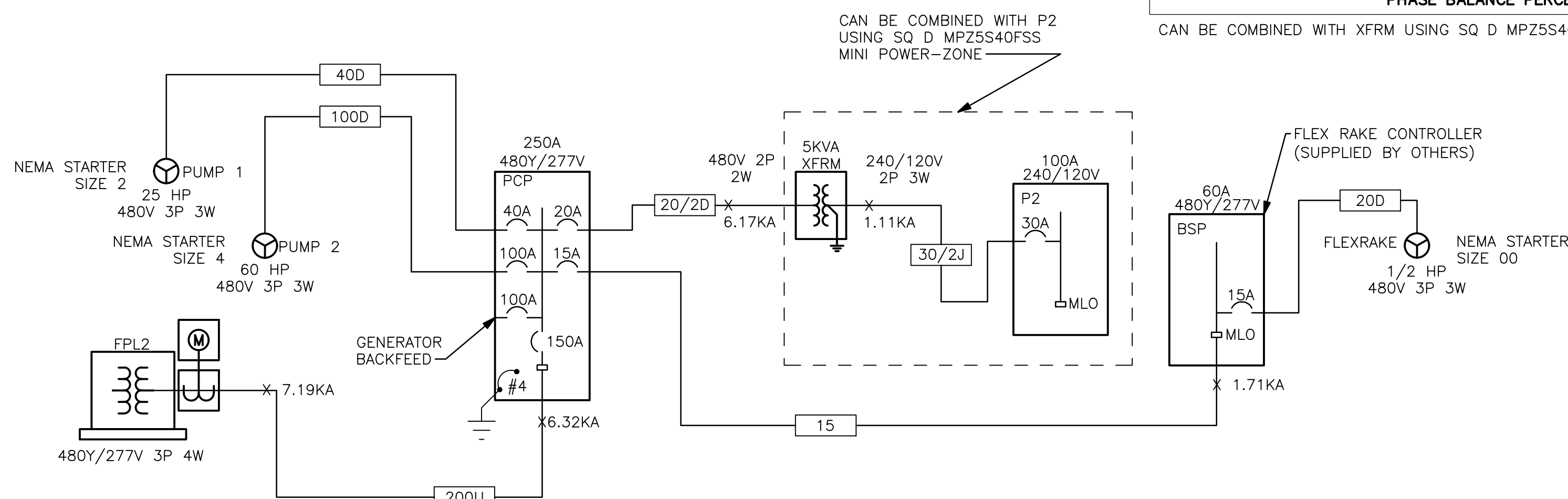
Panel		ROOM PEDESTAL MOUNT		VOLTS 480Y/277V 3P 4W		AIC 22,000	
MOUNTING SURFACE		BUS AMPS 250		MAIN BKR 150		LUGS STANDARD	
FED FROM FPL2		NEUTRAL 100%		LUGS STANDARD			
NOTE PUMP CONTROLLER (SUPPLIED BY OTHERS)							
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	100/3	0	BACKFEED/INTERLOCK	a 2	40/3	28.3	PUMP 1
5				b 4			
7	15/2	0.5	CONTROL POWER	a 8	100/3	64	PUMP 2
9				b 10			
11	15/3	1.41	BAR SCREEN CONTROL PANEL	c 12			
13				a 14	20/2	2.41	XFMR
15				b 16			
			CONN KVA			CALC KVA	
LARGEST MOTOR			0.382			0.478	(125%)
OTHER MOTORS			64			80	(125%)
RECEPTACLES			1.27			1.27	(100%)
KITCHEN EQUIP			1.62			1.62	(50%>10)
SIGN OUTLETS			0			0	(N/A)
			0			0	(125%)
			0			0	(N/A)
			0			0	(100%)
			0			0	(0%)
			0			0	(125%)
TOTAL KVA			96.6			84.7	
BALANCED 3-PHASE AMPS						102	
PHASE BALANCE PERCENT:			PHASE A 103%			PHASE B 100%	PHASE C 97.2%

XFRM		ROOM PEDESTAL		PRIMARY VOLTS 480V 2P 2W		AIC 22,000	
FED FROM PCP		SECONDARY VOLTS 240/120V 2P 3W		KVA 5			
NOTE SQ D 4X5S1FSS							
CKT #	BREAKER TRIP/POLES	CIRCUIT DESCRIPTION	LOAD KVA		FEEDER RACEWAY AND CONDUCTORS		
			A	B			
1	-/2	PANEL P2	1.49	0.926	3/4"C,2#10,#10N,#8G		
			TOTAL CONNECTED KVA BY PHASE				
			1.49		0.926		
			CONN KVA		CALC KVA		
GENERAL LIGHTING			0	0			
AREA			0 SF				
LIGHTING			0.382	0.478	(125%)		
LARGEST MOTOR			0.18	0.225	(125%)		
OTHER MOTORS			0.18	0.18	(100%)		
RECEPTACLES			1.62	1.62	(50%>10)		
SIGN OUTLETS			0	0	(125%)		
KITCHEN EQUIP			0	0	(N/A)		
CONTINUOUS			0.052	0.065	(125%)		
HEATING			0	0	(N/A)		
COOLING			0	0	(N/A)		
NONCONTINUOUS			0	0	(100%)		
DIVERSE			0	0	(N/A)		
METERED DEMAND			0	0	(125%)		
TOTAL KVA			2.41	2.57			
BALANCED AMPS				10.7			
CAN BE COMBINED WITH P2 USING SQ D MPZ5S40FSS							

Panel		ROOM PEDESTAL MOUNTING SURFACE		VOLTS 240/120V 2P 3W		AIC 22,000	
MOUNTING SURFACE		BUS AMPS 100		MAIN BKR MLO		LUGS STANDARD	
FED FROM XFRM		NEUTRAL 100%		LUGS STANDARD			
NOTE SQ D NQ18L1MH38WP W/#316 S/S ENCLOSURE							
CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	20/1	0.386	FLOW METER 1, RECEPTACLE, SLUMP PUMP	a 2	30/2	0	BACKFEED
3	20/1	0.386	FLOW METER 2, RECEPTACLE, SLUMP PUMP	b 4			
5	20/1	0.382	LIGHTING	a 6	20/1	0.18	RECEPTACLE
7	-/1	0	SPACE	b 8	20/1	0.54	RECEPTACLE
9	-/1	0	SPACE	a 10	20/1	0.54	RECEPTACLE
11	-/1	0	SPACE	b 12	-/1	0	SPACE
13	-/1	0	SPACE	a 14	-/1	0	SPACE
15	-/1	0	SPACE	b 16	-/1	0	SPACE
17	-/1	0	SPACE	a 18	-/1	0	SPACE
			CONN KVA			CALC KVA	
LIGHTING			0.382			0.478	(125%)
LARGEST MOTOR			0.18			0.225	(125%)
OTHER MOTORS			0.18			0.18	(100%)
RECEPTACLES			1.62			1.62	(50%>10)
KITCHEN EQUIP			0			0	(N/A)
SIGN OUTLETS			0			0	(125%)
			0			0	(N/A)
			0			0	(100%)
			0			0	(N/A)
			0			0	(125%)
TOTAL KVA			2.41			2.57	
BALANCED AMPS						10.7	
PHASE BALANCE PERCENT:			PHASE A 123%			PHASE B 76.7%	
CAN BE COMBINED WITH XFRM USING SQ D MPZ5S40FSS							



OPERATIONS BUILDING ONE-LINE



PUMP SYSTEM ONE-LINE

WIRING METHODS & MATERIALS

- #
- THE NATIONAL AND LOCAL ELECTRIC AND BUILDING CODES, AND THE ELECTRICAL REQUIREMENTS AS ESTABLISHED BY THE STATE AND LOCAL FIRE MARSHAL, AND RULES AND REGULATIONS OF THE POWER COMPANY SERVING THE PROJECT, ARE HEREBY MADE PART OF THIS SPECIFICATION. SHOULD ANY CHANGES BE NECESSARY IN THE DRAWINGS OR SPECIFICATIONS TO MAKE THE WORK COMPLY WITH THESE REQUIREMENTS, THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER. CIRCUITS SHOWN ON PLANS ARE TO DETERMINE LOAD DATA AND PANEL SIZE. EQUIPMENT SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL).
 - CONTRACT INCLUDES INSTALLING ELECTRICAL CONDUIT AND CONNECTIONS TO FLOW METERS. FLOW METER 2 REQUIRES INSTALLATION OF AN OUTDOOR ENCLOSURE WITH THE AMPLIFIER, SNAP SWITCH DISCONNECT INSTALLED INSIDE AND MOUNTED TO A SUPPORT POST. INSTALLED A LOCAL SERVICE OUTLET MOUNTED TO FLOW METER 2 BEFORE THE SNAP SWITCH.
 - CONTRACTOR TO INSTALL A COMPLETE ELECTRICAL SYSTEM FOR LIGHT AND POWER FROM THE POINT OF SERVICE OF THE POWER COMPANY TO AND THROUGH THE MAIN SERVICE DISCONNECT, DISTRIBUTION PANELS, AND BRANCH PANELS. INCLUDING ALL OUTLETS, DEVICES AND EQUIPMENT FURNISHED BY OTHERS AS MAY BE REQUIRED. UNTIL WORK IS COMPLETE, COST OF ALL POWER CONSUMED DURING CONSTRUCTION SHALL BE PAID BY THE PARTY DESIGNATED BY THE PRIME CONTRACTOR.
 - CONTRACTOR MUST COORDINATE WITH FPL FOR A NEW 480/277V 3 PHASE SERVICE BEING RAN FROM THE WEST SIDE OF 66TH ST ACROSS THE STREET AND CANAL A TO A NEW SERVICE TRANSFORMER SHOWN ON THE PLAN VIEW AND FOR INSTALLATION OF METER. ALSO SUPPLY A 240/120V SINGLE PHASE SERVICE TRANSFORMER FROM THE EXISTING FPL DISTRIBUTION LINE LOCATED ON THE NORTH SIDE OF 53RD STREET.
 - PROVIDE AND MAINTAIN A CLEAR WORKING SPACE ABOUT ELECTRIC EQUIPMENT IN ACCORDANCE WITH NEC ARTICLES 110.26 AND 110.34. AND TO BE PROPERLY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR.
 - PROVIDE CIRCUIT BREAKERS WITH UL LISTED INTERRUPTING RATING (RMS SYMMETRICAL AMPERES) GREATER THAN THE AVAILABLE FAULT CURRENT SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM. ALL SUB-FEED BREAKERS ALLOWED TO BE SERIES RATED AT 10KA
 - BOND RACEWAYS AND THE FRAMES AND ENCLOSURES OF MOTORS, BREAKERS, SWITCHES, AND OTHER ELECTRICAL EQUIPMENT TO THE BUILDING GROUNDING SYSTEM. INSTALL AN INSULATED EQUIPMENT GROUND CONDUCTOR IN EACH RACEWAY OR CONDUIT.
 - CONTRACTOR TO MAKE NECESSARY PROVISIONS FOR THE INSTALLATION OF TELEPHONE SYSTEM INCLUDING RACEWAYS, CABINETS, PULL BOXES AND OUTLETS.
 - METAL FRAMING MEMBERS SHALL BE BONDED TO THE EQUIPMENT GROUNDING CONDUCTOR FOR ANY CIRCUIT THAT MAY ENERGIZE THE BUILDING FRAMING AND BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, TABLE 250.122. FOR THE PURPOSE OF THIS REQUIREMENT, A GROUNDED METAL OUTLET BOX ATTACHED TO THE FRAMING SHALL BE PERMITTED.
 - IDENTIFY NEW BRANCH CIRCUITS AT THE PANEL AND AT THE LOAD OUTLET, RECEPTACLE AND SWITCH. IDENTIFY THE PURPOSE OF INDIVIDUAL CIRCUIT BREAKERS, SAFETY SWITCHES AND MOTOR STARTERS BY MEANS OF NAMEPLATES AS INDICATED.
 - ROUTE CONDUITS TO SUIT EQUIPMENT AND BUILDING STRUCTURE. UNLESS OTHERWISE NOTED ON DRAWINGS OR NOT ALLOWED BY THE AHJ THE FOLLOWING SHALL APPLY: CONDUIT FOR ABOVE GRADE SHALL BE INTERMEDIATE METAL CONDUIT (IMC), RIGID METAL CONDUIT (RMC) OR ELECTRICAL METALLIC TUBING (EMT). OPTIONAL: RIGID PVC CONDUIT CAN BE USED EXCEPT WHERE NOT ALLOWED PER CODE SUCH AS THEATER & ASSEMBLY LOCATIONS WITHOUT CONCEALED 15-MINUTE FINISH RATING OR DUCT/PLENUMS AND OTHER AIR-HANDLING DEVICES. LIMIT THE USE OF EMT TO AREAS WHERE IT WILL NOT BE SUBJECT TO PHYSICAL DAMAGE, WET ENVIRONMENTS, OR CORROSION. USE IMC, RMC OR RIGID PVC SCH 40 FOR WORK EMBEDDED IN CONCRETE. ALL BURIED CONDUIT SHALL BE RIGID PVC SCH 40. GENERAL POWER AND LIGHTING HOME RUN CIRCUITS IN CONDUIT (IMC, RMC, EMT) WHEN RAN ABOVE CEILINGS (EXPOSED AND CONCEALED) SHALL BE RAN TO A JUNCTION BOX. METAL CLAD CABLE (MC) WILL BE PERMITTED FROM THE JUNCTION BOX DROPPED DOWN TO THE RECEPTACLE OUTLET OR SWITCH AT A MAXIMUM LENGTH OF 30 FEET. FLEXIBLE METAL CONDUIT OR MC CABLE MAY BE USED FOR TAP CONDUCTORS PER CODE FROM THE FIXTURES TERMINATION TO AN OUTLET BOX IN ACCESSIBLE CEILINGS. CONDUIT TERMINATIONS AT ELECTRICAL EQUIPMENT SUCH AS ELECTRIC MOTORS AND HEATERS SHALL BE MADE USING LIQUID-TIGHT, FLEXIBLE METAL CONDUIT. USE MINIMUM 3/4 INCH CONDUIT EXCEPT AS FOLLOWS: 1/2" CONDUIT MAY BE USED FOR 20 AMP GENERAL LIGHT AND POWER CIRCUITS AND FOR CONTROL CIRCUITS. CONDUIT EXPANSION FITTINGS AND GROUND BONDING JUMPERS SHALL BE INSTALLED ON ALL CONDUITS PASSING THROUGH BUILDING EXPANSION JOINTS TO PROVIDE MOVEMENT IN THE CONDUIT SYSTEM. WHERE GROUPS OF CONDUITS TERMINATE TOGETHER OR PASS THROUGH FLOORS, PROVIDE TEMPLATE TO HOLD CONDUITS IN PROPER RELATION TO EACH OTHER AND TO BUILDING.
 - OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
 - DISCONNECT SWITCHES SHALL BE H.P. RATED, HEAVY DUTY, QUICK MAKE, QUICK BREAK, WITH ENCLOSURES AS REQUIRED BY EXPOSURE.
 - SEAL AROUND CONDUIT PENETRATIONS THROUGH INTERIOR WALLS AND FLOORS SEPARATING AREAS TO RESTORE SEAL PENETRATIONS THROUGH ROOF AND EXTERIOR WALLS TO MAKE WATERPROOF. REQUEST INSPECTION OF FIRE SEALS BY ELECTRICAL INSPECTOR FROM AUTHORITY HAVING JURISDICTION BEFORE AND AFTER PLACEMENT OF FIRE SEAL MATERIALS.
 - WHEN ANY TYPE OF ELECTRICAL BOXES ARE LOCATED IN VERTICAL FIRE-RESISTIVE ASSEMBLIES, (CLASSIFIED AS FIRE/SMOKE AND SMOKE PARTITIONS), SUCH BOXES SHALL BE TESTED FOR USE IN FIRE RESISTIVE ASSEMBLIES AND INSTALLED IN ACCORDANCE WITH THE TESTED ASSEMBLY. ALL OF THE FOLLOWING CONDITIONS SHALL BE MET WITHOUT THE NEED FOR "PUDDY PADS":
 - USE STEEL ELECTRICAL BOXES THAT DO NOT EXCEED 16 SQ. IN. IN AREA, PROVIDED THAT THE AREA OF SUCH OPENINGS DOES NOT EXCEED 100 SQ. IN. FOR ANY 100 SQ. FT. OF WALL AREA. ANY OUTLET BOXES ON OPPOSITE SIDES OF THE WALL SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 IN. OUTLET BOXES SHALL BE SECURELY FASTENED TO WALL FRAMING MEMBERS AND THE OPENING IN THE GYPSUM BOARD FACING SHALL BE CUT NOT TO EXCEED 1/8 INCH BETWEEN THE EDGES OF THE OUTLET BOX AND THE EDGES OF THE OPENING.
 - USE "PUTTY PADS" IF THE AGGREGATE AREA OF THE BOXES EXCEEDS 100 SQ. IN. FOR ANY 100 SQ. FT. OF WALL AREA, OR IF THE HORIZONTAL SPACING BETWEEN BOXES IS LESS THAN THE REQUIRED 24 IN., OR IF ANY BOX EXCEEDS 16 SQ. IN. IN NO CASE SHALL THERE BE OVERLAPPING OF BACKS ANYWHERE.
 - USE 12 AWG OR LARGER CONDUCTORS FOR POWER WIRING UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS OR SCHEDULE. USE 14 AWG STRANDED CONDUCTORS FOR CONTROL WIRING UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS.
 - USE ONLY COPPER CONDUCTORS ON CIRCUITS 600V AND LESS. CONDUCTORS 10 AWG AND SMALLER SHALL BE SOLID AND 8 AWG AND LARGER AWG SHALL BE STRANDED. PROVIDE TYPE THHN/THWN WIRE INSULATION; XHHW INSULATION MAY BE USED FOR 1 AWG AND LARGER.
 - USE THE FOLLOWING CONDUCTOR COLOR CODES:

120/240V	120A/240V	120V/208V	277Y/480V
PHASE A	BLACK	BROWN	BROWN
PHASE B	RED	ORANGE	RED
PHASE C	BLUE	YELLOW	YELLOW
NEUTRAL	WHITE	WHITE	GRAY
EQUIP. GROUND	GREEN		
 - ISOLATED GROUND SHALL BE GREEN WITH YELLOW TRACER.
 - TEST CONDUCTORS FOR CONTINUITY AND FREEDOM FROM SHORTS AND UNINTENTIONAL GROUNDS.
 - KEEP JOB SITE IN AN ORDERLY CONDITION AND AT PROJECT COMPLETION, REMOVE ALL WASTE.
 - IF DIRECTED BY THE ARCHITECT, THE CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN HIS PROPOSAL, AND THAT HE WILL BE RESPONSIBLE FOR THE APPROVED SATISFACTORY FUNCTIONING OF THE ENTIRE SYSTEM WITHOUT EXTRA COMPENSATION.
 - DO NOT SCALE THE ELECTRICAL DRAWINGS. REFER TO ARCHITECTURAL/CIVIL ENGINEERS PLANS AND ELEVATIONS FOR EXACT LOCATION OF ALL EQUIPMENT. ALWAYS CONFIRM WITH OWNER'S REPRESENTATIVE IF IN DOUBT. ANY QUALITIES SHOW IN SCHEDULES ARE FOR REFERENCE ONLY AND SHALL NOT BE USED AS AN EXACT TAKE OFF. CONTRACTOR IS RESPONSIBLE FOR ALL ACTUAL QUANTITY COUNTS.

TO THE BEST OF THE ENGINEER'S KNOWLEDGE, THESE PLANS AND SPECIFICATIONS COMPLY WITH THE 2017 FLORIDA BUILDING CODE, 2014 INC. AND THE 2017 FLORIDA ELECTRICAL CODE (WITH AMENDMENTS).

DATE: 6/29/20
SHEET: E4
PROJECT NO: TC19032

ISSUE DATE: 6/29/20

WWW.TCE.ENG.PRO

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BID SET

ELECTRICAL SCHEDULES, NOTES, ONE-LINE

MOORHEN MARSH LEAPS
ELECTRICAL SCREENING & PUMPING
OPERATIONS BUILDING
INDIAN RIVER COUNTY FL

ENGINEER CERTIFICATION
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