

# INVITATION TO BID

**18-023**

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**ISTOKPOGA MARSH WATER IMPROVEMENTS PROJECT-  
PHASE 2  
Project No. 14041**

APRIL 2018



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**HIGHLANDS COUNTY BOARD OF  
COUNTY COMMISSIONERS**  
*Purchasing Division*

**DIVISION 0 - SECTION 00010  
INVITATION TO BID ("ITB")  
ITB 18-023**

The Board of County Commissioners ("Board") of Highlands County, Florida ("County") will receive sealed Bids in the Highlands County Purchasing Division ("Purchasing Division") for:

**ITB NO. 18-023      ISTOKPOGA MARSH WATER IMPROVEMENT  
Highlands County Project No. 14041**

Specifications may be obtained by downloading from our website: [www.hbcc.net](http://www.hbcc.net), or [Vendor Registry.com](http://VendorRegistry.com). Please refer any questions to: Chris Davis, Purchasing Manager, 600 S. Commerce Ave., Sebring, Florida 33870, Phone: 863-402-6528 or E Mail: [cmdavis@hbcc.org](mailto:cmdavis@hbcc.org).

**A NON MANDATORY PRE-BID meeting will be held at 10:00 A.M. on Thursday; May 10, 2018**, at the H.L. Bishop Park Clubhouse, 10 Lake June Clubhouse Rd., Lake Placid, FL 33852.

The purpose of this meeting is to provide a forum where the Bidders can further familiarize themselves with the Specifications of the ITB. The public is invited to attend this meeting.

**Site Visit**

A Site Visit will immediately follow the Pre Bid Meeting to provide Contractors access to the property. All other access to the site will need to be arranged through the Purchasing Manager.

A Bidder must demonstrate previous experience per Article 3 of the ITB18-023 SECTION 00100.

Each submittal shall include one (1) original, one (1) exact paper copy and one (1) exact electronic copy (CD or thumb drive) of the Bid submission packet.

**BIDS MUST BE DELIVERED** to the Purchasing Division, 600 S. Commerce Ave., 2<sup>nd</sup> Floor, Sebring, FL 33870, to reach that office no later than **3:00 P.M., Tuesday; May 22, 2018**, at which time they will be opened. The public is invited to attend this meeting. Bid envelopes must be sealed and marked with the ITB number and name to identify the enclosed Bid. Bids received later than the date and time specified will be rejected. The County will not be responsible for the late deliveries of Bids that are incorrectly addressed, delivered in person, by mail or any other type of delivery service.

One or more County Commissioners may be in attendance at the Bid opening and the Pre-Bid meeting.

The Board's Local Preference Policy ("Local Preference Policy") and Women/Minority Business Enterprise Policy ("W/MBE Policy") will not apply to the award of this ITB. All Bidders (Prime Contractors) and lower tier (Subcontracts) are encouraged to utilize MBE/WBE companies and MBE/WBE Utilization Reporting is required. A good faith effort to utilize MBE and WBE's must be documented. See Attachment C for additional information. A listing of MBE/WBE companies in the area is included to assist in this effort.

The County reserves the right to accept or reject any or all Bids or any parts thereof, and the determination of this Award, if an Award is made, will be made to the most responsive and responsible Bidder whose Bid and qualifications indicate that the Award will be in the best interest of the County. The County reserves the right to waive irregularities in the Bid.

A Bidder must submit a Bid on all Work to receive consideration. A Bid Bond or Cashier's Check in an amount of five percent (5%) of the Bid must be included on Bids over one hundred thousand dollars (\$100,000.00). If the successful Bid is greater than two hundred thousand dollars (\$200,000.00), a Public Construction Bond is required. An Irrevocable Letter of Credit may be considered in lieu of the Public Construction Bond depending on its verbiage. The Bidder must be a Licensed General Contractor, Underground Utility Contractor or other appropriate licensed contractor in the State of Florida. The Bid must be accompanied by evidence of the Bidder's qualifications to do business in the State of Florida, in accordance with Chapter 489, Florida Statutes.

The principal features of the Project are:

All work shown on the drawings and included in the Specifications. Generally, this includes all necessary mobilization, demolition, and construction as it relates to the earthwork, pumps station, and water control structures as noted in the scope of work and indicated on the drawings.

The Board does not discriminate upon the basis of any individual's disability status. This non-discrimination policy involves every aspect of the Board's functions, including one's access to, participation, employment or treatment in its programs or activities. Anyone requiring reasonable accommodation as provided for in the Americans with Disabilities Act or Section 286.26, Florida Statutes, should contact Ms. Pamela Rogers, ADA Coordinator at: 863-402-6842 (Voice), or via Florida Relay Service 711, or by e-mail: [progers@hcbcc.org](mailto:progers@hcbcc.org). Requests for CART or interpreter services should be made at least 24 hours in advance to permit coordination of the service.

**Board of County Commissioners, Highlands County, FL**

[www.hcbcc.net](http://www.hcbcc.net)

**DIVISION 0 - SECTION 00100**  
**INSTRUCTIONS TO BIDDERS**  
**ITB 18-023**

**Article 1 - Defined terms**

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated below and in Section 00700 of this ITB which are applicable to both the singular and plural thereof:
- A. Alternative – Amount proposed by Bidder and stated on the Bid Form that will be added to or deducted from the base Bid amount if Engineer decides to accept a corresponding change in either Scope of Work or in products, materials, equipment, systems or installation methods described in Construction Documents.
  - B. Award – The selection by the County of the lowest responsible and responsive Bidder to perform the Work.
  - C. Bid – The Bid Form and other documents submitted by a Bidder in response to this ITB.
  - D. Bidder - The individual or entity who submits a Bid directly to the County.
  - E. Bid Form – Section 00300 of this ITB, which shall be used to submit a Bid.
  - F. Bidding Documents – This ITB, all Addenda to this ITB, and the Construction Documents.
  - G. Board – County’s Board of County Commissioners.  
  
Construction Documents – The construction Drawings and Specifications for the ISTOKPOGA MARSH WATER IMPROVEMENT PROJECT PHASE 2; COUNTY PROJECT NO. 14041
  - H. County Attorney – The County’s County Attorney.
  - I. County Engineer – The County’s County Engineer.
  - J. County or Owner –Highlands County, a political subdivision of the State of Florida.
  - K. Engineer – The Engineer of Record.
  - L. Project Manager – The County Project Manager
  - M. Purchasing Division - The County’s Purchasing Division, which issues Bidding Documents and administers the bidding procedures.
  - N. Sites – The Sites described and depicted in the Construction Documents.
  - O. Work – The Work described and depicted in the Construction Documents.

**Article 2 - Copies of Bidding Documents**

- 2.01 Complete sets of the Bidding Documents in the number stated in the Advertisement or this ITB may be obtained from the Purchasing Division web site or [www.VendorRegistry.com](http://www.VendorRegistry.com).

- 2.02 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Project Manager assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Project Manager in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

### **Article 3 - Qualifications of Bidders**

- 3.01 The Bidder must self-perform at least 25% of the work contained in this project. To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit detailed written evidence with the Bid Form as follows:
  - A. A list of a minimum of three (3) projects that the Bidder has performed within the past seven (7) years which are of equal magnitude and complexity as the type of work to be done for the Owner. The list should include the name of the entity, complete address, name, phone number, fax, and email of a responsible individual qualified to respond to questions concerning the Bidder's abilities, costs, schedules, etc. Prior successful, on-time accomplishment of such equal work will be a consideration in determining whether the Bidder is qualified to perform the Work.
  - B. Supervisory and staffing capabilities with resumes of the supervisory personnel and planned for the Work, and the number and classification of personnel required per shift.
  - C. List of equipment available for use on this Project. Identify if equipment is owned or leased.
  - D. Each Bid must contain evidence of Bidder's qualification to do business in the State of Florida, in accordance with Chapter 489, Florida Statutes. (Copies of Licenses and Certificates)
- 3.02 In addition, to demonstrate Bidder's qualifications to perform the Work, within ten (10) days and prior to Notice of Award, Bidder shall submit detailed written evidence such as financial data (note if financial data is considered confidential it must be marked as such) and other such data as may be called for below:
  - A. A listing of all Subcontractors is required where the subcontract value exceeds ten percent (10%) of the total contract amount. Provide experience statements for these Subcontractors.
  - B. List of present commitments (workload), including name of project, location, and value of contract.

### **Article 4 - Examination of Bidding Documents, Other Related Data, and Sites**

- 4.01 Subsurface and Physical Conditions known to Owner are shown in the Construction Documents.
- 4.02 Underground Facilities known to Owner are shown on the Construction Documents. No Site specific utility locates have been done.

- 4.03 No Hazardous Environmental Condition has been identified at the Sites.
- 4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in Paragraphs 5.03, 5.04 and 5.05 of Section 00700 Standard General Conditions of the Construction Contract as modified in Section 00800 Supplementary Conditions of the Contract Documents. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to Hazardous Environmental Conditions at the Sites, if any, and possible changes in the Contract Documents due to Hazardous Environmental Conditions uncovered or revealed at the Sites which were not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in Paragraph 5.06 of Section 00700 Standard General Conditions of the Construction Contract as modified in Section 00800 Supplementary Conditions of the Contract Documents.
- 4.05 On request, the Purchasing Division will provide Bidder access to Sites to conduct such examinations, investigations, explorations, tests, and studies, as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests, and studies.
- 4.06 On request, the Purchasing Division will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other work.
- 4.07 It is the responsibility of each Bidder before submitting a Bid to:
- A. Examine and carefully study the Bidding Documents, including any Addenda and the other related data identified in the Bidding Documents;
  - B. Visit the Sites and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
  - C. Become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;
  - D. Carefully study all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Sites;
  - E. Obtain and carefully study (or assume responsibility for doing so) all additional or supplementary examinations, investigations, explorations, test, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Sites 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 any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;

- F. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Document;
- G. Become aware of the general nature of the Work to be performed by Owner and others at the Sites that relates to the Work as indicated in the Bidding Document;
- H. Correlate the information known to Bidder, information and observations obtained from visits to the Sites, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;
- I. Promptly give Engineer and the Purchasing Division written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer and the Purchasing Division is acceptable to Bidder; and
- J. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer and the Purchasing Division written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer and the Purchasing Division are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

#### **Article 5 - Pre-Bid Meeting**

5.01 There will be a NON MANDATORY Pre-Bid Meeting as specified in ITB Section 00010 Invitation to Bid.

#### **Article 6 - Sites and Other Areas**

6.01 The Site is identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work is to be obtained and paid for by the Contractor. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents.



## **Article 7 - Interpretation and Addenda**

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be directed to the Purchasing Division. Interpretations or clarifications considered necessary by the Purchasing Division and Project Manager in response to such questions will be issued by Addenda and will be mailed, emailed, or delivered to all parties recorded by the Purchasing Division as having received the Bidding Documents and having attended the Pre-Bid Meeting. Requests for Information (RFI) received after the set date may not be answered. Only RFI answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner, Engineer or the Purchasing Division.
- 7.03 Addenda will be posted to the County's website; [www.hcbcc.net](http://www.hcbcc.net). It is the sole responsibility of the Bidder to frequently check the County's website for Addendums.

## **Article 8 - Bid Security**

- 8.01 A "Bid Bond" or Cashier's Check, in the amount of five percent (5%) of the Bid, must be included on each Bid over one hundred thousand dollars (\$100,000.00). If the successful Bid is greater than two hundred thousand dollars (\$200,000.00), a "Public Construction Bond" of not less than one hundred percent (100%) of the Awarded Bid amount will be required. All Bonds must be in a form acceptable to Owner and County Attorney.
- 8.02 Within thirty (30) days after the Award, Owner will return the bid securities to all Bidders whose Bids are not to be further considered in awarding the Contract. Retained bid securities will be held until the Agreement has been finally executed, after which all bid securities, other than Bidder's bond and any guarantees which have been forfeited, will be returned to the respective Bidders whose Bids they accompanied.

## **Article 9 - Contract Times**

- 9.01 The number of days within which, or the dates by which, the Work is to be (a) Substantially Completed and, (b) also completed and ready for final payment are set forth in the Bid Form.

## **Article 10 - Liquidated Damages**

- 10.01 Provisions for liquidated damages, if any, are set forth in the Agreement.

## **Article 11 - Substitute or 'Or-Equal' Items**

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment described in the Bidding Documents with consideration of possible substitute or "or-equal" items if allowed within the Bidding Documents. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will be considered by Engineer during the allotted time frame for Request for Information (RFI).

## **Article 12 - Subcontractors, Suppliers and Others**

- 12.01 The apparent successful Bidder, and any other Bidder so requested, shall within five (5) days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identifications are required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner, Project Manager or the Purchasing Division after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent successful Bidder to submit a substitute, without an increase in the Bid.
- 12.02 If the apparent successful Bidder declines to make any such substitution, Owner may Award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner, Project Manager or the Purchasing Division makes no written objection prior to giving of the Notice of Award will be deemed acceptable to all indicated parties subject to revocation of such acceptance after the Effective Date of the Contract as provided in Paragraph 7.06 of Section 00700 Standard General Conditions of the Construction Contract as modified in Section 00800 Supplementary Conditions of the Contract Documents.
- 12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.
- 12.04 It is the responsibility of the Contractor to insure that all Subcontractors comply with all insurance requirements.

## **Article 13 - Bid Form**

- 13.01 Bidder shall use and/or make necessary copies of Section 00300 "Bid Form" of this ITB for their Submittal Document(s).
- 13.02 All blanks on the Bid Form shall be completed by printing in black ink or by typewriter and the Bid Form shall be signed. A Bid Price shall be indicated for each unit price item listed therein, if applicable, or the words "No Bid", "No Change", or "Not Applicable" entered. All names shall be typed or printed below the signature line with all signatures in blue ink.
- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.
- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership and state of organization and type of partnership shall be shown below the signature.

- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown below the signature.
- 13.06 A Bid by an individual shall show the Bidder's name and official address, telephone number, fax number, and email address.
- 13.07 A Bid by a joint venture shall be executed by each joint venture in the manner indicated on the Bid Form. The official address of the joint venture must be shown below the signature.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.09 All Bid Forms shall have the name, official address, telephone number, fax number, and email address for communications regarding the Bid.
- 13.10 Attachments to the Bid Form shall include the following:
- A. Documentation as required in Article 3 of this Section including a copy of Contractors License.
  - B. All insurance from both Contractor and Subcontractor (if applicable) required to fulfill the obligations of this Project.
  - C. Certifications from Section 00160, signed and notarized.
  - D. Any required bond.

#### **Article 14 - Basis of Bid; Evaluation of Bids**

- 14.01 Bidders shall submit a Lump Sum Bid Price which will be the basis for the award. A Unit Price as noted on the Bid Form for the Work listed is required but shall not be used for determining Bid award.
- 14.02 The Lump Sum Bid Price and all unit prices shall include such amounts as the Bidder deems proper for overhead and profit.

#### **Article 15 - Submittal of Bid**

- 15.01 Each prospective Bidder is furnished one copy of the Bidding Documents and if required, the Bid Bond Section 00410 of this ITB. An unbound copy of the Bid Form is to be completed and submitted with the bid security and the following data:
- A. A current copy of Bidder's Certificate of Insurance and a statement of Bidder's ability to acquire the insurance limits and requirements stated in Paragraphs 6.2 and 6.3 of Section 00700 Standard General Conditions of the Construction Contract as modified in Section 00800 Supplementary Conditions of the Contract Documents.
  - B. An executed Statement of Indemnification.
  - C. Acknowledgement of Addenda (if applicable).

- D. All documentation from Subcontractors (if applicable) including their ability to acquire the insurance limits and requirements stated in Paragraphs 6.2 and 6.3 of Section 00700 Standard General Conditions of the Construction Contract as modified in Section 00800 Supplementary Conditions of the Contract Documents.

15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or Invitation to Bid and shall be enclosed in an opaque envelope, plainly marked with the Bid # / Project Title; (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation BID ENCLOSED – ITB 18-023 ISTOKPOGA MARSH WATER IMPROVEMENT PH. 2; HIGHLANDS COUNTY PROJECT 14041. A mailed Bid shall be addressed to the Highlands County BCC; Attn: Purchasing Division, 600 S Commerce Ave., 2<sup>nd</sup> Floor, Sebring, FL 33870.

#### **Article 16 - Modification and Withdrawal of Bids**

16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of the Bids.

#### **Article 17 - Opening of Bids**

17.01 Bids will be opened at the time and place indicated in the advertisement or ITB Section 00010 and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids by means of a copy of the “Bid Opening Sheet.”

#### **Article 18 - Bids to Remain Subject to Acceptance**

18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form and as allowed by Section 119.071, Florida Statutes, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to the end of this period.

#### **Article 19 - Award of Contract**

19.01 All work for this ITB will be awarded to one (1) Bidder.

19.02 Owner reserves the right to reject any or all Bids, including without limitation, non-conforming, non-responsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder that it finds, after reasonable inquiry and evaluation, to be non-responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an Award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.

- 19.03 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause of disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 19.04 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternatives, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
  - B. In the comparison of Bids, alternatives will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner shall announce to all Bidders a “Base Bid plus alternatives” budget after receiving all Bids, but prior to opening them. For comparison purposes alternatives will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to the Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.
  - C. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
  - D. In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or the entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as required by Article 12 of this Section 00100.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.
- 19.06 If the Contract is to be awarded, Owner will Award the Contract to the Bidder whose Bid is determined to be the most advantageous to Owner, taking into consideration those Bids in compliance with the requirements as set forth in this ITB.
- 19.07 Within thirty-five (35) days after the opening of Bids, unless otherwise stated in this ITB, Owner will accept one of the Bids or will act in accordance with these Instructions to Bidders or the Section 00250 General Terms and Conditions for Construction Projects. The acceptance of the Bid will be by written Notice of Intent of Award with an attached copy of the signed Bid tabulation, emailed, mailed or delivered to the office designated in the Bid, with a copy to all other Bidders. In the event of failure of the lowest responsible qualified Bidder to sign and return the Agreement, as prescribed herein, Owner may Award to the next lowest responsible and responsive qualified Bidder. Such Award, if made will be made within ninety (90) days after opening Bids.

## **Article 20 - Insurance**

- 20.01 When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required Certificate of Insurance.

## **Article 21 - Signing of Agreement**

- 21.01 When Owner gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents, which are identified in the Agreement attached thereto. Within fifteen (15) days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached Contract Documents to Owner. Within thirty (30) days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder.

## **Article 22 - Retainage**

- 22.01 Provisions concerning retainage are set forth in the Contract Documents.

## **Article 23 - Designated Contacts and Request for Information (RFI) Deadline**

- 23.01 All questions regarding this ITB must be submitted in writing to:

Chris Davis  
HCBCC Purchasing Manager  
600 S Commerce Ave, Sebring, Florida 33870  
Phone: (863) 402-6528  
Email: cmdavis@hcbcc.org

- 23.02 The deadline to submit questions is 5 P.M. on Monday May 14, 2018. The County will release responses in the form of an Addendum to all Vendors registered on Vendor Registry.com that download documents for this project. The Addendum(s) will be posted to the County's website: [www.hcbcc.net](http://www.hcbcc.net).

## **Article 24 - Direct Material Purchase Procedure**

- 24.01 The Owner and the Contractor will utilize the Direct Material Purchase Procedure of Paragraph 7.09 of Section 00700 Standard General Conditions of the Construction Contract as modified in Section 00800 Supplementary Conditions of the Contract Documents.

**DIVISION 0 - SECTION 00250**  
**GENERAL TERMS AND CONDITIONS FOR CONSTRUCTION PROJECTS**  
**ITB 18-023**

- A. All Bidding Documents shall become the property of the County.
- B. Compliance with Florida Statutes
  - Section 287.087, on Drug Free Workplace,
  - Section 287.133(2)(a), on Public Entity Crimes,
  - Section 287.134, on Discrimination, and
  - Section 287.135, Prohibiting contracting with scrutinized companies is required.
- C. Compliance with E- Verify

**FLORIDA STATUTES**

1. Section 287.087, Florida Statutes. Preference to businesses with drug free workplace programs. In order to have a drug free workplace program, a business shall:
  - a. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
  - b. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
  - c. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).
  - d. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893, Florida Statutes, or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
  - e. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community by, any employee who is so convicted.
  - f. Make a good faith effort to continue to maintain a drug free workplace through implementation of this section.



2. Section 287.133, Florida Statutes. Public entity crime; denial or revocation of the right to transact business with public entities:
  - (2)(a) A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted vendor list.
3. Section 287.134, Florida Statutes. Discrimination; denial or revocation of the right to transact business with public entities:
  - (2)(a) An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity.
4. Section 287.135, Florida Statutes. Prohibition against contracting with scrutinized companies:
  - (2) A company is ineligible to, and may not, bid on, submit a proposal for, or enter into or renew a contract with an agency or local governmental entity for goods or services of \$1 million or more if at the time of bidding or submitting a proposal for a new contract or renewal of an existing contract, the company:
    - (a) Is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, or is engaged in a boycott of Israel;
    - (b) Is on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, created pursuant to Section 215.473, Florida Statutes.
    - (c) Is engaged in business operations in Cuba or Syria.
  - (5) At the time a company submits a bid or proposal for a contract or before the company enters into or renews a contract with an agency or governmental entity for goods or services of \$1 million or more, the company must certify that the company is not participating in a boycott of Israel, on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or that it does not have business operations in Cuba or Syria.



5. CERTIFICATIONS OF COMPLIANCE WITH THE ABOVE-REFERENCED STATUTES ARE LOCATED ON SECTION 00160, AND MUST BE INCLUDED WITH THE BID, SIGNED AND NOTARIZED.
- C. Bids are due and must be received in accordance with the instructions given in Section 00100 of this ITB.
  - D. Owner will not reimburse Bidder(s) for any costs associated with the preparation and submittal of any Bid.
  - E. Bidders, their agents and associates shall NOT solicit any County official. Bidders, their agents and associates shall NOT contact any County official other than the individual(s) listed in Article 23 of Section 00100 of this ITB for additional information and clarification.
  - F. Due care and diligence have been exercised in the preparation of this ITB and all information contained herein is believed to be substantially correct; however, the responsibility for determining the full extent of the service required rests solely with those making response. Neither Owner nor its representatives shall be responsible for any error or omission in the Bids submitted, nor for the failure on the part of the Bidders to determine the full extent of the exposures.
  - G. All timely responses meeting the specifications set forth in this ITB will be considered. However, Bidders are cautioned to clearly indicate any deviations from these specifications. The terms and conditions contained herein are those desired by Owner and preference will be given to those Bids in full or substantially full compliance with them.
  - H. Each Bidder is responsible for full and complete compliance with all laws, rules and regulations including those of the Federal Government, the State of Florida and the County of Highlands. Failure or inability on the part of the Bidder to have complete knowledge and intent to comply with such laws, rules and regulations shall not relieve the Bidder from its obligation to honor its Bid and to perform completely in accordance with its Bid.
  - I. County, at its discretion, reserves the right to waive minor informalities or irregularities in any Bids, to reject any and all Bids in whole or in part, with or without cause, and to accept that Bid, if any, which in its judgment will be in its best interest.
  - J. Award will be made to the Bidder whose Bid is determined to be the most advantageous to Owner, taking into consideration those Bids in compliance with the requirements as set forth in this ITB. The Board reserves the right to reject any and all Bids for any reason or make no Award whatsoever or request clarification of information from the Bidders.
  - K. Any interpretation, clarification, correction or change to this ITB will be made by written addendum issued by the Purchasing Division. Any oral or other type of communication concerning this ITB shall not be binding.
  - L. Bids must be signed by an individual of the Bidder's organization legally authorized to commit the Bidder to the performance of the product(s) and/or service(s) contemplated by this ITB.
  - M. The insurance requirements of Paragraphs 6.02, 6.03, and 6.06 of the Standard General Conditions, as amended by the Supplementary Conditions, found in Sections 00700 and 00800 of this ITB must be satisfied before delivery of goods and performance of services.

- N. If submitting a Bid for more than one ITB, each Bid must be in a separate envelope and correctly marked. Only one (1) Bid per project shall be accepted from any person, corporation or firm. Modifications will not be accepted or acknowledged.
- O. If the successful Bid is greater than two hundred thousand dollars (\$200,000.00), a Public Construction Bond will be required. Awarded Bidder must record Public Construction Bond at the Clerk's Recording Department and comply with Section 255.05, Florida Statutes. All Bonds must be in a form acceptable to Owner and County Attorney.
- P. Each Bid must contain proof of enrollment in E-Verify. See certification in Section 00160.
- Q. Board policy prohibits any County employee or members of their family from receiving any gift, benefit, and/or profit resulting from any contract or purchase. Board policy also prohibits acceptance of gifts of any kind except advertising novelties valued less than ten dollars (\$10.00).
- R. Construction Projects that are awarded for less than two hundred thousand dollars (\$200,000.00) and without a Public Construction Bond require the following:
  1. At any time prior to final completion of the Contract, Owner will not authorize or make payment to the Contractor in excess of ninety percent (90%) of the amount due on the Contract on the basis of the Work suitably completed.
  2. In case of the default by the Contractor, the laborers, materialmen, and Subcontractors, as defined in Section 713.01, Florida Statutes, making claims for unpaid bills, may be paid from the ten percent (10%) retainage.
  3. The final payment of retainage shall not be made until: (1) the Project has been inspected by the Project Manager or other person designated by the County for the purpose; (2) Project Manager or other designated person has issued a written certificate that the Project has been constructed in accordance with the approved Construction Documents and approved Change Orders; (3) the County has accepted the Project; and (4) the Contractor has supplied the County with signed and dated statements from all laborers, materialmen, and subcontractors as defined in Section 713.01, Florida Statutes, and identified under paragraph 5 of this section R, that they have no claims against the Contractor for the Work under the Contract. Said statements shall identify the Project by name and Project number.
  4. The Contractor, before beginning Work or within two (2) workdays thereafter, shall post in a conspicuous place on the Site the following notice.

"Notice is hereby made to all those concerned and affected that

\_\_\_\_\_ (Contractor's Name) is performing the  
 ISTOKPOGA MARSH WATER IMPROVEMENT PROJECT, -PHASE 2  
 Highlands County Project No. 14041

All parties furnishing labor and/or materials to said project must,  
 within twenty (20) days of first providing such labor and/or materials,  
 deliver notice of such in writing, by certified mail, returned receipt requested, to:

HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS  
ROAD AND BRIDGE DEPARTMENT  
ATTN: CLELL FORD  
4344 GEORGE BLVD., SEBRING, FLORIDA 33875

5. The Contractor shall provide a certified list of all Subcontractors, laborers, and material suppliers to the Owner or Designee within thirty (30) days of receiving the Notice to Proceed with the Work. This list shall be updated thereafter each month with a certified statement that the list and its updates include the names and address of all of those Subcontractors, laborers, and material suppliers furnishing labor and/or material for the Project.
  6. The Contractor shall provide a written statement with each pay request to the Project Manager which indicates how each payment will be distributed. This pay request breakdown shall define the disbursement intended for all the funds requested. When the Contractor receives any payment it shall pay such moneys received to each Subcontractor and material supplier as set forth in that written statement.
  7. The Contractor shall provide a written statement with all but the first payment request from each of the Subcontractors, laborers, and material suppliers indicated in paragraph 5 of this Section R that they have in fact received payment as indicated in paragraph 6 of this Section R. In the event a payment is not made as indicated on a prior written statement provided pursuant to paragraph 5 of this Section R, the Contractor shall furnish an explanation as to the reasons for such deviation and shall request approval from the Project Manager.
- S. Late Bids will not be accepted under any circumstances. If Bids are received after the scheduled time of the Bid Opening Meeting, the Bidder will be contacted for disposition. The Purchasing Division, at the Bidder's expense, can return the unopened envelope, or, at the Bidder's request, in writing, can destroy it.
- T. Electronically submitted Bids and faxed Bids will not be accepted. Any blank spaces on the required Bid Form or the absence of required submittals or signatures may cause the Bid to be declared non-responsive.
- U. The County is not responsible for correcting any errors or typos made on the Bid response. Incorrect calculations may cause the Bid to be declared non-responsive.
- V. Minority Owned and Women owned businesses must submit a copy of the certificate to receive credit.
- W. The Bidder shall comply with the Florida Sales and Use Tax Law as it may apply to this Contract. The quoted amount(s) shall include any and all Florida Sales and Use Tax payment obligations required by Florida Law of the successful Bidder and/or its Subcontractors or material suppliers.
- X. Public Records: Any material submitted in response to this ITB will become Public Record pursuant to Section 119(1)(b) and (c), Florida Statutes.
- Y. All pages included in or attached by reference to this ITB shall be called and constitute the Invitation to Bid.

**DIVISION 0 - SECTION 00251  
CERTIFICATION PURSUANT TO SECTION 287.135, FLORIDA STATUTES  
ITB 18-023**

**THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR  
OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.**

1. This sworn statement is submitted to the HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS  
by \_\_\_\_\_  
[Print individual's name and title]  
for \_\_\_\_\_  
[Print name and state of incorporation or other formation of the entity submitting this sworn statement]  
whose business address is \_\_\_\_\_ and  
whose Federal Employer Identification Number (FEIN) is \_\_\_\_\_ (hereinafter referred  
to as "Bidder")

2. CERTIFICATION

Bidder hereby certifies that at the time of its Bid the Bidder is not on the Scrutinized Companies that Boycott Israel list created pursuant to Section 215.4725, Florida Statutes, is not participating in a boycott of Israel, is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List and that it does not have business operations in Cuba or Syria.

**THIS CERTIFICATION IS MADE PURSUANT TO SECTION 287.135(5), FLORIDA STATUTES, AND IS, UPON DELIVERY, A PUBLIC RECORD.**

\_\_\_\_\_  
Print Name: \_\_\_\_\_

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_

The foregoing Certification was sworn to before me this \_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by \_\_\_\_\_, as \_\_\_\_\_, the duly authorized officer of \_\_\_\_\_, on its behalf, who is either personally known to me [ ] or has produced \_\_\_\_\_ as identification [ ].

(AFFIX NOTARY SEAL)

\_\_\_\_\_  
Print Name: \_\_\_\_\_  
Notary Public, State of Florida  
Commission No. \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

**CERTIFICATION PURSUANT TO SECTION 287.087, FLORIDA STATUTES  
PREFERENCE TO DO BUSINESS WITH DRUG FREE WORKPLACE PROGRAMS  
ITB 18-023**

**THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER  
OFFICIAL AUTHORIZED TO ADMINISTER OATHS.**

1. This sworn statement is submitted to the HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS

by \_\_\_\_\_

[Print individual's name and title]

for \_\_\_\_\_

[Print name and state of incorporation or other formation of the entity submitting this sworn statement]

whose business address is \_\_\_\_\_ and

whose Federal Employer Identification Number (FEIN) is \_\_\_\_\_ (hereinafter referred to as "Bidder")

2. CERTIFICATION

Bidder hereby certifies that at the time of its Bid the Bidder has a drug free workplace program in place. The program meets the requirements of Section 287.087, Florida Statutes.

**THIS CERTIFICATION IS MADE PURSUANT TO SECTION 287.087, FLORIDA STATUTES, AND IS, UPON DELIVERY, A PUBLIC RECORD.**

\_\_\_\_\_  
Print Name: \_\_\_\_\_ Date: \_\_\_/\_\_\_/\_\_\_

STATE OF FLORIDA  
COUNTY OF \_\_\_\_\_

The foregoing Certification was sworn to before me this \_\_\_ day of \_\_\_\_\_, 20\_\_\_, by \_\_\_\_\_, as \_\_\_\_\_, the duly authorized officer of \_\_\_\_\_, on its behalf, who is either personally known to me [ ] or has produced \_\_\_\_\_ as identification [ ].

(AFFIX NOTARY SEAL)

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Notary Public, State of \_\_\_\_\_

Commission No. \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

**SWORN STATEMENT UNDER SECTION 287.133(3)(A), FLORIDA STATUTES,  
ON PUBLIC ENTITY CRIMES  
ITB 18-023**

**THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER  
OFFICIAL AUTHORIZED TO ADMINISTER OATHS.**

DESCRIPTION OF CONTRACT: \_\_\_\_\_

STATE OF FLORIDA                    }ss  
COUNTY OF \_\_\_\_\_         }

Before me, the undersigned authority, personally appeared \_\_\_\_\_ who, being by me first duly sworn, made the following statement:

1. The business address of \_\_\_\_\_(name of bidder or contractor), is  
\_\_\_\_\_

2. I understand that a public entity crime as defined in Section 287.133 of the Florida Statutes includes a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity in Florida or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or such an agency or political subdivision and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy or material misrepresentation.

3. I understand that "convicted" or "conviction" is defined by the statute to mean a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, non-jury trial, or entry of a plea of guilt or nolo contendere.

4. I understand that "affiliate" is defined by the statute to mean (1) a predecessor or successor of a person or a corporation convicted of a public entity crime, or (2) an entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime, or (3) those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate, or (4) a person or corporation who knowingly entered into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months.

5. Neither the bidder or contractor nor any officer, director, executive, partner, shareholder, employee, member or agent who is active in the management of the bidder or contractor nor any affiliate of the bidder or contractor has been convicted of a public entity crime subsequent to July 1, 1989.

(Draw a line through paragraph 5 if paragraph 6 below applies.)

6. There has been a conviction of a public entity crime by the bidder or contractor, or an officer, director, executive, partner, shareholder, employee, member or agent of the bidder or contractor who is active in the management of the bidder or contractor or an affiliate of the bidder or contractor. A determination has been made pursuant to 287.133(3) by order of the Division of Administrative Hearings that it is not in the public interest for the name of the convicted person or affiliate to appear on the convicted vendor list. The name of the convicted person or affiliate is \_\_\_\_\_.

A copy of the order of the Division of Administrative Hearings is attached to this statement.  
(Draw a line through paragraph 6 if paragraph 5 above applies.)

**THIS SWORN STATEMENT IS MADE PURSUANT TO SECTION 287.133(3)A, FLORIDA STATUTES, AND IS, UPON DELIVERY, A PUBLIC RECORD**

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

On \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Sworn and subscribed before me in the State and County first mentioned above on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

(AFFIX NOTARY SEAL)

Notary Public, State of Florida

Commission No. \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

**CERTIFICATION PURSUANT TO SECTION 287.134, FLORIDA STATUTES  
DISCRIMINATION; DENIAL OR REVOCATION OF THE RIGHT TO TRANSACT BUSINESS WITH  
PUBLIC ENTITIES**

**ITB 18-023**

**THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER  
OFFICIAL AUTHORIZED TO ADMINISTER OATHS.**

1. This sworn statement is submitted to the HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS

by \_\_\_\_\_

[Print individual's name and title]

for \_\_\_\_\_

[Print name and state of incorporation or other formation of the entity submitting this sworn statement]

whose business address is \_\_\_\_\_ and

whose Federal Employer Identification Number (FEIN) is \_\_\_\_\_ (hereinafter referred to as "Bidder")

2. CERTIFICATION

Bidder hereby certifies that at the time of its Bid the Bidder has not been placed on the discriminatory vendor list by the Department of Management Services.

**THIS CERTIFICATION IS MADE PURSUANT TO SECTION 287.134, FLORIDA STATUTES, AND IS, UPON DELIVERY, A PUBLIC RECORD.**

\_\_\_\_\_  
Print Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

STATE OF FLORIDA  
COUNTY OF \_\_\_\_\_

The foregoing Certification was sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by \_\_\_\_\_, as \_\_\_\_\_, the duly authorized officer of \_\_\_\_\_, on its behalf, who is either personally known to me [ ] or has produced \_\_\_\_\_ as identification [ ].

(AFFIX NOTARY SEAL)

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Notary Public, State of Florida

Commission No. \_\_\_\_\_

My Commission Expires: \_\_\_\_\_



**CERTIFICATION OF PARTICIPATION IN THE UNITED STATES CITIZENSHIP AND IMMIGRATION  
SERVICE BUREAU'S E-VERIFY PROGRAM  
ITB 18-023**

**THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER  
OFFICIAL AUTHORIZED TO ADMINISTER OATHS.**

1. This sworn statement is submitted to the HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS

by \_\_\_\_\_

[Print individual's name and title]

for \_\_\_\_\_

[Print name and state of incorporation or other formation of the entity submitting this sworn statement]

whose business address is \_\_\_\_\_ and

whose Federal Employer Identification Number (FEIN) is \_\_\_\_\_ (hereinafter referred to as "Bidder")

2. **CERTIFICATION**

Bidder hereby certifies that at the time of its Bid the Bidder participates in the United States Citizenship and Immigration Services Bureau's E-Verify Program, and does not knowingly employ, hire for employment, or continue to employ an unauthorized alien.

Bidder's E-verify Company ID #: \_\_\_\_\_

**THIS CERTIFICATION IS, UPON DELIVERY, A PUBLIC RECORD.**

\_\_\_\_\_  
Print Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

STATE OF FLORIDA  
COUNTY OF \_\_\_\_\_

The foregoing Certification was sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by \_\_\_\_\_, as \_\_\_\_\_, the duly authorized officer of \_\_\_\_\_, on its behalf, who is either personally known to me [ ] or has produced \_\_\_\_\_ as identification [ ].

(AFFIX NOTARY SEAL)

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Notary Public, State of Florida

Commission No. \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

**DIVISION 0 - SECTION 00300**

**BID FORM**

**ITB 18-023**

PROJECT IDENTIFICATION:

ISTOKPOGA MARSH WATER IMPROVEMENT PH. 2  
Highlands County Project No. 14041

THIS BID IS SUBMITTED TO:

Highlands County Board of County Commissioners  
Attn: Purchasing Division  
600 S Commerce Ave., Sebring, FL 33870

BID SUBMITTED BY:

\_\_\_\_\_  
[Bidding Company's Name, 'Bidder']

\_\_\_\_\_  
[Bidder's Authorized Representative's Name]

\_\_\_\_\_  
[Bidder's Address, Building #, Street]

\_\_\_\_\_  
[Bidder's Address, City, State, Zip]

\_\_\_\_\_  
[Print Contact Person's Name for this bid]

\_\_\_\_\_  
[Contact Person's Email Address]

\_\_\_\_\_  
[Contact Person's Phone Number]

- A. The Bidder proposes and agrees, if this Bid is accepted, to furnish all labor, materials, and equipment to construct and complete the Work according to and as specified or indicated in ITB 18-023 and the Bidding Documents for the Bid Price and within the time periods stated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

B. 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. This Bid will remain subject to acceptance for sixty (60) days after the day of Bid opening. Bidder will sign and deliver the required number of the other documents required by this ITB within fifteen (15) days after the date of County's Notice of Award.

C. In submitting this Bid, Bidder represents that:

1. Bidder has examined and carefully studied the Bidding Documents, including the following Addenda, receipt of all of which is hereby acknowledged:

Date	Number	Date	Number
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. 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, performance, and furnishing of the Work;
3. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, performance, and furnishing of the Work.
4. Bidder acknowledges that County and Project Manager do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the Site. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site or otherwise which may affect cost progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder and safety precautions and programs incident thereto. Bidder does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price, and other terms and conditions of the Contract Documents.
5. Bidder is aware of the general nature of the Work to be performed by County and others at the Site that relates to the Work.
6. Bidder has correlated information known to Bidder, information and observations obtained from visits to the Site and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
7. Bidder has given Project Manager written notice of all conflicts, errors, ambiguities or discrepancies that Bidder has discovered in the Bidding Documents and the written resolution

thereof by Project Manager is acceptable to Bidder, and the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

8. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation 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 person, firm or corporation to refrain from Bidding, and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over County.

D. Documentation included with Bid packet

		Required?	Included (check if yes)
1.	One (1) original (signed in blue ink), one (1) exact paper copy, and one (1) exact electronic copy (CD or thumb drive) of the submitted Bid.	Yes	
2.	Certificates from Section 00160 <ul style="list-style-type: none"> <li>• F.S. 287.135</li> <li>• F.S. 287.087</li> <li>• F.S. 287.133(3)(A)</li> <li>• F.S. 287.134</li> <li>• Participation in E-Verify</li> </ul>	Yes	
3.	Waiver of right to claim against payment/construction bond (Section 00836)	Yes	
4.	Woman or Minority Owned Business Certificate	If applicable	
5.	Qualifications (See Section 00100, Article 3) <ul style="list-style-type: none"> <li>• List of 3 jobs of similar magnitude in prior 7 year period</li> <li>• Resume(s) of Bidder</li> <li>• List of available equipment</li> <li>• Copies of required licenses</li> <li>• List of sub-contractors, if applicable</li> <li>• List of present commitments</li> <li>• Statement of Bidder Qualification</li> </ul>	Yes	
6.	Bid security shown in the form of level or percentage of bonding capacity	Yes	

7.	<ul style="list-style-type: none"> <li>• Disclosure of lobbying Activities</li> <li>• Federal Lobbying Form</li> <li>• Trench Safety Compliance</li> </ul>	Yes	
----	--	-----	--

E. Pricing

1. This is a **Lump Sum Bid**. The Bidder shall provide a lump sum bid price for each of the two categories of work described in the plans and specifications and identified on the bid form below. Bidder will complete the Work in accordance with the Contract Documents for the Lump Sum Bid Price. Award will be based on the Total Lump Sum Bid Price of item a and b and requirements of Bidder.

**Lump Sum Bid**

Bid Item Category	Amount
a. Impoundment and Access Road Lump Sum Bid [in figures]:	\$
Impoundment and Access Road Lump Sum Bid [in words]:	
b. Channel B Improvement including relocation and repair of existing pump station Lump Sum Bid [in figures]:	\$
Channel B Improvement including relocation and repair of existing pump station Lump Sum Bid [in words]:	
<b>TOTAL LUMP SUM PRICE</b>	<b>\$</b>

2. Three tables are provided for the bidder to complete and return to Highlands County with their bid. Tables A and B will be used during the progress of the job for measurement and progress payments. Table C establishes the prevailing unit rates for changes to the scope (addition or subtraction).
  - a. TABLE A - Impoundment Bid Form: To complete Table A, the bidder should provide quantities and unit prices for work items included in their bid. Cost items not listed but a part of the project such as grubbing and dewatering should be included in the items listed.

The total price for the bid items listed should be the total amount of the lump sum bid for this category.

<b>TABLE A - IMPOUNDMENT BID ITEMS</b>					
<b>No.</b>	<b>Items</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Amount</b>
1	Mobilization		EA		\$
2	Construct Access Road		LF		\$ -
3	Construct Dike		LF		\$ -
4	Construct Seepage Ditch		LF		\$ -
5	Construct Dike Perimeter Roads		LF		\$ -
6	Complete Impoundment Internal Work Items		LS		\$ -
7	Construct Emergency Overflow		LS		\$ -
8	Construct Pump Intake Pond		LS		\$ -
9	Pump Station Installation		LS		\$ -
10	Sluice Gate (P-3) Installation		LS		\$ -
11	Culvert P-8 Installation		LS		\$ -
12	Culverts P-4,5,6,7,9,10 Installation		LS		\$ -
13	Structure CS-1 Installation		LS		\$ -
14	Fence (Permanent)		FT		\$ -
15	Gates		EA		\$ -
16	Sod		SF		\$ -
17	Hydro-Seed		SF		\$ -
18	Seed & Mulch		SF		\$ -
<b>Total</b>					<b>\$ -</b>

b. TABLE B - Supply Canal Bid Form: To complete Table B the bidder should provide quantities and unit prices for work items included in their bid. Cost items not listed but a part of the project such as mobilization, grubbing and dewatering should be included in one of the items listed. The total price for the bid items listed should be the total amount of the lump sum bid for this category.

<b>TABLE B - SUPPLY CANAL BID ITEMS</b>					
<b>No.</b>	<b>Items</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Amount</b>
1	Removal of Trees & Brush (Include Burning)		LS		\$ -
2	Excavation of Supply Canal		LF		\$ -
3	Ditch Cleaning		LF		\$ -
4	Construct Maintenance Accesses		LS		\$ -
5	Relocate Existing Pump Station		LS		\$ -

6	Culverts P-1 and P-2 Installation		LS		\$ -
7	Culverts P-11, P-12 and P-13 Installation		LS		\$ -
8	Structures CS-2 to CS-8 plus Culvert P-14 Installation		CY		\$ -
9	Fence (Permanent)		CY		\$ -
10	Gates		CY		\$ -
11	Sod		LS		\$ -
12	Seed & Mulch		LS		\$ -
<b>Total</b>					<b>\$ -</b>

- c. TABLE C - Unit Prices: This table establishes unit prices for work items that are expected to be part of the project. The bidder should enter the cost per unit listed for each of the bid items. Include in the cost any ancillary costs, labor, equipment cost, overhead and profit related to that item which is not listed separately in the table.

<b>TABLE C - UNIT PRICES</b>			
<b>No.</b>	<b>Items</b>	<b>Unit</b>	<b>Unit Price</b>
1	Clearing and Grubbing	SF	
2	Heavy Tree/Brush Removal and Burning	AC	
3	Light Tree/Brush Removal and Burning	AC	
3	Dewatering - Standard	DAY	
4	Well Pointing	DAY	
5	Demucking	CY	
6	Excavation - Standard	CY	
7	Earthfill - Placed and Compacted	CY	
8	Earthfill - Off-Road Hauling	CY	
9	General Dozier/Grader Work	HR	
10	Fine Grading	SF	
11	Shell Rock Placed and Compacted	SF	
12	Fence - Temporary	FT	
13	Fence - Permanent 5 Strand Cattle Fence	FT	
14	Gates - 12' Wide w/ Support Post	EA	
15	Concrete Work - Flat w/ Reinforcing Steel	CY	
16	Concrete Work - Footers & Walls w/ Reinforcing Steel	CY	
17	Riprap, Placed with Geotech Underlayment	CY	
18	Seeding & Mulching	SF	
19	Hydro-Seeding	SF	
20	Sod - Placed	SF	

TABLE C - UNIT PRICES			
21	Water Truck - One Pass	AC	
22	Structure or Culvert Removal - All	EA	
23	Structure or Culvert Installation -30" Dia or Less	EA	
24	Structure or Culvert Installation -36" Dia or More	EA	
25	Electrician Services - Master or Lead Electrician	HR	
26	Electrician Services - Electrician Helper	HR	
27	Electrical Parts and Controls - Cost Plus Basis	%	
28	Additional Materials or Parts - Cost Plus Basis	%	
29	Job Site Welding - Including Welder, Helper and Supplies	HR	
30	General Labor - Miscellaneous Tasks	HR	

- F. Bidder agrees that the Work will be completed by May 31, 2019. The Contract Times will commence to run on the thirteenth (13th) day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty (30) days after the Effective Date of the Agreement.
- G. Communications concerning this Bid have been addressed only to the contacts listed in Article 23 of Section 00100 of ITB 18-023.

Submitted on: \_\_\_\_\_, 20\_\_\_\_\_.

*If Bidder is an Individual*

(SEAL)

Individual's name: \_\_\_\_\_

Signature: \_\_\_\_\_

Doing business as: \_\_\_\_\_

Business address: \_\_\_\_\_

Phone No.: \_\_\_\_\_

*If Bidder is a Partnership*

(SEAL)

Partnership's name: \_\_\_\_\_



State in which organized:

---

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Type of partnership:

---

Name of general partner:

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Signature:

---

Business address:

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Phone No.:

---

If Bidder is a Corporation:

(SEAL)

Corporation's name:

---

State of incorporation:

---

Name of authorized person to sign:

---

Title:

---

Signature:

---

Date of qualification to do business:

---

Attest:

---

Business address:

---

Phone No.:

---

If Bidder is a Joint Venture

(SEAL)

Name 1:

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Signature 1:

---

Address 1:

---

Name 2:

---

Signature 2:

---

Address 2:

Address for receipt of official  
communications:

Phone number for official  
communications:

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(Each joint venturer 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 for an individual or the appropriate form of entity.)

**DIVISION 0 – SECTION 00410**  
**BID BOND**  
**ITB 18-023**

STATE OF FLORIDA COUNTY OF  
HIGHLANDS

KNOW ALL MEN BY THESE PRESENTS, that we \_\_\_\_\_  
(hereinafter called “Principal”), and \_\_\_\_\_ as Surety, (hereinafter called “Surety”),  
are held and firmly bound unto the Highlands County, a political subdivision of the State of Florida  
(hereinafter called “Owner”), in the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_), lawful  
money of the United States of America, for the payment of which sum well and truly to be made, we bind  
ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these  
presents:

WHEREAS, the “Principal” contemplates submitting or has submitted to bid to the said “Owner”  
for Bid No. ITB 18-023.

**ISTOKPOGA MARSH WATER IMPROVEMENT PROJECT - PHASE 2**  
**HIGHLANDS COUNTY PROJECT NO. 14041**

WHEREAS, it was a condition precedent to the submission of said bid that a certified check or  
bid bond in the amount of not less than five percent (5%) of the amount of bid be submitted with said  
bid as a guarantee that the Bidder would, if awarded the contract, enter into a written contract with the  
“Owner” within fifteen (15) consecutive calendar days after having been given notice of award of the  
contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that if the bid of the  
“Principal” herein be accepted and said “Principal”, within fifteen (15) consecutive calendar days after  
notice being given of such acceptance, enter into a written contract with the “Owner”, then this obligation  
shall be void; otherwise, the sum herein stated shall be due and payable to the “Owner”, and the “Surety”  
herein agrees to pay said sum immediately upon demand of said “Owner”, in good and lawful money  
of the United States of America; as liquidated damages for failure thereof said “Principal”.

IN WITNESS WHEREOF, the said \_\_\_\_\_, as "Principal" herein, has caused these presents to be signed in its name by its \_\_\_\_\_ and attested by its \_\_\_\_\_ under its corporate seal, and the said \_\_\_\_\_ as "Surety" herein, has caused these presents to be signed in its \_\_\_\_\_ and attested by its \_\_\_\_\_ under its corporate seal, this \_\_\_\_\_ day of \_\_\_\_\_, A.D. 20 \_\_\_\_\_.

ATTEST:

\_\_\_\_\_

Title: \_\_\_\_\_

CONTRACTOR, AS PRINCIPAL:

\_\_\_\_\_

By: \_\_\_\_\_ (Seal)

Title: \_\_\_\_\_

ATTEST:

\_\_\_\_\_

Title: \_\_\_\_\_

AS SURETY:

\_\_\_\_\_

By: \_\_\_\_\_ (Seal)

Title: \_\_\_\_\_

**SECTION 00420**

**STATEMENT OF BIDDER'S QUALIFICATIONS**

**All questions must be answered** and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

- 1) Name of Bidder.
  
- 2) Permanent main office address, and telephone and fax number.
  
- 3) When organized.
  
- 4) If a corporation, where incorporated.
  
- 5) How many years have you been engaged in the contracting business under your present firm or trade name?
  
- 6) Contracts on hand: (show amount of each contract and the appropriate anticipated dates of completion.)

	<u>Project</u>	<u>Location</u>	<u>Notice to Proceed Date</u>	<u>Completion Date</u>
1)				
2)				
3)				
4)				

- 5)
- 6)
- 7)
- 7) General character of work performed by your company.
- 8) Have you ever failed to complete any work awarded to you? (If yes, explain)
- 9) Have you ever defaulted on a Contract? (If yes, explain)
- 10) List your major equipment available for this Contract.
- 11) Experience in construction work similar to this Project (table attached).
- 12) Background and experience of the principal members of your organization, including the officers. (Attach Resumes)
- 13) List the number of full time employees permanently employed by Contractor in the Contractor's local office by personnel category.

	<u>Labor Classification</u>	<u>Number of Employees</u>
1)	_____	_____
2)	_____	_____
3)	_____	_____
4)	_____	_____
5)	_____	_____
6)	_____	_____
7)	_____	_____
8)	_____	_____
9)	_____	_____
10)	_____	_____

14) Credit available: \$

15) Give bank reference:

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16) Will you, upon request, furnish a detailed financial statement and furnish any other information that may be required by the Owner (Yes/No)

17) Provide a copy of all current, valid construction related licenses you hold (attach). **Note: Bidders who do not hold a current valid General Contractor and/or Utility and Excavation license issued by the State of Florida will be disqualified.**

18) The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at \_\_\_\_\_, this \_\_\_\_\_

day of \_\_\_\_\_, 20\_\_\_\_\_

---

By

\_\_\_\_\_  
Title

State of \_\_\_\_\_) County of \_\_\_\_\_)

\_\_\_\_\_, being duly sworn, deposes and

says that he is \_\_\_\_\_ of \_\_\_\_\_

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and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_,

\_\_\_\_\_  
Notary Public, State of Florida at Large

My Commission Expires:  
\_\_\_\_\_





**SECTION 00500**  
**AGREEMENT**  
**ITB 18-023**

THIS AGREEMENT made this \_\_\_\_ day of \_\_\_\_\_, 2018, by and between Highlands County, a political subdivision of the State of Florida, 600 South Commerce Avenue, Sebring, Florida 33870, hereinafter called "Owner" and \_\_\_\_\_, hereinafter called "Contractor". Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

**Article 1. WORK**

Contractor shall provide all labor, materials, and equipment to construct the ISTOKPOGA MARSH WATER IMPROVEMENTS – PHASE 2; PROJECT No. 14041. Contractor shall complete the Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

The Work consists of two bid items. The first bid item is construction of a "fit-for-purpose" agricultural Above-Ground Impoundment (AGI) on 401 acres owned by Istokpoga Marsh Watershed Improvement District (IMWID), and install a pump station to lift water into the AGI, as well as design and install gravity control structures to allow the release of stormwater back into the IMWID canal system. This impoundment will include pumping station and 2 24" axial flow pumps, berms and seepage canals and will occupy the entirety of the site. The second, separate bid item is the excavation and improvement of existing drainage ditches to convey water from Channel B of the IMWID project approximately 1.5 miles to this AGI.

The principal features, as defined above, are not intended to cover every aspect of the Project details. Contractor shall be responsible for reviewing the Contract Documents to determine the full scope of the Work and specific requirements of the Project, which include familiarity and compliance with all Laws and Regulations.

**Article 2. ENGINEER**

The Engineer of Record (hereinafter called "Engineer") will be Royal Consulting Services, Inc., a Florida corporation registered to transact business in the State of Florida.

**Article 3. CONTRACT TIMES**

3.1 Time is of the essence on this project. Contractor agrees that the Work will be completed by May 31, 2019. The Contract Times will commence to run on the thirteenth (13<sup>th</sup>) day after the Effective Date of this Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty (30) days after the Effective Date of this Agreement.

3.2 Liquidated Damages:

3.2.1 Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 of this Article. In agreeing upon the daily liquidated damages amount stated in this paragraph, Owner and Contractor have considered the original Contract Price stated in Article 4 of this Agreement, the average construction, engineering, and inspection costs experienced by Owner, and anticipated costs of project-related delays and inconveniences to Owner and the public. Owner and Contractor also recognize the delays, expense, and

difficulties involved in proving the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (and not as a penalty) Contractor shall pay Owner Five Hundred Dollars (\$500.00) for each day that expires after the time specified in paragraph 3.1 of this Article until the Work is completed and ready for final payment. Liquidated damages shall be deducted by Owner from any balance due Contractor or, if the balance due Contractor is less than the amount of liquidated damages, Contractor shall pay to Owner the remaining unpaid liquidated damages within thirty (30) days after Owner's invoice is sent to Contractor.

3.2.2 Owner does not waive its right to liquidated damages due under this Agreement by allowing Contractor to continue and to finish the Work, or any part of it, after the expiration of the Contract Time including granted time extensions.

3.2.3 In the case of a default of this Agreement and the completion of the Work by Owner, Contractor and Contractor's surety are liable for the liquidated damages under this Agreement, but Owner will not charge liquidated damages for any delay in the final completion of Owner's performance of the Work due to any unreasonable action or delay on the part of Owner.

**Article 4. CONTRACT PRICE**

4.1 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount shown below for each category completed:

**a. Impoundment and Access Road**

\_\_\_\_\_

(IN WORDS)

\_\_\_\_\_

(USE FIGURES)

**b. Channel B Improvement including Relocation and Repair of existing Pump Station**

\_\_\_\_\_

(IN WORDS)

\_\_\_\_\_

(USE FIGURES)

The total sum of these two categories is an amount of \_\_\_\_\_

Price shall be reduced in the manner described in SC-7.09 of Section 00800 of the Supplementary Conditions of this Agreement.

**Article 5. PAYMENT PROCEDURES**

5.1 Deliverables must be received and accepted in writing by the Engineer prior to reimbursements. Supporting documentation with the invoices must establish that the deliverables were received

and accepted in writing by the Engineer. Contractor may receive progress payments for deliverables based on the Contractor's Schedule of Values and on a percentage of services that have been completed, approved, and accepted to the satisfaction of Owner when properly supported by detailed invoices and acceptable evidence of payment. All costs charged to the Project by Contractor shall be supported by detailed invoices, proof of payments, contracts or vouchers evidencing in proper detail the nature and propriety of the charges.

5.2 Progress Payments; Retainage: Contractor shall deliver Contractor's Applications for Payment to Engineer on or before the third (3<sup>rd</sup>) day of each month. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment as recommended by Engineer, on or about the twenty-sixth (26<sup>th</sup>) day of each month during construction as provided in paragraphs 5.2.1 and 5.2.2 below.

5.2.1 Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but in each case, less the aggregate of payments previously made and less such amounts as Engineer shall determine, or Owner may withhold. Owner will withhold ten percent (10%) of each application for progress payment until the completion of the Work.

90 % of the Work completed.

0 % of materials and equipment not incorporated in the Work (but delivered, suitably stored, and accompanied by documentation satisfactory to the Owner).

5.2.2 Upon Substantial Completion, in an amount sufficient to increase total payments to Contractor to ninety percent (90%) of the Contract Price (with the balance being retainage), less such amounts as Engineer shall determine, or Owner may withhold.

5.3 Final Payment: Upon completion of the Work, Contractor shall notify Owner in writing of the completion. The certification shall state that the Work has been completed in compliance with the Drawings and Specifications. If any deviations are noted from the approved Drawings and Specifications, the certification shall include a list of all deviations along with an explanation that justifies the reason to accept each deviation. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and deviations not accepted by Owner and has delivered to Owner, in accordance with the Contract Documents, schedules, guarantees, Bonds, certificates or other evidence of insurance, certificates of inspection, permits, marked-up record documents, paper final as-built Drawings and Specifications, signed, sealed, and certified by a Professional Surveyor, registered in the State of Florida, and all applicable permits, final releases from Contractor and all Subcontractors and suppliers at every level, all warranties, and all other documents reasonably required by Owner pertaining to the Work, Contractor may make application for final payment.

## **Article 6. CONTRACTOR'S REPRESENTATIONS**

In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

6.1 Contractor has examined and carefully studied the Contract Documents (including any Addenda) and the other related data identified in the ITB No. 18-023 Documents, including "technical data."

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

- 6.3 Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.
- 6.4 Contractor has carefully studied all 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) Contractor acknowledges that such reports and drawings are not Contract Documents and may not be complete for Contractor's purposes. Contractor acknowledges that Owner and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the Site. Contractor has obtained and carefully studied (or assumes responsibility for having done so) all such additional supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto. Contractor does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.
- 6.5 Contractor 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 Contract Documents.
- 6.6 Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports, Drawings and Specifications identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- 6.7 Contractor has not given Engineer written notice of any conflicts, errors, ambiguities or discrepancies that Contractor has discovered in the Contract Documents, and Contractor agrees that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- 6.8 Contractor certifies by signing this Agreement that no Commissioner or employee of the Highlands County Board of County Commissioners has solicited or accepted gratuities, favors, or anything of monetary value from Contractor or parties to subcontracts. Contractor and Subcontractors shall not pay any gratuities, favors, or anything of monetary value to any Commissioner or employee of the Highlands County Board of County Commissioners.

#### **Article 7. CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire Contract between Owner and Contractor concerning the Work consists of the following:

- 7.1 This Agreement (pages 00500-1 to 00500-9, inclusive).
- 7.2 The Standard General Conditions of the Construction Contract, EJCDC C-700 (2013 Edition).
- 7.3 ITB 18-023Section 00800 Supplementary Conditions to EJCDC C-700 (2013 Edition)
- 7.4 Completed Bid Form submitted by \_\_\_[Contractor's name]\_, pages 00300-1 to 00300-9 as Exhibit A.

- 7.5 Drawings as listed in the Drawing Index on the Drawing Index Sheet attached as Exhibit B.
- 7.6 Technical Specifications as listed in the Table of Contents attached as Exhibit C.
- 7.7 Geotechnical Reports attached as Exhibit D
- 7.8 Contract Provisions attached as Exhibit E.
- 7.9 Federal Regulations attached as Exhibit F.
- 7.10 MBE/WBE Utilization Form and directions as Exhibit G.
- 7.11 Addenda No. \_\_\_\_\_ dated \_\_\_\_\_.
- 7.12 Except as expressly otherwise noted in this paragraph and paragraph 7.13 of this Article, there are no Contract Documents other than those listed in paragraphs 7.1 through 7.11 of this Article. In the event of a conflict the provisions of the order of precedence shall be this Agreement, followed by the Supplementary Conditions, followed by EJCDC C-700 (2013 Edition). The Contract Documents may only be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:
  - (a) Written Amendment signed by both parties
  - (b) Change Order signed by both parties
  - (c) Work Change Directive signed by both parties
- 7.13 The requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
  - (a) A Field Order issued by the Engineer
  - (b) Engineer's approval of a Shop Drawing
  - (c) Engineer's written interpretation or clarification

## **Article 8. MISCELLANEOUS**

- 8.1 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by Laws and Regulations), and unless specifically stated to the contrary in any written consent of an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 8.2 Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.
- 8.3 Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

- 8.4 Upon the occurrence of any event of default, all obligations on the part of Owner to make any further payments of funds pursuant to this Agreement shall, if Owner so elects, terminate but Owner may make any payments or parts of payments after the happening of any event of default without thereby waiving the right to exercise any remedy which it may have and without becoming liable to make any further payment.
- 8.5 Contractor certifies by signing this Agreement that no Commissioner or employee of the Highlands County Board of County Commissioners has solicited or accepted gratuities, favors or anything of monetary value from Contractor or parties to subcontracts. Contractor, Subcontractors, and Suppliers shall not pay any gratuities, favors, or anything of monetary value to any Commissioner or employee of the Highlands County Board of County Commissioners.
- 8.6 No funds received pursuant to this Agreement may be expended for lobbying the Legislature, the judicial branch, any state agency, Owner or Owner's elected officials, employees or agents.
- 8.7 By entering into this Agreement, Contractor agrees and promises that, during and after a public emergency, disaster, hurricane, flood, or acts of God, Owner shall be given "first priority" for all goods and services under this Agreement. Contractor agrees to provide all goods and services to Owner during and after the emergency at the terms, conditions, and prices as provided in this Agreement on a "first priority" basis. Contractor shall furnish a twenty-four (24) hour phone number to Owner in the event of such an emergency. Failure to provide the stated priority during and after an emergency shall constitute a breach of Contract and make Contractor subject to sanctions from doing further business with Owner. For purposes of this paragraph, the term "first priority" means priority over all other contracts and agreements between Contractor and any person or entity other than Owner and requires Contractor to deliver the goods and services described in this Agreement to Owner prior to providing those goods and services to any other person or entity during and after the emergency.
- 8.8 Owner shall not be obligated or liable hereunder to any person, organization or entity other than Contractor. No provision in this Agreement is intended to, or shall be construed to, create any third party beneficiary or to provide any rights to any person, organization or entity not a party to this Agreement, including, but not limited to, any citizen or employees of the Owner and/or Contractor.
- 8.9 In no event shall the making by Owner of any payment to Contractor constitute or be construed as a waiver by Owner of any breach of covenant or any default which may then exist, on the part of Contractor, and the making of such payment by Owner while any such breach or default exists shall in no way impair or prejudice any right or remedy available to Owner with respect to such breach or default.
- 8.10 No waiver by either Contractor or Owner with respect to any breach or default of or with respect to any provisions or conditions of this Agreement shall be deemed to constitute a continuing waiver of any other breach or default of or with respect to the same or any other provision or condition of this Agreement. No claim or right arising out of a breach of this Agreement can be discharged in whole or in part by a waiver or renunciation of the claim or right unless the waiver or renunciation is supported by consideration and is in writing signed by the aggrieved party.

- 8.11 This Agreement, including exhibits and amendments, and all matters relating to the validity, interpretation, and performance of this Agreement (whether in contract, statute, tort, or otherwise) shall be governed and construed in accordance with the laws of the State of Florida, without giving effect to principles of conflict of laws. Venue for any legal action shall lie in Highlands County, Florida, and any proceedings to enforce or interpret any provision of the Contract Documents shall be brought exclusively in a court of competent jurisdiction in Highlands County, Florida.
- 8.12 Owner is an Equal Employment Opportunity (“EEO”) employer and as such encourages Contractor to voluntarily comply with EEO regulations with regards to gender, age, race, veteran status, country of origin, and creed. In addition, Contractor or anyone under its employ shall comply with all applicable Laws and Regulations thereby pertaining to the avoidance or appearance of sexual harassment or on the job discrimination. Contractor shall maintain a work environment free of discrimination or unwelcome action of a personal nature. Any subcontracts entered into shall make deference to this clause with the same degree of application being encouraged. When applicable, Contractor shall comply with all new EEO Laws and Regulations.
- 8.13 Contractor must self-perform at least 25% of the Work the remaining may be performed by a Subcontractor or Subcontractors approved in advance, in writing by Engineer.
- 8.14 This Agreement shall be effective upon execution by both parties and shall continue in effect and be binding on the parties until the Project is completed and accepted and payment made by Owner or terminated in accordance with Article 16 of Section 00700 Standard General Conditions of the Construction Contract as modified in Section 00800 Supplementary Conditions of the Contract Documents.
- 8.15 Contractor shall be responsible for all quality control testing requirements and shall make testing results available to the owner and engineer of record.
- 8.16 In the event there is a discrepancy between the language of another section of this Agreement and the Contract Documents, the requirements this Agreement shall govern.

## **Article 9. EMPLOYMENT ELIGIBILITY VERIFICATION**

### 9.1 Definitions. As used in this Article:

- 9.1.1 Employee assigned to this Agreement means an employee who was hired after November 6, 1986, who is directly performing work, in the United States, under this Agreement. An employee is not considered to be directly performing work under this Agreement if the employee
- (a) Normally performs support work, such as indirect or overhead functions; and
  - (b) Does not perform any substantial duties applicable to the Agreement.
- 9.1.2 Subcontract means any contract entered into by a Subcontractor to furnish supplies or services for performance of this Agreement or a subcontract under this Agreement. It includes but is not limited to purchase orders, and changes and modifications to purchase orders.
- 9.1.3 Subcontractor means any supplier, distributor, vendor, or firm that furnishes supplies or services to or for Contractor or another subcontractor.

9.1.4 United States, as defined in 8 U.S.C. 1101(a)(38), means the 50 States, the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands.

9.2 Enrollment and verification requirements.

9.2.1 Contractor must be enrolled in E-Verify at time of Contract award, and Contractor shall use E-Verify to initiate verification of employment eligibility of

(a) All new employees.

(1) Enrolled thirty (30) days or more. Contractor shall initiate verification of employment eligibility of all new hires of Contractor, who are working in the State of Florida, whether or not assigned to this Agreement, within three (3) workdays after the date of hire; or

(2) Enrolled less than thirty (30) days. Within thirty (30) days after enrollment in E-Verify, Contractor shall initiate verification of employment eligibility of all new hires of Contractor who are working in the State of Florida, whether or not assigned to this Agreement, within three (3) workdays after the date of hire; or

(b) Employees assigned to this Agreement. For each employee assigned to this Agreement, Contractor shall initiate verification of employment eligibility, to the extent allowed by the E-Verify program, within thirty (30) days after date of Contract award or within thirty (30) days after assignment to this Agreement, whichever date is later.

9.2.2 Contractor shall comply, for the period of performance of this Agreement, with the requirements of the E-Verify program MOU. Termination of Contractor's MOU and denial access to the E-Verify system by the Department of Homeland Security or the Social Security Administration or the U.S. Citizenship and Immigration Service is an event of default under this Agreement.

9.3 Website. Information on registration for and use of the E-Verify program can be obtained via the Internet at the U.S. Citizenship and Immigration Service's Web site: <http://www.uscis.gov>.

9.4 Individuals previously verified. Contractor is not required by this paragraph to perform additional employment verification using E-Verify for any employee whose employment eligibility was previously verified by Contractor through the E-Verify program.

9.5 Subcontracts. Contractor shall include, and shall require the inclusion of, the requirements of this Article, including this paragraph (9.5) (appropriately modified for identification of the parties), in each subcontract that includes work performed in the United States under this Agreement.

Article 10. COMPLIANCE WITH SECTION 287.135(3)(b), FLORIDA STATUTES

Pursuant to Section 287.135(3)(b), Florida Statutes, Owner may terminate this Contract, at the option of its Board of County Commissioners, if the Contractor is found to have submitted a certification required by Section 287.135(5), Florida Statutes, that is false or if Contractor is placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or if Contractor is or has been engaged in business operations in Cuba or Syria.



Article 11. PUBLIC RECORDS COMPLIANCE

If by providing services to Owner pursuant to this Contract Contractor is a contractor, as defined by Section 119.0701, Florida Statutes, Contractor shall:

- 11.1 Keep and maintain public records required by the County to perform the services.
- 11.2 Upon request of the County's custodian of public records, provide the County with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at the cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.
- 11.3 Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the term of this Contract and following competition of this Contract if Contractor does not transfer the records to the County.
- 11.4 Upon competition of this Contract, transfer to the County, at no cost, all public records in possession of Contractor or keep and maintain public records required by the County to perform the services. If Contractor transfers all public records to the County upon competition of this Contract, Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If Contractor keeps and maintains public records upon completion of this Contract, Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the County upon request from the County's custodian of public records, in a format that is compatible with the information technology systems of the County.

**IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:**

**Gloria Rybinski  
County Public Information Officer  
Telephone Number: 863-402-6836  
E-mail Address: grybinski@hcbcc.net  
Mailing Address: 600 South Commerce Avenue  
Sebring, FL 33870**

(THIS AREA INTENTIONALLY LEFT BLANK)

IN WITNESS WHEREOF, the parties of these presents have executed this Agreement in three (3) counterparts, each of which shall be deemed an original, but all of which constitute the same Agreement, in the year and day first shown and mentioned.

**OWNER: HIGHLANDS COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA,  
BY ITS BOARD OF COUNTY COMMISSIONERS**

\_\_\_\_\_  
R. Greg Harris, Chairman

**Address for giving notices:**  
505 S. Commerce Avenue  
Sebring, Florida 33870-3869

ATTEST:

\_\_\_\_\_  
Robert W. Germaine, Clerk

[SEAL]

**CONTRACTOR:**

**Address for giving notices:**

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

ATTEST:

[CORPORATE SEAL]

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

---

**APPROVED AS TO ADMINISTRATIVE POLICY**

---

Randal Vosburg, County Administrator

**APPROVED AS TO FORM AND LEGAL SUFFICIENCY**

---

Joy Carmichael, County Attorney

**AVAILABILITY OF FUNDS**

---

David Nitz, OMB Manager

**APPROVED AS TO TECHNICAL PROVISIONS**

---

Clinton Howerton, Jr., P.E., County Engineer

**APPROVED AS TO PURCHASING POLICIES**

---

Christine Davis, Purchasing Manager

**APPROVED AS TO RISK MANAGEMENT**

---

Sherri L. Bennett, Risk Mgmt. Coordinator

**APPROVED AS TO PROJECT REQUIREMENTS**

---

W. Kyle Green, Director

**END OF SECTION**

G:\COUNTY\PURCHASING DEPT\ITB 18-023\Final ITB Sections\18-023 - ITB - SECTION 00500 - DRAFT CONTRACT - 042018.docx

**DIVISION 0 - SECTION 00600**  
**PUBLIC CONSTRUCTION BOND**  
**ITB 18-023**  
(Section 255.05(3), Florida Statutes)

Bond No. \_\_\_\_\_

BY THIS BOND, we, \_\_\_\_\_,  
whose principal business address and phone number are \_\_\_\_\_  
(\_\_\_\_\_), as Principal and \_\_\_\_\_, whose principal business  
address and phone number are \_\_\_\_\_ (\_\_\_\_\_), as Surety, are bound to  
Highlands County, a political subdivision of the State of Florida, herein called Owner, whose principal business  
address and telephone number are 600 South Commerce Avenue, Sebring, Florida 33870 (863-402-6500), in  
the sum of \_\_\_\_\_ (\$\_\_\_\_\_), for payment of which we bind ourselves,  
our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the Contract dated \_\_\_\_\_, between Principal and Owner for construction of the ISTOKPOGA MARSH WATER IMPROVEMENT PROJECT – PHASE 2, Highlands County Project No. 14041, that Contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and
2. Promptly makes payments to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, services, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in that Contract; and
3. Pays Owner all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a default by Principal under that Contract; and
4. Performs the Principal's guarantee of all work and materials furnished under that Contract for the time specified in that Contract, then this bond is void; otherwise it remains in full force.

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2) and (10), Florida Statutes.

Any changes in or under the Contract Documents and compliance or noncompliance with any formalities connected with that Contract or the changes does not affect Surety's obligation under this bond.

Dated \_\_\_\_\_, 20\_\_\_\_\_.

AS SURETY:

CONTRACTOR, AS PRINCIPAL:

\_\_\_\_\_

\_\_\_\_\_

By: \_\_\_\_\_  
(As Attorney in Fact)

By: \_\_\_\_\_

Title: \_\_\_\_\_

## **INSTRUCTIONS FOR PUBLIC CONSTRUCTION BOND**

1. A good and sufficient Public Construction Bond, in the penal sum of not less than one hundred percent (100%) of the Contract Price, with a surety company satisfactory to Owner, will be required of Contractor guaranteeing that the Contract, including the various guarantee periods thereunder will be faithfully performed; and that Contractor will promptly make payment to all persons supplying Contractor labor, materials, supplies and services used directly or indirectly by Contractor in the prosecution of the work provided for in the Contract.
2. The surety company furnishing this bond shall be authorized to do business in the State of Florida, shall be in compliance with the provisions of the Florida Insurance Code, shall have twice the minimum surplus and capital required by the Florida Insurance Code, and shall hold a currently valid certificate of authority issued by the United States Department of Treasury pursuant to Title 31, Sections 9304-9308, of the United States Code. The surety company must have a rating of not less than "A-X" by the latest edition of the KEY RATING GUIDE as published by A.M. Best Company, Inc., Ambest Road, Oldwick, NJ 08858.
3. The Attorney-in-Fact (Resident Agent) who executes the Public Construction Bond on behalf of the surety company must attach a notarized copy of his or her power-of-attorney as evidence of his or her authority to bind the surety on the date of execution of the bonds. All signatures must be original. No copied or facsimile signatures will be accepted without authentication as required by County. All Contracts, Public Construction Bond, and respective powers-of-attorney will have the same date.
4. In the event the surety company becomes unsatisfactory to Owner, Owner may at its discretion, require from Contractor an additional or new bond in the same or lessor penal sum, satisfactory to the Owner, and to be conditioned as above required. Upon Contractor's failure to furnish such additional or new bond within ten (10) days from the date of written notice to do so, all payments under the Contract will be withheld until such additional bond is furnished.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

## STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  5. *Bidder*—An individual or entity that submits a Bid to Owner.
  6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
  7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
  8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
  9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
  10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.



37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

## 1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
  1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
  1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
  1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
    - a. does not conform to the Contract Documents; or
    - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
    - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
  1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
  2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### **2.01 *Delivery of Bonds and Evidence of Insurance***

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

### **2.02 *Copies of Documents***

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

### **2.03 *Before Starting Construction***

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
  1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
  2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
  1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
  3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

#### 2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

### **ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE**

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

#### **3.02 *Reference Standards***

- A. Standards Specifications, Codes, Laws and Regulations
  - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

#### **3.03 *Reporting and Resolving Discrepancies***

- A. *Reporting Discrepancies:*
  - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
  - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
  - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
  - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## **ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK**

### 4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

### 4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

### 4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

### 4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

#### 4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
  2. abnormal weather conditions;
  3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
  4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.



- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

**ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS**

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

- 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

### 5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
  - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
  - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
  - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

#### 5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
  2. is of such a nature as to require a change in the Drawings or Specifications; or
  3. differs materially from that shown or indicated in the Contract Documents; or
  4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
    - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
  - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
  - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

#### 5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
    - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
    - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
  - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
    - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
    - d. Contractor gave the notice required in Paragraph 5.05.B.
  - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
  - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
  2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

## ARTICLE 6 – BONDS AND INSURANCE

### 6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

### 6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is



maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

### 6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
  - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
  - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
  2. claims for damages insured by reasonably available personal injury liability coverage.
  3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
    - a. Such insurance shall be maintained for three years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
  2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
  3. Broad form property damage coverage.
  4. Severability of interest.
  5. Underground, explosion, and collapse coverage.
  6. Personal injury coverage.
  7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
  8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
  - 1. include at least the specific coverages provided in this Article.
  - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
  - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
  - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
  - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

#### 6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

#### 6.05 *Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
  - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
  - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
  - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
  6. extend to cover damage or loss to insured property while in transit.
  7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
  8. allow for the waiver of the insurer's subrogation rights, as set forth below.
  9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
  10. not include a co-insurance clause.
  11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
  12. include performance/hot testing and start-up.
  13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

## 6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

## 6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

## **ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES**

### **7.01 *Supervision and Superintendence***

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

### **7.02 *Labor; Working Hours***

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

### **7.03 *Services, Materials, and Equipment***

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
  - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
    - a. in the exercise of reasonable judgment Engineer determines that:
      - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
      - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
      - 3) it has a proven record of performance and availability of responsive service; and
      - 4) it is not objectionable to Owner.
    - b. Contractor certifies that, if approved and incorporated into the Work:
      - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
      - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.



- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

#### 7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
  - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
  - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
  - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    - a. shall certify that the proposed substitute item will:
      - 1) perform adequately the functions and achieve the results called for by the general design,
      - 2) be similar in substance to that specified, and
      - 3) be suited to the same use as that specified.
    - b. will state:
      - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
      - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
      - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
    - c. will identify:
      - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
  - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
  - C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
  - D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
  - E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
  - F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

#### 7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

- O. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
  2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

#### 7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

#### 7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

#### 7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
  - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
  - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
  - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
  - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

#### 7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 7.16 *Shop Drawings, Samples, and Other Submittals*

##### A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*
    - a. Contractor shall submit the number of Samples required in the Specifications.
    - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.
  3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
  2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
  3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
  4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
  5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
  6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
  7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.



8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal;
  6. the issuance of a notice of acceptability by Engineer;
  7. any inspection, test, or approval by others; or
  8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

#### 7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

## **ARTICLE 8 – OTHER WORK AT THE SITE**

### **8.01 *Other Work***

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

## 8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
  - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
  - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
  - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

## 8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

## **ARTICLE 9 – OWNER'S RESPONSIBILITIES**

### **9.01 *Communications to Contractor***

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

### **9.02 *Replacement of Engineer***

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

### **9.03 *Furnish Data***

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

### **9.04 *Pay When Due***

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

### **9.05 *Lands and Easements; Reports, Tests, and Drawings***

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

### **9.06 *Insurance***

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

### **9.07 *Change Orders***

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

**ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION**

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

#### 10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

### **ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

#### 11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
  - 1. *Change Orders:*
    - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
    - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
  - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an



adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

#### 11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

#### 11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

#### 11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

#### 11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

#### 11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
  2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
  3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

#### 11.07 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
  2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
  3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
  4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

#### 11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

### **ARTICLE 12 – CLAIMS**

#### 12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
  - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
  - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
  - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
  - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
  - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

## **ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### 13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
  1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
  2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
  1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
  - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
  - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

### 13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
  - 2. there is no corresponding adjustment with respect to any other item of Work; and
  - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.



## **ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### **14.01 Access to Work**

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

### **14.02 Tests, Inspections, and Approvals**

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
  - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
  - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
  - 3. by manufacturers of equipment furnished under the Contract Documents;
  - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
  - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

#### 14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

#### 14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

#### 14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
  - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

#### 14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

## **ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD**

### **15.01 Progress Payments**

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
  2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
  3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
  2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
    - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
    - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
  4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
    - a. to supervise, direct, or control the Work, or
    - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
    - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
    - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
    - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
  5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
  6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
    - a. the Work is defective, requiring correction or replacement;
    - b. the Contract Price has been reduced by Change Orders;
    - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
    - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
  - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
  - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
  - c. Contractor has failed to provide and maintain required bonds or insurance;
  - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
  - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
  - f. the Work is defective, requiring correction or replacement;
  - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
  - h. the Contract Price has been reduced by Change Orders;
  - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
  - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
  - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

#### 15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

#### 15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

#### 15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
  - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
  - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
  - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

#### 15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 15.06 *Final Payment*

- A. *Application for Payment:*
  - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of



inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents;
  - b. consent of the surety, if any, to final payment;
  - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
  - d. a list of all disputes that Contractor believes are unsettled; and
  - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

**B. *Engineer's Review of Application and Acceptance:***

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

**C. *Completion of Work:*** The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

**D. *Payment Becomes Due:*** Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

#### 15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

#### 15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. correct the defective repairs to the Site or such other adjacent areas;
  - 2. correct such defective Work;
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

## **ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION**

### **16.01 *Owner May Suspend Work***

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

### **16.02 *Owner May Terminate for Cause***

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
  - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
  - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
  - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
  - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
  - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
  - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

#### 16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
  - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
  - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

#### 16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

## **ARTICLE 17 – FINAL RESOLUTION OF DISPUTES**

### **17.01 *Methods and Procedures***

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
  - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
  - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
  - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agree with the other party to submit the dispute to another dispute resolution process; or
  - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

## **ARTICLE 18 – MISCELLANEOUS**

### **18.01 *Giving Notice***

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
  - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

### **18.02 *Computation of Times***

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### **18.03 *Cumulative Remedies***

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**DIVISION 0 - SECTION 00800**  
**SUPPLEMENTARY CONDITIONS**  
**ITB 18-011**

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2013 Edition) and other provisions of the Contract Documents as indicated below. All references in these Supplementary Conditions to the Standard General Conditions are to the Standard General Conditions of the Construction Contract, EJCDC C-700 (2013 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings stated in those Standard General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the Standard General Conditions of the Construction Contract EJCDC C-700 (2013 Edition), with the prefix "SC" added thereto.

SC-1.01 *Defined Terms*

Delete the definition of the term Liens in Paragraph 1.01.A.24. and insert in its place the following:

24. *Liens* – Charges, security, interests, or encumbrances upon Contract – related funds, real property, or personal property and claims delivered to Owner by laborers, Subcontractors, and Suppliers who have not been paid by Contractor.

SC-2.01 *Delivery of Bonds and Evidence of Insurance*

Delete Paragraph 2.01.A. in its entirety and insert the following in its place:

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner unexecuted copies of the bonds and related powers of attorney that Contractor will be required to furnish. Within 10 days after execution of the Agreement by Owner, Contractor shall deliver to Owner fully executed bonds, accompanied by a certified copy of the signing individual's authority to bind the surety establishing that it is effective on the date the agent or attorney-in-fact signed the accompanying bond, as provided in Paragraph 5.06.B. of the Standard General Conditions.

SC-2.02 *Copies of Documents*

Delete Paragraph 2.02.A. in its entirety and insert the following in its place:

- A. Owner shall furnish Contractor with 1 printed copy of the fully executed Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

SC-2.04 *Preconstruction Conference; Designation of Authorized Representatives*

Add the following to the end of Paragraph 2.04.A.:

Contractor shall be ready, willing, and able to attend this conference within 10 calendar days after the date of the notice to proceed. The date, time, and place of this conference will be set by Engineer.

SC-4.01 *Commencement of Contract Times; Notice to Proceed*

Delete Paragraph 4.01.A. in its entirety and insert the following in its place:

- A. The Contract Times will commence to run on the day indicated in a Notice to Proceed.

SC-4.02 *Starting the Work*

Add the following new Paragraph to Paragraph 4.02:

- B. Contractor, before beginning the Work or within 2 workdays thereafter, shall post in a conspicuous place on the Site the following notice.

Notice is hereby made to all those concerned and affected that \_\_\_\_\_  
\_\_\_\_\_ is performing the "Construction of the Istokpoga Marsh Water Improvement, Project No. 14041." All parties furnishing labor and/or materials to that project must, within twenty (20) days of first providing such labor and/or materials, deliver notice of such in writing, by certified mail, return receipt requested, to:

HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS  
Road and Bridge Department  
ATTN: Kyle Green, Director  
4344 George Blvd., Sebring, FL 33875

SC-5.01 *Availability of Lands*

Delete the following from Paragraph 5.01.B.:

as necessary for giving notice of or filing a mechanic's or construction Lien against such lands in accordance with applicable Laws and Regulations



#### SC-5.02 *Use of Sites and Other Areas*

Add the following new paragraph to Paragraph 5.02:

- E. Contractor shall at all times control dust and keep the Sites free from accumulation of waste materials or rubbish caused by Contractor's employees or subcontractors, and at the completion of the Work, Contractor shall remove all Contractor's rubbish from and about the Sites and all Contractor's tools and surplus materials and shall leave Contractor's Sites and any other Work area clean. Owner may remove the rubbish and charge the cost to Contractor as the Engineer may determine to be just. In the event that Contractor does not keep the Sites and any other Work area free of rubbish or accumulations of waste materials and control dust, Owner will withhold an additional 5% from any pay request, above and beyond the standard 10% retainage.

#### SC-5.03 *Subsurface and Physical Conditions*

Add the following new paragraphs immediately after Paragraph 5.03.B:

- C. *Subsurface Conditions Known to Owner:* The subsurface conditions at or contiguous to the Site known to Owner are shown on the Drawings and Specifications that are Exhibit "A" of the Contract Documents. Contractor is not entitled to rely upon any other information and data known to or identified by Owner or Project Manager.
- D. *Unforeseen Physical Conditions:* Contractor shall notify Engineer in writing of any subsurface or latent physical condition at the Site differing materially from those indicated in the Contract Documents. Engineer shall promptly investigate those conditions and advise Owner in writing if additional information shall be required. Owner shall then obtain such information, and if deemed necessary, shall issue written orders to perform necessary revisions.

#### SC 5.05 *Underground Facilities*

Add the following new Paragraph to Paragraph 5.05:

- F. *Protection of Underground Facilities.*
  - 1. Existing utilities and other facilities such as drainage structures have been indicated on the Drawings and Specifications only to the extent that such information was made available to Owner. There is no guarantee as to the accuracy or completeness of this information, and Owner will not be responsible for such accuracy or completeness.
  - 2. Contractor shall be responsible for protecting all such utilities indicated in the manner determined necessary by the owner of such utilities. Any utilities not indicated on the

Drawings and Specifications, which do not require relocation, shall be protected by Contractor. The Work shall be performed at the original Contract Price. All visible surface facilities or underground utilities shown on the Drawings and Specifications, whether or not shown to be relocated, shall be protected or relocated by Contractor at its expense.

3. Utility relocations are not anticipated for this Project. However, existing utilities which are found during construction and determined necessary to be relocated will be considered an unknown condition. Contractor will cooperate with the appropriate authority in identifying and protecting the utility during relocation.
4. Abandoned utilities, when encountered, shall be severed and plugged at Contractor's expense.
5. Contractor shall be responsible for discovery of existing underground installations, in advance of excavating or trenching, by contacting all local utilities and by prospecting and pot holing. Any damage to facilities not shown shall be solely the responsibility of Contractor.

SC-5.06 *Hazardous Environmental Conditions at Site*

Delete Paragraphs 5.06.A. and 5.06B. in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. Not Used.

Delete Paragraph 5.06.I. in its entirety.

SC-6.01 *Performance, Payment, and Other Bonds*

Delete Paragraph 6.01.A. in its entirety and insert the following in its place:

- A. Contractor shall furnish a payment and performance bond in an amount at least equal to the Contract Price, in complete satisfaction of the provisions of Section 255.05, Florida Statutes, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. The form of the payment and performance bond shall be in the form of the Public Construction Bond provided by Owner in Section 00600 of the ITB issued by Owner for construction of the Work. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by applicable Laws and Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the

Supplementary Conditions or other specific provisions of the Contract. Contractor shall record that bond in the Public Records of Highlands County, Florida, as required by Section 255.05(1), Florida Statutes.

SC-6.03 *Contractor's Insurance*

Delete Paragraph 6.03.1.3. in its entirety and insert the following in its place:

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 10 days, or such longer time period as is required by Laws and Regulations, prior written notice has been given to Contractor.

Add the following new Paragraphs to Paragraph 6.03:

- K. Contractor shall have and maintain in full force and effect the following insurance during the Term of this Contract and shall furnish to County Certificates of Insurance documenting that insurance coverage has been obtained which meets the following requirements:
  1. Workers' Compensation. Contractor shall have and maintain workers' compensation insurance for all employees for statutory limits in compliance with applicable Laws and Regulations. This insurance policy must include Employer's Liability with a limit of \$100,000 each accident, \$500,000 disease (policy Limit), and \$100,000 disease (each employee).
  2. Commercial General Liability. Occurrence Form Required: Contractor shall have and maintain commercial general liability (CGL) insurance with a limit of not less than \$3,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project in the amount of \$3,000,000. Products and completed operations aggregate shall be \$3,000,000. CGL insurance shall be written on an occurrence form and shall include bodily injury and property damage liability for premises, operations, independent contractors, products and completed operations, contractual liability, broad form property damage and property damage resulting from explosion, collapse or underground (x, c, u) exposures, personal injury, and advertising injury. Fire damage liability shall be included at \$100,000.
  3. Commercial Auto Liability Insurance. Contractor shall have and maintain commercial automobile liability insurance with a limit of not less than \$3,000,000 combined single limit per occurrence for bodily injury and property damage liability. That insurance shall cover liability arising out of any auto (including owned, hired, and non-owned autos). The policy shall be endorsed to provide contractual liability coverage.

4. Umbrella Excess Liability - Contractor may satisfy the required minimum liability limits with an Umbrella or Excess Liability policy. Contractor agrees to endorse Owner and its elected officials, agents, employees, and volunteers, in the manner required by Paragraph 6.03.K.7, as Additional Insureds unless the Umbrella provides "follow form" provisions of the underlying policies. This must be confirmed in writing on the Certificate of Insurance.
  5. Deductibles/Retentions - Contractor is responsible for any expenses or costs below deductibles applicable to any policies.
  6. Formal Certificates of Insurance shall be delivered by Contractor to Owner upon execution of the Agreement. Certificates of Insurance shall be signed by a person authorized by that insurer to bind coverage on its behalf. All Certificates of Insurance must be on file with and approved by Owner before commencement of any Work activities.
  7. The formal insurance certificates shall name "Highlands County, a political subdivision of the State of Florida and its elected officials, agents, employees and volunteers" as "Additional Insureds" on all policies except Workers' Compensation. Additional Insureds status for Completed Operations must be provided without time limitation or for a minimum of 5 years following completion of the Project.
  8. These are minimum requirements which are subject to modification in response to high hazard operations. Owner reserves the right to require Contractor to provide and pay for any other insurance coverage Owner deems necessary, depending upon the possible exposure to liability.
  9. The policies of insurance shall be written on forms acceptable to Owner and placed with insurance carriers authorized by the Insurance Department in the State of Florida and meet a minimum financial AM Best company rating of no less than "A- Excellent: FSC VII.
  10. All policies must include Waiver of Subrogation and any liability aggregate limits shall apply "Per Jobsite"/Per Job Aggregate. All liability insurance shall be Primary and Non-Contributory. Each Certificate of Insurance shall confirm in writing that these provisions apply.
- L. Contractor shall require each Subcontractor to have and maintain the insurance required by Paragraph 6.03.K. This requirement may be modified by Owner by written instrument on a case by case basis, in its sole discretion. It is the responsibility of the Contractor to ensure that all Subcontractors comply with all insurance requirements.

- M. Contractor shall provide notification to Owner and Engineer by overnight delivery return receipt requested, hand delivery or confirmed facsimile 30 days prior to giving and within 3 days after receiving notice of cancellation, modification, non-renewal, or any other lapse in coverage of any required insurance policies.

SC-6.05 *Property Insurance*

Delete Paragraph 6.05.B. in its entirety and insert the following Paragraph in its place:

- B *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days, or such longer time period as is required by Laws and Regulations, prior written notice has been given to the purchasing policyholder. Contractor shall provide notification to Owner and Engineer by overnight delivery return receipt requested, hand delivery or confirmed facsimile 30 days prior to giving and within 3 days after receiving notice of cancellation, modification, non-renewal, or any other lapse in coverage of any required insurance policies.

SC-6.06 *Waiver of Rights*

Delete Paragraphs 6.06.B. and C. in their entirety.

SC-7.01 *Supervision and Superintendence*

Add the following to the end of Paragraph 7.01.B.:

The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

SC-7.02 *Labor; Working Hours*

Add the following new Paragraphs immediately after Paragraph 7.02.B.:

- C. In all cases, local labor shall be given preference when available.
- D. Whenever Owner shall notify Contractor that any man on the Work is, in his opinion, incompetent, unfaithful, or disorderly, or who uses threatening or abusive language to any person representing Owner when on the Work, such man shall be immediately discharged from the Work and shall not be re-employed thereon except with the consent of Owner.

SC-7.03 *Services, Materials, and Equipment*

Add the following new Paragraph immediately after Paragraph 7.03.C.:

D. The responsibility for the protection and safekeeping of equipment and materials on or near the Site will be entirely that of Contractor and that no Claim shall be made against Owner by reason of any act of an employee or trespasser. Should an occasion arise necessitating access to the sites occupied by the stored materials and equipment, Contractor shall immediately move same. No materials or equipment may be placed upon the property of Owner until Owner has approved the location contemplated by Contractor to be used for storage.

SC-7.04 *“Or Equals”*

Delete the word “considered” from Paragraph 7.04.E. and insert the word “consider” in its place.

SC-7.06 *Concerning Subcontractors, Suppliers, and Others*

Delete Paragraph 7.06.H. in its entirety and insert the following in its place:

H. Prior to submitting the first Application for Payment and within 3 workdays after any change, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

SC-7.07 *Patent Fees and Royalties*

Delete Paragraph 7.07.B. in its entirety.

SC-7.08 *Permits*

Delete Paragraph 7.08.A. in its entirety and insert the following in its place:

A. Unless otherwise provided in the Contract Documents or Section 218.80, Florida Statutes, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor’s Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

SC-7.09 *Taxes and Direct Material Purchase Procedure*

Add the following new Paragraphs immediately after Paragraph 7.09.A.:

- B. Owner is exempt from payment of sales and compensating use taxes of the State of Florida and of cities and counties thereof on all materials to be incorporated into the Work.
- C. Contractor shall provide assistance to Owner for Direct Purchases to enable Owner to purchase tangible personal property needed for this Project which Owner intends to purchase in order to realize savings of sales tax on all tangible personal property needed for this Project. Contractor will recommend direct purchases for items where those direct purchases will result in significant tax savings to Owner. Owner will either accept or reject Contractor's recommendations, and purchases will be made according to Owner's decision. Owner retains the absolute right, with or without Contractor's recommendation, to purchase any or all tangible personal property needed for this Project.
- D. Contractor will provide detailed scoping and pricing for purchase orders with a minimum value of Five Thousand Dollars (\$5,000.00), in harmony with the Subcontractors to Owner for the incorporation in Owner's purchase orders.
- E. Owner will issue purchase orders within three (3) workdays from the date of receipt of requisition, directly to the vendors and provide a copy of each purchase order to Contractor.
- F. Contractor will be responsible for the materials until they are incorporated into the Project and will purchase and/or have ample Builder's Risk insurance for the direct purchased materials.
- G. Contractor will issue a deductive subcontract adjustment to the Subcontractor which will account for the value of the material and the sales tax as it pertains to that Subcontractor's contract. All subcontracts shall include a clause incorporating, by reference, the provisions of this Paragraph 7.09.
- H. As the material is delivered to the Site, the Subcontractor will sign off on the delivery receipt/invoice for the material delivered, store and secure the material adequately at the Site, and forward the invoice to Contractor who will review, approve and forward the invoice to Owner's Representative for approval and processing.
- I. Owner will draft a check for the approved invoice amount and mail that check directly to the vendor. A list of the check numbers with related dates of issue, names of vendors, amounts paid, and paid invoice numbers will be forwarded to Contractor in order that Contractor can accurately track payment.
- J. Contractor and Owner are encouraged to take advantage of all discounts available.
- K. Owner will issue to Contractor a deductive Change Order in the amount of the direct purchased materials. The amount equal to the sales tax which would have been paid

if those materials had been purchased by Contractor will be credited to Owner through a Contingency line item on the pay application's schedule of values, and the Contract Price specified in Article 4 of the Agreement shall be reduced by an amount equal to the amounts paid directly by Owner for direct purchases made pursuant to this Article, plus an amount equal to the sales tax that would have been paid if those materials had been purchased by Contractor.

SC-7.10 *Laws and Regulations*

Delete Paragraph 7.10.B. in its entirety and insert the following in its place:

- B. It shall be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations. Contractor shall bear all costs and losses, and shall indemnify and hold harmless Owner and Owner's officers and employees from and against all liabilities, damages, losses, and costs, including, but not limited to, reasonable attorney's fees arising out of or relating to Work or other action that is contrary to Laws or Regulations.

SC-7.11 *Record Documents*

Delete the word "Engineer" at the end of Paragraph 7.11.A. and insert the word "Owner" in its place.

SC-7.12 *Safety and Protection*

Add the following new Paragraph to Paragraph 7.12:

- H. Contractor shall pay for all damages to private property, public property, and any public utilities.

SC-7.17 *Contractor's General Warranty and Guarantee*

Add the following new Paragraph to paragraph 7.17:

- E. All materials incorporated in the Work shall comply with the requirements of the Construction Documents. Any Defective Work which develop within 1 year after the date of final acceptance shall be promptly repaired by or replaced to "as new" condition by Contractor without any additional expense to Owner.

SC-7.18 *Indemnification*

Delete Paragraph 7.18 in its entirety and insert the following in its place.

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Owner's officers and employees from and against all



liabilities, damages, losses, and costs, including, but not limited to, reasonable attorney's fees to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of Contractor and persons employed or utilized by Contractor in the performance of any of the Work.

- B. In any and all claims against Owner or any of its officers or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly utilized by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall be limited to \$1,000,000 per occurrence.

#### SC-7.19 *Delegation of Professional Design Services*

Add the following new Paragraph immediately after Paragraph 7.19.E.:

- F. If Contractor provides professional design services as a design professional, as that term is defined in Section 725.08(4), Florida Statutes, Contractor shall indemnify and hold harmless Owner and Owner's officers and employees, from liabilities, damages, losses, and costs, including, but not limited to reasonable attorneys' fees, to the extent caused by the negligence, recklessness, or intentionally wrongful conduct of Contractor providing professional design services as a design professional and other persons employed or utilized by Contractor in the performance of the professional design services.

#### SC-7.20-7.29

Add the following new Paragraphs immediately after new Paragraph 7.19.F.:

#### SC-7.20 *Storage of Materials*

- A. The responsibility for the protection and safekeeping of equipment and materials on or near the Site will be entirely that of Contractor, and no claim shall be made against Owner by reason of any act of an employee or trespasser. Should an occasion arise necessitating access to the sites occupied by these stored materials and equipment, Contractor shall immediately move same. No materials or equipment may be placed upon the property of Owner until Owner has approved the location contemplated by Contractor to be used for storage.

SC-7.21 *Erosion and Drainage Control*

- A. Contractor shall implement Best Management Practices (BMP's) to provide for drainage of storm water and such water as may be applied or discharged on the Site in performance of the Work. Drainage facilities shall be adequate to prevent damage to the Work, the Site and adjacent property.
- B. Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris or other substances resulting from this work. Contractor shall clean up and isolate such materials on a continuing basis to prevent risk of washing into such drainage ways.
- C. Contractor shall determine if a Stormwater Discharge Permit or a Construction Dewatering Discharge Permit applies to the Work. Contractor shall obtain required permit(s) if necessary for completion of the Work.

SC-7.22 *Protection of Trees and Natural Conditions*

- A. No trees or shrubs shall be damaged or removed beyond delineated limits of disturbance except those flagged by Owner. No areas shall be disturbed beyond the designated limits indicated by Owner. Contractor shall install orange safety fence to delineate limits of disturbance, and Contractor shall be responsible for damage mitigation beyond these limits.

SC-7.23 *Dewatering*

- A. If dewatering is required at the Site, Contractor shall comply with all dewatering requirements of governmental agencies.

SC-7.24 *Protection of Public and Private Property*

- A. Contractor shall protect, shore, brace, support and maintain all underground pipes, conduits, drains, and other underground or above ground structures uncovered or otherwise affected by the construction of the Work performed by Contractor. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences, guard posts, and other surface structures affected by construction operations, together with all trees, sod and shrubs in yards and parking lots removed or damaged, shall be restored to their original condition or replaced as determined and approved by Owner, whether within or outside Owner's right-of-way. All replacements shall be made with new materials.
- B. Contractor shall be responsible for all damages to streets, roads, highways, shoulders, ditches, embankments, culverts, facilities and utilities, bridges, property corners and monuments and other public or private property, regardless of location or character, which may be caused by construction of the Work or by transporting equipment, materials or men

to or from the Work or any part or site thereof, whether by Contractor or Contractor's Subcontractors. Contractor shall make satisfactory and acceptable arrangements with the owner of, or the agency or authority having jurisdiction over, the damaged property concerning its repair or replacement or payment of costs incurred in connection with the damage.

- C. All fire hydrants and water control valves shall be kept free from obstruction and for use at all times.
- D. Contractor shall be responsible for any damage to existing structures during the course of the Work.

SC-7.25 *Maintenance of Traffic*

- A. Contractor shall provide traffic control plans as required by the controlling highway, street or road authority. Contractor shall perform the Work so as to interfere as little as possible with public travel, whether vehicular or pedestrian. Whenever necessary to cross, use, obstruct or close roads, driveways and walks, whether public or private, Contractor shall, at its own expense, provide and maintain suitable and safe bridges, detours or other temporary expedients, for the accommodation of public and private travel, and shall give reasonable notice to owners of private drives before interfering with them. Such maintenance of traffic will not be required when Contractor has obtained permission from the owner and tenant of private property, or from the authority having jurisdiction over the public property involved, to obstruct traffic at the designated point. Obstructions, such as material piles and equipment, shall be provided with appropriate warning signs and lights.
- B. After completion, the roadway shall be restored to original condition, and disturbed areas shall be restored to original condition.

SC-7.26 *Testing*

- A. Contractor shall be responsible for all testing required for sampling and testing of materials to prove compliance with the Contract Documents. This shall include, but not be limited to mix design approvals for concrete and asphalt, pipe bedding gradations and Proctor tests and gradations for imported granular fill materials. Specific requirements shall be included in the applicable specification sections.
- B. Tests required to monitor control performance of the Work in accordance with the Contract Documents such as concrete cylinder tests and compaction tests shall be ordered and paid for by Contractor. Any retesting required as a result of the first test failure will be at Contractor's expense. Contractor will assist in providing locations and allowing the tests to be conducted without obstructions and in accordance with all Laws and Regulations. Contractor shall correct or modify its operations where indicated necessary by the test

results.

SC-7.27 *Unfavorable Construction Conditions*

- A. During unfavorable weather, wet ground or other unsuitable construction conditions, Contractor shall confine its operations to work which will not be affected adversely by such conditions. No portion of the Work shall be constructed under conditions which affect adversely the quality or efficiency thereof, unless special means or precautions are taken by Contractor to perform the Work in a proper and satisfactory manner.

SC-7.28 *Notices to Owners and Authorities*

- A. Contractor shall notify owners of adjacent property and utilities when prosecution of Work may affect them.
- B. Utilities and other concerned agencies shall be contracted at least 48 hours prior to cutting or closing streets or other traffic areas or excavating near Underground Facilities or pole lines.

SC-7.29 *Storage of Fuel or Hazardous Materials*

- A. No fuel or other hazardous materials shall be stored on the Site. Extreme care and compliance with all regulations shall be required when handling all such materials.

SC-11.01 *Amending and Supplementing Contract Documents*

Delete the first sentence of Paragraph 11.01.A. and insert the following in its place:

The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order if approved, in writing, by Owner.

SC-14.02 *Tests, Inspections, and Approvals*

Delete Paragraph 14.02.B. in its entirety and insert the following in its place:

- B. Owner shall retain and Contractor shall pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

**SC-15 ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD.**

Add the following to the end of 15.01.B.1.:

If the payment and performance of the Work is not secured by a payment and performance bond, all applications for payment shall include a written statement that indicates how the payment will be distributed. Contractor shall disburse the payment as provided in that written statement.

Add the following new Paragraph to Paragraph 15.01.B.:

4. *If Requested by Owner:*

- a. Contractor shall deliver a certified list of all Subcontractors, laborers, and material suppliers to Owner within 30 days of receiving the request. This list shall be updated by Contractor thereafter each month with a certified statement by Contractor that the list and its updates include the names and address of all of Subcontractors, laborers, and Suppliers furnishing labor and/or material for the Project.
- b. Contractor shall provide a written statement with each pay request to the Owner which indicates how each payment will be distributed. This pay request breakdown shall define the disbursement of all the funds requested.
- c. When Contractor receives any payment pursuant to this Contract, Contractor shall pay laborers and each Subcontractor and Supplier the amounts stated in Contractor's written statement delivered to Owner for that pay request.
- d. Contractor shall provide a written statement with all but the first payment request from each of the Subcontractors, laborers, and Suppliers identified in Paragraph 15.01.B.4.b., that they have in fact received payment as provided in Paragraph 15.01.B.4.c. In the event a payment will not be made as stated on a prior written statement delivered pursuant to Paragraph 15.01.B.4.b., Contractor shall furnish an explanation as to the reasons for such deviation and shall request approval from the Engineer.

Add the following new Paragraphs immediately after Paragraph 15.08.E.:

**SC-15.09 *Local Government Prompt Payment Act***

- A. If the total cost of the construction services purchased by Owner pursuant to this Contract exceeds \$200,000, the provisions of this Article are subject to the provisions of the Local Government Prompt Payment Act, Sections 218.70 through 218.79, inclusive, Florida Statutes, except to the extent provided therein and in that event provisions of this Article are modified and amended to the extent required to be consistent with the Local Government Prompt Payment Act.

SC-15.10 *Interest*

A. All moneys not paid when due as provided in Paragraph 15 shall bear interest at the maximum rate of 6 percent per annum, simple.

SC-16.02 *Owner May Terminate for Cause*

Delete Paragraph 16.02 in its entirety and insert the following in its place:

16.02 *Owner May Terminate for Cause or Convenience*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
4. Contractor's repeated disregard of the authority of Owner or Engineer; or
5. Contractor becomes involved as a debtor in a bankruptcy proceeding, or becomes involved in a reorganization, dissolution, or liquidation proceeding, or if a trustee or receiver is appointed over all or a substantial portion of the property of Contractor under federal bankruptcy law or any state insolvency law.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten (10) days written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, give Contractor (and any surety) notice that the Contract is terminated, and enforce the rights available to Owner under any applicable payment and performance bond; or
2. notify Contractor of the deficiency with a requirement that the deficiency be corrected within a specified time, otherwise the Contract will be terminated at the end of such time; or
3. take whatever action is deemed appropriate by Owner.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work,

incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

- D. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraph 16.02.B.



## SECTION 00820 Contract Provisions

The Department, as a recipient or pass-through entity shall require all subrecipients, including lower tier subrecipients, under the award to comply with the provisions of the award, including applicable provisions of the OMB Uniform Guidance (2 CFR Part 200), and all associated terms and conditions. All contracts/agreements awarded by a recipient, including small purchases, shall contain the following provisions as applicable:

### **NONDISCRIMINATION**

1. **Equal Employment Opportunity** – All contracts shall contain a provision requiring compliance with Presidential Executive Order (E.O.) 11246, "Equal Employment Opportunity," as amended by Presidential E.O. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and as supplemented by regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."
2. **Compliance with all Federal statutes relating to nondiscrimination** – These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352), which prohibits discrimination on the basis of sex, race, color, and national origin, Presidential E.O. 12898 "*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*" and Presidential E.O. 13166 "*Improving Access to Services for Person with Limited English Proficiency (LEP)*"; (b) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 795), which prohibits discrimination against persons with disabilities; (c) the Age Discrimination Act of 1975, as amended (42 U.S.C. 6101-6107), which prohibits discrimination on the basis of age; (d) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (e) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (f) Sections 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (g) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. 3601 *et seq.*), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (h) if an education program is conducted under this agreement, Title IX of the Education Amendments of 1972, which prohibits discrimination on the basis of sex in education programs and activities; (i) if this agreement is funded under the Clean Water Act, Section 13 of the Federal Water Pollution Control Act Amendments of 1972, prohibits discrimination on the basis of sex in CWA-funded programs or activities; (j) any other nondiscrimination provisions in the specific statute(s) made; and, (k) the requirements of any other nondiscrimination statute(s) that may apply;
3. **Compliance with Title VI of the Civil Rights Act** – (i) Recipients of EPA financial assistance are required to provide meaningful access to Limited English Proficiency (LEP) individuals. To meet this requirements, recipients agree to use as a guide the Office of Civil Rights (OCR) document entitled "Guidance to Environmental Protection Agency Financial Assistance Recipients Regarding Title VI Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons." Available online here: [http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2004\\_register&docid=fr25jn04-79.pdf](http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2004_register&docid=fr25jn04-79.pdf) (ii) If the recipient is administering permitting programs under this agreement, the recipient agrees to use as a guide OCR's Title VI Public Involvement Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs, available here: <http://edocket.access.gpo.gov/2006/pdf/062691.pdf> (iii) In accepting this assistance agreement, the recipient acknowledges it has an affirmative obligation to implement effective Title VI compliance programs and ensure that its actions do not involve discriminatory treatment and do not have discriminatory effects even when facially neutral. The recipient must be prepared to demonstrate to EPA that such compliance programs exist and are being implemented or to otherwise demonstrate how it is meeting its Title VI obligations.
4. **Electronic and Information Technology Accessibility** – Recipients are subject to the program accessibility provisions of Section 504 of the Rehabilitation Act, codified in 29 U.S.C. 701, and Section 508 of the Rehabilitation Act, codified in 29 U.S.C. 794, as amended, which includes an obligation to provide individuals with disabilities reasonable accommodations and an equal and effective opportunity to benefit from or participate in a program, including those offered through electronic and information technology



("EIT"). In compliance with Sections 504 and 508, EIT systems or products funded by this award must be designed to meet the diverse needs of users (e.g., U.S. public, recipient personnel) without barriers or diminished function or quality. Systems shall include usability features or functions that accommodate the needs of persons with disabilities, including those who use assistive technology. At this time, the EPA will consider a recipient's websites, interactive tools, and other EIT as being in compliance with Section 504 if such technologies meet standards established under 36 CFR Part 1194, "Electronic Information Technology Accessibility Standards", which implements Section 508.

5. **Compliance with the EPA's Environmental Justice Guidance under the National Environmental Policy Act (42 U.S.C. 4321)** – Related to the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies.

#### **ADMINISTRATIVE**

6. **Operation and Maintenance** (Projects funded by EPA §319(h) funds) – Grantees will assure the continued proper operation and maintenance of all nonpoint source management practices that have been implemented for Projects funded under this Agreement. Such practices shall be operated and maintained for the expected lifespan of the specific practice and in accordance with commonly accepted standards. Likewise, the Grantee will assure that similar provisions are included in any sub-agreements that are awarded.

7. **Copeland "Anti-Kickback" Act (18 U.S.C. 874 and 40 U.S.C. 276c)** – All contracts and subgrants in excess of \$2,000 for construction or repair awarded by recipients and subrecipients shall include a provision for compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. 874), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or subrecipient shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he is otherwise entitled. The recipient shall report all suspected or reported violations to the Federal awarding agency.

8. **Davis-Bacon Act, as amended (40 U.S.C. 276a to a-7)** – When required by Federal program legislation, all construction contracts awarded by the recipients and subrecipients of more than \$2,000 shall include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 276a to a-7) and as supplemented by Department of Labor regulations (29 CFR part 5, "Labor Standards Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction"). Under this Act, contractors shall be required to pay wages to laborers and mechanics at a rate not less than the minimum wages specified in a wage determination made by the Secretary of Labor. In addition, contractors shall be required to pay wages not less than once a week. The recipient shall place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation and the award of a contract shall be conditioned upon the acceptance of the wage determination. The recipient shall report all suspected or reported violations to the Federal awarding agency. For projects funded by EPA §319(h) funds, the Davis-Bacon Act requires that wages for laborers and mechanics working on specific, federally funded projects be set at the current wage rate for that region. Specifically, the act requires that each contract over \$2,000 for the construction, alteration, or repair of public buildings or public works follow the minimum wages to be paid to various classes of laborers and mechanics employed under the contract.

9. **Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333)** – Where applicable, all contracts awarded by recipients in excess of \$2,000 for construction contracts and in excess of \$2,500 for other contracts that involve the employment of mechanics or laborers shall include a provision for compliance with Sections 102 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333), as supplemented by Department of Labor regulations (29 CFR Part 5). Under Section 102 of the Act, each contractor shall be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than 1 ½ times the basic rate of pay for all hours worked in excess of 40 hours in the work week. Section 107 of the Act is applicable to construction work and provides that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary,

hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

10. **Rights to Patents and Inventions Made Under a Contract or Agreement** – Rights to inventions made under this assistance agreement are subject to federal patent and licensing regulations, which are codified at Title 37 CFR Part 401 and Title 35 U.S.C. 200 through 212.

Pursuant to the Bayh-Dole Act (set forth in 35 U.S.C. 200 through 212), EPA retains the right to a worldwide, nonexclusive, nontransferable, irrevocable, paid-up license to practice the invention owned by the assistance agreement holder, as defined in the Act. To streamline the invention reporting process and to facilitate compliance with the Bayh-Dole Act, the recipient must utilize the Interagency Edison extramural invention reporting system at <http://iEdison.gov>. Annual utilization reports must be submitted through the system. The recipient is required to notify the Project Officer identified on the award document when an invention report, patent report, or utilization report is filed at <http://iEdison.gov>. EPA elects not to require the recipient to provide a report prior to the close-out of a funding agreement listing all subject inventions or stating that there were none.

In accordance with Presidential Executive Order 12591, as amended, government owned and operated laboratories can enter into cooperative research and development agreements with other federal laboratories, state and local governments, universities, and the private sector, and license, assign, or waive rights to intellectual property “developed by the laboratory either under such cooperative research or development agreements and from within individual laboratories.”

11. **Copyrighted Material and Data** – In accordance with 2 CFR §200.315, EPA has the right to reproduce, publish, use and authorize others to reproduce, publish and use copyrighted works or other data developed under this assistance agreement for Federal purposes.

Examples of a Federal purpose include but are not limited to: (1) Use by EPA and other Federal employees for official Government purposes; (2) Use by Federal contractors performing specific tasks for the Government; (3) Publication in EPA documents provided the document does not disclose trade secrets (e.g. software codes) and the work is properly attributed to the recipient through citation or otherwise; (4) Reproduction of documents for inclusion in Federal depositories; (5) Use by State, tribal and local governments that carry out delegated Federal environmental programs as “co-regulators” or act as official partners with EPA to carry out a national environmental program within their jurisdiction; and, (6) Limited use by other grantees to carry out Federal grants provided the use is consistent with the terms of EPA’s authorization to the other grantee to use the copyrighted works or other data.

Under Item 6, the grantee acknowledges that EPA may authorize another grantee(s) to use the copyrighted works or other data developed under this grant as a result of:

- The selection of another grantee by EPA to perform a project that will involve the use of copyrighted work or other data or;
- Termination or expiration of this agreement.

In addition, EPA may authorize another grantee to use copyrighted works or other data developed with Agency funds under this grant to perform another grant when such use promotes effective use of Federal grant funds.

12. **Clean Air Act (42 U.S.C. 7401 et seq.), Clean Water Act (33 U.S.C. 1368), Presidential E.O. 11738, the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.) and Environmental Protection Agency Standards** – Contracts and subgrants of amounts in excess of \$150,000 shall contain a provision that requires the recipient to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401 et seq.), Clean Water Act (33 U.S.C. 1368), Presidential E.O. 11738, the Federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq.), and Environmental Protection Agency regulations (40 CFR Part 15). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

13. **Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)** – Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting

to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient.

14. **Debarment and Suspension (Presidential E.O.s 12549, 12689 and 2 CFR Part 180 and Part 1500)** – No contract shall be made to parties listed on the General Services Administration's List of Parties Excluded from Federal Procurement or Nonprocurement Programs in accordance with Presidential E.O.s 12549 and 12689, "Debarment and Suspension." This list contains the names of parties debarred, suspended, or otherwise excluded by agencies, and contractors declared ineligible under statutory or regulatory authority other than Presidential E.O. 12549. Contractors with awards that exceed the small purchase threshold shall provide the required certification regarding its exclusion status and that of its principal employees.

15. **Section 508 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1368) and Section 1424(e) of the Safe Drinking Water Act (42 U.S.C. 300h-3(e))** – Contracts and subgrants of amounts in excess of \$100,000 shall contain a provision that requires the recipient to agree to comply with all applicable standards, orders or regulations issued pursuant to Section 508 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1368) and Section 1424(e) of the Safe Drinking Water Act (42 U.S.C. 300h-3(e)). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

16. **Tangible Personal Property** – Pursuant to 2 CFR §200.312 and §200.314, property reports, if applicable, are required for Federally-owned property in the custody of a non-Federal entity upon completion of the Federal award or when the property is no longer needed. Additionally, upon termination or completion of the project, residual unused supplies with a total aggregate fair market value exceeding \$5,000 not needed for any other Federally-sponsored programs or projects must be reported. For Superfund awards under Subpart O, refer to 40 CFR §35.6340 and §35.6660 for property reporting requirements. Recipients should utilize the Tangible Personal Property Report form series (SF-428) to report tangible personal property.

17. **Hotel-Motel Fire Safety** – Pursuant to 15 U.S.C. 2225a, the recipient agrees to ensure that all space for conferences, meetings, conventions or training seminars funded in whole or in part with federal funds complies with the protection and control guidelines of the Hotel and Motel Fire Safety Act (P.L. 101-391, as amended).

18. **Drug-Free Workplace** – Recipients of EPA assistance must make an ongoing, good faith effort to maintain a drug-free workplace pursuant to the specific requirements set forth in Title 2 CFR Part 1536 Subpart B. Additionally, in accordance with these regulations, the recipients must identify all known workplaces under its federal awards, and keep this information on file during the performance of the award.

19. **Resource Conservation and Recovery Act (RCRA)** – Consistent with goals of section 6002 of RCRA (42 U.S.C. 6962), State and local institutions of higher education, hospitals and non-profit organization recipients agree to give preference in procurement programs to the purchase of specific products containing recycled materials, as identified in 40 CFR Part 247.

Consistent with section 6002 of RCRA (42 U.S.C. 6962) and 2 CFR §200.322, State agencies or agencies of a political subdivision of a State and its contractors are required to purchase certain items made from recycled materials, as identified in 40 CFR Part 247, when the purchase price exceeds \$10,000 during the course of a fiscal year or where the quantity of such items acquired in the course of the preceding fiscal year was \$10,000 or more. Pursuant to 40 CFR §247.2 (d), the recipient may decide not to procure such items if they are not reasonably available in a reasonable period of time; fail to meet reasonable performance standards; or are only available at an unreasonable price.

20. **American Iron and Steel (Compliance with P.L. 113-76) – The Consolidated Appropriations Act of 2014 (Public Law 113-76), if applicable** – Includes an American Iron and Steel (AIS) requirement, if applicable. Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) assistance recipients are required to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment

works and if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act).

The appropriation language sets forth certain circumstances under which EPA may waive AIS requirements. Furthermore, the act exempts projects where engineering specifications and plans were approved by a state agency prior to January 17, 2014. §319(h) funded projects are excluded from this provision.

21. **Fly America Act (Compliance with 49 U.S.C. 40118)** – Includes air travel and cargo transportation services requirements. All air travel and cargo transportation services funded with Federal financial assistance are required to use United States flag carrier airlines. The only exception to this requirement is transportation provided under a bilateral or multilateral air transport agreement, to which the U.S. Government and the government of a foreign country are parties, and which the Department of Transportation has determined meet the requirements of the Fly America Act.

22. **Compliance with Clean Water State Revolving Fund Regulations (Title VI of the Clean Water Act, 40 CFR Part 35) , if applicable**, – Provides all applicable requirements of the EPA regulations and rules and procedures prescribed under the Clean Water State Revolving Funds Regulations.

23. **Compliance with Drinking Water State Revolving Fund Regulations (40 CFR Part 35 Subpart L), if applicable** – Provides details on the requirements and functions of the Drinking Water State Revolving Fund, authorized under the Safe Drinking Water Act.

24. **Compliance with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646)** – Provides for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

25. **Compliance with the provisions of the Hatch Act (5 U.S.C. 1501 – 1508 and 7324 – 7328)** – Limits the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

26. **Compliance with the Demonstration Cities and Metropolitan Act (P.L. 89-754)** – Related to comprehensive and cooperative programs for providing public facilities and services necessary to improve the general welfare of people living in underserved urban areas.

27. **Compliance with the EPA's Financial Assistance Conflict of Interest Policy (COI)** – As required by 2 CFR §200.112, the EPA has established a COI governing disclosure of actual and potential conflicts of interest by applicants for, and recipients of federal financial assistance awards from the EPA. This policy applies to individuals and non-Federal entities requesting and receiving EPA financial assistance on or after October 1, 2015.

28. **EPA Cybersecurity Conditions** – Recipients that collect and manage environmental data under this assistance agreement, agree they will protect the data by following all applicable State law cybersecurity requirements. Any connections between the recipient's network or information system and EPA networks used by the recipient to transfer data under this agreement must be secure. Any subawards made under this agreement will require the subrecipient to comply with these requirements and must be included in the subaward agreement.

29. **Energy and Environmental Conservation(40 CFR §30.44(a)(3)(vi))** – By accepting funds under this Agreement, the Grantee agrees to give preference, to the extent practical and economically feasible, to products and services that conserve natural resources and protect the environment and are energy efficient.

30. **Compliance with the Trafficking Victims Protection Act of 2000 (2 CFR Part 175)** – By accepting funds under this Agreement, the Grantee agrees to implement the requirements of (g) of section 106 of the Trafficking Victims Protection Act of 2000 (TVPA), as amended (22 U.S.C. 7104(g).

31. **Registrations and Identification Information** – The Grantee agrees to maintain current registration in the Central Contractor Registration ([www.ccr.gov](http://www.ccr.gov)) System for Award Management (SAM) at all times during which they have active project funded with these funds. A Dun and Bradstreet Data

Universal Numbering System (DUNS) Number ([www.dnb.com](http://www.dnb.com)) is one of the requirements for registration in the Central Contractor Registration.

**32. 41 U.S.C. 4712, Pilot Program for Enhancement of Recipient and Subrecipient Employee Whistleblower Protection** – This requirement applies to all awards issued after July 1, 2013 and shall be in effect until January 1, 2017.

(a) This award, related subawards, and related contracts over the simplified acquisition threshold and all employees working on this award, related subawards, and related contracts over the simplified acquisition threshold are subject to the whistleblower rights and remedies in the pilot program on award recipient employee whistleblower protections established at 41 U.S.C. 4712 by section 828 of the National Defense Authorization Act for Fiscal Year 2013 (P.L. 112-239). (b) Recipients, their subrecipients, and their contractors awarded contracts over the simplified acquisition threshold related to this award, shall inform their employees in writing, in the predominant language of the workforce, of the employee whistleblower rights and protections under 41 U.S.C. 4712.

(c) The recipient shall insert this clause, including this paragraph (c), in all subawards and in contracts over the simplified acquisition threshold related to this award.

**33. Financial Assistance Policy to Ban Text Messaging While Driving (75 Federal Register 60266, as amended and Presidential E.O. 13513)** –

(a) Definitions. As used in this clause –

“Driving” – Means operating a motor vehicle on an active roadway with the motor running, including while temporarily stationary because of traffic, a traffic light, stop sign, or otherwise. Does not include operating a motor vehicle with or without the motor running when one has pulled over to the side of, or off, an active roadway and has halted in a location where one can safely remain stationary.

“Text Messaging” – Means reading from or entering data into any handheld or other electronic device, including for the purpose of short message service texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any form of electronic data retrieval or electronic data communication. The term does not include glancing at or listening to a navigational device that is secured in a commercially designed holder affixed to the vehicle, provided that the destination and route are programmed into the device either before driving or while stopped in a location off the roadway where it is safe and legal to park.

(b) This clause implements Presidential Executive Order 13513, Federal Leadership on Reducing Text Messaging while Driving, dated October 1, 2009.

(c) The Applicant should –

i. Adopt and enforce policies that ban text messaging while driving – (i) Company-owned or –rented vehicles or Government-owned vehicles; or (ii) Privately-owned vehicles when on official Government business or when performing any work for or on behalf of the Government.

ii. Conduct initiatives in a manner commensurate with the size of the business, such as – (i) Establishment of new rules and programs or re-evaluation of existing programs to prohibit text messaging while driving; and (ii) Education, awareness, and other outreach to employees about the safety risks associated with texting while driving.

(d) Sub-agreements/sub-contracts. The Applicant shall insert the substance of this clause, including this paragraph (d), in all sub-agreement/sub-contracts that exceed the micropurchase threshold (\$3,000 per 2 CFR §200.67, set by 48 CFR Subpart 2.1).

## **ENVIRONMENTAL**

**34. Compliance with the Water Resources Reform and Development Act (WRRDA) P.L. 113-**

**121, if applicable** – Provides for improvements to the rivers and harbors of the United States, to provide for the conservation and development of water and related resources.

35. **Compliance, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234)** – Requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.

36. **Compliance with environmental standards which may be prescribed to the following** – (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Presidential Executive Order 11514; (b) notification of violating facilities pursuant to Presidential E.O. 11738; (c) protection of wetlands pursuant to Presidential E.O. 11990; (d) evaluation of flood hazards in floodplains in accordance with Presidential E.O. 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.); (f) conformity with Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205); (i) protection of coastal barriers under the Coastal Barrier Resources Act of 1982 (P.L. 97-348); (j) protection and conservation of wildlife resources under the Fish and Wildlife Coordination Act (16 U.S.C. 661-666c); (k) protection and conservation of migratory bird species under the Migratory Bird Treaty Act (16 U.S.C. 703-712); (l) protection and conservation of fishery resources under the Magnuson Stevens Fishery Conservation and Management Act (16 U.S.C. 1801-1882) (m) protection of chemical, physical, and biological integrity of the Nation's waters under Section 404 of the Clean Water Act (33 U.S.C. 1251 et seq. (1972)); (n) if applicable, application of the requirements set forth under the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et seq.); and (o) prevention of the spread of invasive plant species under Presidential E.O. 13112.

37. **Compliance with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.)** – Related to protecting components or potential components of the national wild and scenic rivers system.

38. **Compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), Presidential E.O. 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a-1 et seq.)**.

39. **Compliance with P.L. 93-348** – Regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

40. **Care and Use of Live Vertebrate Animals** – Non-federal entities must comply with the Laboratory Animal Welfare Act of 1966, as amended, (Pub. L. No. 89-544, 7 U.S.C. 2131 et seq.) (animal acquisition, transport, care, handling, and use in projects), and implementing regulations (9 CFR Parts 1, 2, and 3); the Endangered Species Act (16 U.S.C. 1531 et seq.); Marine Mammal Protection Act (16 U.S.C. 1361 et seq.) (taking possession, transport, purchase, sale, export or import of wildlife and plants); the Nonindigenous Aquatic Nuisance Prevention and Control Act (16 U.S.C. 4701 et seq.) (ensure preventive measures are taken or that probable harm of using species is minimal if there is an escape or release); and all other applicable statutes pertaining to the care, handling, and treatment of warm-blooded animals held for research, teaching, or other activities supported by Federal financial assistance.

41. **Compliance with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4801 et seq.)** – Prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

42. **Compliance with the mandatory standards and policies relating to energy efficiency** – Related to the State energy conservation plan issued in accordance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

43. **Compliance with Geospatial Data Standards** – Must be met by the Grantee under this Agreement. All geospatial data created must be consistent with Federal Geographic Data Committee endorsed standards. Information on these standards can be found at [www.fgdc.gov](http://www.fgdc.gov).



44. **Compliance the EPA's Green Infrastructure Policy (established by the American Recovery and Reinvestment Act) for the Clean Water State Revolving Fund Program, if applicable** – Provides guidance and a best practices guide for funding green infrastructure in the CWSRF program.

45. **Compliance with Nutrient Management Plans for Animal Feeding Operations** – Required under this Grant and must have and implement a nutrient management plan that: 1) provides and maintains buffers or equivalent practices; 2) diverts clean water; 3) prevents direct contact of confined animals with waters of the United States; 4) addresses animal mortality; 5) addresses chemical disposal; 6) addresses proper operation and maintenance; 7) addresses record keeping and testing; 8) maintains proper storage capacity; and, 9) addresses rate and timing of land application of manure and wastewater.

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General Decision Number: FL180136 01/05/2018 FL136

Superseded General Decision Number: FL20170136

State: Florida

Construction Type: Heavy

County: Highlands County in Florida.

HEAVY CONSTRUCTION PROJECTS (Including Sewer and Water Lines)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/05/2018

\* PAIN0088-007 07/01/2017

	Rates	Fringes
PAINTER: Brush and Spray.....	\$ 20.21	10.18
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SUFL2009-132 06/24/2009		

	Rates	Fringes
LABORER: Common or General.....	\$ 8.19	0.00
LABORER: Pipelayer.....	\$ 11.58	0.00
OPERATOR: Backhoe/Excavator.....	\$ 12.25	1.33
OPERATOR: Bulldozer.....	\$ 13.30	1.92
OPERATOR: Loader.....	\$ 14.13	1.94
TRUCK DRIVER: Distributor, Dump, Lowboy and Tandem.....	\$ 14.00	0.00
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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

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

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

#### Union Rate Identifiers

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

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

### Survey Rate Identifiers

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

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

### Union Average Rate Identifiers

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

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

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### WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION

**SECTION 00822**  
**FEDERAL REGULATIONS**

Formal regulations concerning administrative procedures for EPA grants appear in Title 40 of the Code of Federal Regulations (CFR) and 2 CFR Parts 1500 through 1599. Other EPA regulations also impact grant programs. The following list contains regulations and Office of Management and Budget Guidance which may apply to the work performed under this Agreement.	
<b>Subchapter A - General</b>	
40 CFR 4	Uniform relocation assistance and real property acquisition for federal and federally assisted programs
40 CFR 12	Nondiscrimination on the basis of handicap in programs or activities conducted by EPA
40 CFR 29	Intergovernmental review of EPA programs and activities
<b>Subchapter B – Grants and Other Federal Assistance</b>	
40 CFR 33.302	Additional contract administration requirements
40 CFR 33.501 (b) and (c)	Bidder’s list requirements and exemptions for recipients of a Continuing Environmental Program Grant or EPA financial assistance agreement to capitalize a revolving loan fund
40 CFR 34	New restrictions on lobbying
40 CFR 35	State and local assistance
<b>Other Federal Regulations</b>	
2 CFR 200 and 1500	Uniform administrative requirements, cost principles, and audit requirements for Federal awards
2 CFR 1532	Non procurement Debarment and Suspension Regulations
48 CFR 31	Contract Cost Principles and Procedures
40 U.S.C. 1101 <i>et seq.</i>	Procurement processes for architectural and engineering services, effective October 1, 2014.
<b>Office of Management and Budget Circulars</b>	
2 CFR Part 200	Uniform administrative requirements, cost principles, and audit requirements for Federal awards (State, Local and Indian Tribal Governments; Educational Institutes; Private Non Profit Organization other than (1) institute of higher education, (2) hospital, or (3) organization named in 2 CFR Part 200 Appendix VIII
2 CFR Part 200, Subpart F	Audit Requirements
48 CFR Part 31	Contract Cost Principles and Procedures (For Profit Organization)
<b>Accounting Standards</b>	
Governmental Entities	Subject to accounting standards established by the Government Accounting Standards Board (GASB)
Private Sector or Individuals	Subject to generally accepted accounting principles (GAAP), promulgated by the American Institute of Certified Public Accountants (AICPA), as applicable

**SECTION 00823**

**DISCLOSURE OF LOBBYING ACTIVITIES**

Approved by OMB  
0348-0046

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352  
(See reverse for public burden disclosure.)

<b>1. Type of Federal Action:</b> <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	<b>2. Status of Federal Action:</b> <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	<b>3. Report Type:</b> <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change <b>For Material Change Only:</b> year _____ quarter _____ date of last report _____
<b>4. Name and Address of Reporting Entity:</b> <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known:  Congressional District, if known: 4c	<b>5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:</b>  Congressional District, if known:	
<b>6. Federal Department/Agency:</b>	<b>7. Federal Program Name/Description:</b>  CFDA Number, if applicable: _____	
<b>8. Federal Action Number, if known:</b>	<b>9. Award Amount, if known:</b> \$ _____	
<b>10. a. Name and Address of Lobbying Registrant</b> <i>(if individual, last name, first name, MI):</i>	<b>b. Individuals Performing Services</b> <i>(including address if different from No. 10a)</i> <i>(last name, first name, MI):</i>	
<b>11.</b> Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____	
<b>Federal Use Only:</b>		Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)



## INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.  
  
(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.



OMB Control No. 2030-0020  
Approval expires 06/30/2017

United States  
**ENVIRONMENTAL PROTECTION AGENCY**  
Washington, DC 20460

**LOBBYING AND LITIGATION CERTIFICATION FOR GRANTS  
AND COOPERATIVE AGREEMENTS\***

**INSTRUCTIONS:**

\*At project completion, complete this form pursuant to the 2001 Department of Veterans Affairs and Housing and Urban Development, and Independent Appropriations Act, Public Law 106-377, Section 424 and 2000 Department of Veterans Affairs and Housing and Urban Development, and Independent Appropriations Act, Public Law 106-74, Section 426 and any other subsequent Appropriation Act requirements.

Please mail this form to your EPA Grant Specialist within 90 days of project completion. DO NOT send this information to the Office of Management & Budget.

Assistance Agreement Number(s):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby certify that none of these funds have been used to engage in the lobbying of the Federal Government or in litigation against the United States unless authorized under existing law.

\_\_\_\_\_  
Signature of the Chief Executive Officer

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name

**Burden Statement -** The annual public reporting and record keeping burden for this collection of information is estimated to average 5 minutes per respondent. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Regulatory Information Division, U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Mail Code 3213A, Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, N.W., Washington, DC 20503, Attention: Desk Officer for EPA. Include the EPA ICR number and OMB control number in any correspondence.

MBE WBE VENDORS SECTION 00825

Name	Contact	Address	City	State	Postal Code	County
Chuck Westberry Electrical Contractor, Inc.	Chuck Westberry	102 Moon Ranch Rd.	Sebring	FL	33870	Highlands
Delta Sebring, Inc.	Dawn Balsamo	526 Park Street	Sebring	FL	33870	Highlands
The Carol Group Inc.	Carol Howard	712 Sunset Pointe Drive	Lake Placid	FL	33852	Highlands
Absolute Temperature Controls llc	cosmas allen	116 hillcrest dr	davenport	FL	33897	Polk
Advertising Solutions And Printing, LLC	Nikki Smith	3191 Recker Highway	Winter Haven	FL	33880	Polk
AirQuest Environmental, Inc.	Traci-Anne Boyle	6851 SW 45 ST	Davie	FL	33314	Broward
AirQuest Environmental, Inc.	Traci-Anne Boyle	2000 S Florida Avenue	Lakeland	FL	33803	Polk
Albe Stamp & Engraving	Gail Martin	2020 S. Combee Rd.	Lakeland	FL	33801	Polk
All Earth Landscaping	Lasheka Ware	1868 Emily Dr	Winter Haven	FL	33884	Polk
Americoat Corporation	Shrikant Desai	POBOX2228	EATON PARK	FL	33840	Polk
AnointedHandz Cleaning Service LLC	Janan Hamilton	2557 Everleth Dr	Lakeland	FL	33810	Polk
ARTIS ENTERPRISES LLC	JOHN ARTIS	937 BLOOMINGDALE DR.	DAVENPORT	FL	33897	Polk
Atline Electric Services LLC	Lois Capers	2316 Hamlet Circle	Lakeland	FL	33810	Polk
Auburndale Fruit Co., Inc	Jennifer Helms	4970 Lake Lowery Rd	Lake Alfred	FL	33850	Polk
AVON MODULAR	Alan de Zayas	1074 South Florida Avenue	Lakeland	FL	33803	Polk
AVON MODULAR	Alan de Zayas	1074 South Florida Avenue	Lakeland	FL	33803	Polk
Avon Modular,LLC.	Alan B deZayas	1074 S Florida Av.	Lakeland	FL	33803	Polk
AWC Pool Remodeling Inc	Charles Wilson	P.O. BOX 4059	WINTER HAVEN	FL	33885	Polk
AWC Pool Remodeling Inc	Charles Wilson	P.O. BOX 4059	Winter Haven	FL	33881	Polk
AWC Pool Remodeling, Inc.	Charles Wilson, Sr	549 Avenue T NE	Winter Haven	FL	33881	Polk
Blackmon Roberts Group, Inc.	Sylvia Blackmon-Roberts	902 South Florida Avenue,	Lakeland,	FL	33803	Polk
Clark Environmental, Inc.	Megan Hall	755 Prairie Industrial Pkwy	Mulberry	FL	33860	Polk
Clark/Nikdel, Inc.	Melea Gernert	62 4th Street NW	Winter Haven	FL	33881	Polk
CO Services LLC	Michael Covington	P.O. Box 1500	Eagle Lake	FL	33839	Polk
CO Services LLC	Michael Covington	12 W Eagle Ave	Eagle Lake	FL	33839	Polk
Collins Survey Consulting LLC	Dianne Collins	5915 Lake Luther Rd	Lakeland	FL	33805	Polk
Compass Real Estate Consulting Inc.	Shawn Wilson	120 East Pine Street	Lakeland	FL	33801	Polk
Computer Merchandise Corporation	Tim McNabb	P.O. Box 6129	Lakeland	FL	33807-6129	Polk
Deans Environmental Services LLC	Kyle Dean	2126 Whispering Trails Blvd	Winter Haven	FL	33884	Polk
Digitech of Lakeland, Inc. dba Digitech Graphics	Barbara Balingit	3020 Winter Lake Road	Lakeland	FL	33803	Polk
Document Advantage Corporation	Jana Wiggins	6039 Cypress Gardens Blvd	Winter Haven	FL	33884	Polk
Douglass Screen Printers, Inc.	Debbie Carrigan	2710 New Tampa Hwy	Lakeland	FL	33815	Polk
DUFFY AND LEE COMPANY	EDITH DUFFY	3333 S W 13TH AVENUE	FT. LAUDERDALE	FL	33315	Broward
DUFFY AND LEE COMPANY	EDITH DUFFY	4960 LAKELAND COMMERCIAL	LAKELAND	FL	33805	Polk
E & A Cleaning, Inc.	Jeremiah Johnston	529 W. Brannen Rd.	Lakeland	FL	33813	Polk



Engineered Design Services LLC	Craig McKenzie	2028 Shepherd Road #207	Mulberry	FL	33860	Polk
Exclusive Contractors, Inc.	Liz Burse	277 S. 10th avenue	Bartow	FL	33830	Polk
Exclusive Contractors, Inc.	Liz Burse	277 S. 10th avenue	Bartow	FL	33830	Polk
F & F Case Management, Inc	Jane Nolte-Wiener	PO Box 6900	Lakeland	FL	33807	Polk
F & F Case Management, Inc	Jane Nolte-Wiener	PO Box 6900	Lakeland	FL	33807	Polk
Fisher's Landscape Maintenance	Michael Fisher	923 Jere Circle	Lakeland	FL	33801-3023	Polk
Florida General Coatings,inc.	Valeria Nyaga-Ireri	5933 Velvet Loop	Lakeland	FL	33811	Polk
Full Circle Concrete Core Drilling LLC	Thomas Creelman	4482 Creekside Dr.	Mulberry	FL	33860	Polk
FURTAH, INC	CINDY ADAMS	1350 E Main Street Suite C1	Bartow	FL	33831	Polk
Gallies Enterprise, Inc	Basil Gallimore	425 Rio grande Court	Kissimmee	FL	34759	Polk
GLT OFFICE SUPPLY, INC	BRENDA WISE	P.O. Box 3829	Lakeland	FL	33802-3829	Polk
Gulf Coast Avionics Corporation	Rick Garcia	3650 Drane Field Rd.	Lakeland	FL	33811	Polk
Heart of Gold Senior Services	lisa wade	209 fern rd	winter haven	FL	33880	Polk
Human Capital Resources and Concepts Inc	Marnice Miller	128 Palmetto Ave NW	Lakeland	FL	33881	Polk
Hydro Solutions Consulting LLC	Roberto Beltran	3616 Harden Blvd	Lakeland	FL	33803	Polk
Hydro Solutions Consulting LLC	Roberto Beltran	3616 Harden Blvd	Lakeland	FL	33803	Polk
IMPERIAL TESTING & ENGINEERING	AL MCGHIN	3905 KIDRON RD	LAKELAND	FL	33811-1293	Polk
International Sun Travel Agency, Inc.	Blanche Bryant	705 East Main Street	Bartow	FL	33830	Polk
Investments by Lizzie, Inc.	Lizzie Wilson	702 El Paseo Drive	Lakeland	FL	33805	Polk
Jack Harris Design	Jack Harris	1074 South Florida Av.	Lakeland	FL	33881	Polk
Jarrett Gordon Ford, Inc.	Anthony Gordon	2600 Access Rd N.W.	Davenport	FL	33897	Polk
JD HealthCare Partners, LLC	Darrell Contreras	1644 Skinner Street	Lakeland	FL	33801	Polk
Jerue Logistics Solutions, LLC	Stephanie Johnson	20 3rd Street SW	Winter Haven	FL	33807	Polk
Jerue Logistics Solutions, LLC	Stephanie Johnson	3200 Flightline Dr. Ste. 101	Lakeland	FL	33811	Polk
KAY-LOU LLC	Sheri Jenkins	1207 Greenview Dr	Lakeland	FL	33805	Polk
Kyra Solutions, Inc. (formerly known as Kyra Info1	Rupal Patel	4454 Florida National Drive	Lakeland	FL	33813	Polk
Kyra Solutions, Inc. (formerly known as Kyra Info1	Rupal Patel	4454 Florida National Drive	Lakeland	FL	33813	Polk
Landmark Civil Services LLC	julie garrard	5578 commercial blvd	winter haven	FL	33880	Polk
LMR Construction, Inc.	Luis Montanez	997 Dawes Rd	Frostproof	FL	33843	Polk
Mabe Production and Installation, Inc.	Lorraine Mabe	924 Fairlane Drive	Lakeland	FL	33809	Polk
MCD Geosciences and Engineering, Inc.	Heather Cain	331 S. First Street	Lake Wales	FL	33853	Polk
MDM Services, Inc.	Dhivy Sathianathan	1055 Kathleen Road	Lakeland	FL	33805	Polk
Mercurial, LLC	Karyn Barker	1109 Lake Point Terrace	Lakeland	FL	33813	Polk
Mercurial, LLC	Karyn Barker	41 Orange Avenue	Rockledge	FL	32955	Brevard
Multicultural Marketing Services, Inc.	Emma Lawson	P. O. Box 2713	Haines City	FL	33845	Polk
Multicultural Marketing Services, Inc.	Emma Lawson	P. O. Box 2713	Haines City	FL	33845	Polk

Office Furniture Depot	Joanne Boles	2440 U.S. Highway 98, N.	Lakeland	FL	33805	Polk
Office Furniture Depot	Joanne Boles	2440 U.S. Highway 98, N.	Lakeland	FL	33805	Polk
One Source Solutions Logistics LLC	Karen Johnson	PO Box 93163	Lakeland	FL	33804	Polk
Parry's Lawn & Landscape, Inc.	Tiffany Parry	P.O. Box 2810	Lakeland	FL	33806	Polk
Patel, Greene, & Associates, PLLC	Hiren Patel	555 West Main Street	Bartow	FL	33830	Polk
PATRIOT SUPPIERS	WILLIAM MOREY	1424 Royal Forest Loop	Lakeland	FL	33811	Polk
patriot suppliers	William Morey	1424 Royal Forest Loop	Lakeland	FL	33811	Polk
Perpetual Technology Solutions	Connie Nickerson	2525 Drane Field Rd Ste 10	Lakeland	FL	33811	Polk
Perpetual Technology Solutions	Connie Nickerson	2525 Drane Field Road	Lakeland	FL	33811	Polk
Perpetual Technology Solutions	Connie Nickerson	2525 Drane Field Rd. Suite 10	Lakeland	FL	33811	Polk
Phoslab Environmental Services Inc.	George Fernandez	806 w.beacon rd.	lakeland	FL	33803	Polk
Platinum Services Group, LLC	Rene LaPorte	561 Harriswod Ct	Davenport	FL	33837	Polk
Premiere Commercial Furntiture & Design, LLc	Vicki White	160 Fitzgerald Road	Lakeland, FL	FL	33813	Polk
ProPlus Products, Inc.	Holly Lyle	PO Box 426	bowling Green	FL	33834	Polk
Pyramid Fasteners	Theresa Pickard	620 South First Avenue	Bartow	FL	33830	Polk
Rita Temporaries Inc dba Rita Staffing	Rich Hames	PO Box 6955	Lakeland	FL	33807	Polk
Robby's Septic Tank Service, Inc.	Beverly McLaughlin	9158 Hall Road	Lakeland	FL	33809-1507	Polk
Robby's Septic Tank Service, Inc.	Beverly McLaughlin	9158 Hall Road	Lakeland	FL	33809-1507	Polk
S.E. McDonough & Associates, Inc.	Susan McDonough	4921 Southfork Drive	Lakeland	FL	33813	Polk
Seminole Brand Development	Allison Lee	650 Avenue R S.W.	Winter Haven	FL	33880	Polk
Seminole Brand Development LLC	Connie West	P O Box	Winter Haven	FL	33882	Polk
SLS Publications, LLC	Lori Madden	5050 Ralston Road	Lakeland	FL	33811	Polk
SPRINGER CONSTRUCTION INC	Brandon Shelley	2622 Lonhorn Dr.	LAKELAND, FLO	FL	33801	Polk
STAG Industries LLC	Michelle Stagner	5718 Yates Road	Lakeland	FL	33811	Polk
T GREGORY CONSTRUCTION, INC	Gregory Bell	2204 2nd Street N.E.	Winter Haven	FL	33881	Polk
T GREGORY CONSTRUCTION, INC	Gregory Bell	2204 2nd Street N.E.	Winter Haven	FL	33881	Polk
The A. D. Morgan Corporation	Rebecca Smith	716 N. Renellie Dr.	Tampa	FL	33609	Hillsborough
The A. D. Morgan Corporation	Rebecca Smith	109 King Street	Cocoa	FL	32922	Brevard
The A. D. Morgan Corporation	Rebecca Smith	2411 Manatee Avenue W	Bradenton	FL	34205	Manatee
The A. D. Morgan Corporation	Rebecca Smith	1661 Williamsburg Square	Lakeland	FL	33806	Polk
The A. D. Morgan Corporation	Rebecca Smith	3405 SW College Road	Ocala	FL	34474	Marion
The A. D. Morgan Corporation	Rebecca Smith	716 N. Renellie Dr.	Tampa	FL	33609	Hillsborough
The A. D. Morgan Corporation	Rebecca Smith	109 King Street	Cocoa	FL	32922	Brevard
The A. D. Morgan Corporation	Rebecca Smith	2411 Manatee Avenue W	Bradenton	FL	34205	Manatee
The A. D. Morgan Corporation	Rebecca Smith	1661 Williamsburg Square	Lakeland	FL	33806	Polk
The A. D. Morgan Corporation	Rebecca Smith	3405 SW College Road	Ocala	FL	34474	Marion

The Bush Global Group Corporation	Marshall Bush	1384 East MLK Drive	Bartow	FL	33830-5226	Polk
The Bush Global Group Corporation	Marshall Bush	1032 E. MLK Drive	Bartow	FL	33830	Polk
The Hampton Educational Services Group, Inc.	Celeste Hamilton	313 Dolphin Way	Kissimmee	FL	34759	Polk
TMJ Construction	mercia Burt	935 Tangelo Circle	Bartow	FL	33831	Polk
TMJ Construction	mercia Burt	935 Tangelo Circle	Bartow	FL	33831	Polk
WATTS CONSTRUCTION, INC.	NICOLE WATTS	123 Lesall Drive, West	Haines City	FL	33844	Polk
WATTS CONSTRUCTION, INC.	NICOLE WATTS	123 Lesall Drive, West	Haines City	FL	33844	Polk
Xcellent Xteriors	ryan edrington	4146 shade tree ln	lakeland	FL	33812	Polk
Xtremely Clean Janitorial Service, LLC.	Wanda Barton	po box 1434	Highland City	FL	33846	Polk
Hardee County Disposal, Inc.	Sophia Bonjokian	P.O. Box 606	Wauchula	FL	33873	Hardee
WD Environmental Inc.	Charlotte Terrell	1013 Briarwood Drive	Wauchula	FL	33873	Hardee

Email	Phone
chuck@chuckwestberry.com	863-385-9501
dbalsamo@deltasebring.com	863-314-6032
carolannh2o@gmail.com	941-662-0184
absolutetemperaturecontrols@gmail.com	407-362-8170
nikki@asapone.com	863-291-6807
orders@AirQuestInc.com	954-792-4549
orders@airquestinc.com	954-792-4549
albestamp@aol.com	863-667-0778
AllEarthLandscaping@gmail.com	863-298-6796
AMERICOATUSA@YAHOO.COM	863-667-1035
anointedhandz@tampabay.rr.com	863-206-4128
ARTISENTERPRISELLC@GMAIL.COM	517-505-1048
atlineelectric@yahoo.com	863-934-1337
jhelms@auburndalefruit.com	863-956-1600
avonmodular@tampabay.rr.com	866-434-6889
avonmodular@tampabay.rr.com	866-434-6889
avonmodular@tampabay.rr.com	866-434-6889
coolshade2@verizon.net	863-293-8701
coolshade2@verizon.net	863-293-8701
coolshade2@verizon.net	863-293-8701
sylvia@blackmonroberts.com	863-802-1280
mhall@clarkenvironmental.com	863-425-4884
melea@nikdel.com	863-299-9980
rconsult-mike@tampabay.rr.com	863-877-0595
mikec@coservicesllc.com	863-877-0595
dcollins@collinssurvey.com	863-937-9052
shawn@shawnwilson.com	863-688-3614
contactus@cmcdata.com	863-644-0617
deank8859@aol.com	863-595-8255
barbara@dtechgraphics.com	863-668-8770
jana.wiggins@docuvantage.com	863-326-6360
dcarrigan@dsp-cando.com	800-888-8545
DUFFYLEE@AOL.COM	954-467-1288
DUFFYLEE@AOL.COM	954-467-1288
eacleaning@verizon.net	863-644-4927

craigmckenzie@edsengineers.com	863-354-3026
roadcontractor2@yahoo.com	863-559-1039
roadcontractor2@yahoo.com	863-559-1039
jan5444@aol.com	800-282-9101
jan5444@aol.com	800-282-9101
33801302@tampabay.rr.com	863-665-3982
nyaga@tampabay.rr.com	863-698-4587
fullcircledrilling@gmail.com	813-704-5910
cadams@mbamedi-test.com	863-533-7484
galliesride@gmail.com	866-611-5471
bjwise2@gltooffice.com	800-393-9473
RG122260@aol.com	863-709-9714
heartofgoldsrsvs@yahoo.com	863-595-8927
marnice.miller@hcrconcepts.com	3013510724
RBeltransr@Hydrosc.com	863-559-2472
RBeltransr@Hydrosc.com	863-559-2472
al@imperialtesting.com	863-647-2877
blanche@intlsun.webmail.com	863-533-0511
investbiblically1@gmail.com	8634305855
jackharrisdesign@yahoo.com	863-877-5902
anthonygordon@jarrettford.com	863-422-1167
invoice@jdhealthcarepartners.com	863-797-9917
sjohnson@jerue.com	863-607-5616
sjohnson@jerue.com	863-607-5616
kay.lou.llc@gmail.com	813-312-4279
rpatel@kyrasolutions.com	863-686-2271
rpatel@kyrasolutions.com	863-686-2271
julieg@garrardinc.com	863-967-3992
lmr_montanez@hotmail.com	863-635-4651
lorraine@mabepro.com	863-859-2354
hcain@sinkhole-expert.com	863-676-2600
dhivy@mdmservices.com	863-646-9130
bids@mercurialcreative.com	863-712-6007
bids@mercurialcreative.com	863-712-6007
eglawson@hotmail.com	863-422-8849
eglawson@hotmail.com	863-422-8849



marshallb@bushglobalgroup.com	407-655-9776
marshallb@bushglobalgroup.com	407-655-9776
thehampton_group@yahoo.com	305-332-3097
tmjconstruction@rocketmail.com	863-559-5868
tmjconstruction@rocketmail.com	863-559-5868
nickiwatts@aol.com	863-412-1039
nickiwatts@aol.com	863-412-1039
lakelandpressurewashing@gmail.com	863-838-6850
xtremelycleanjanitorialservice@gmail.com	863-660-9199
sbonjokian@yahoo.com	863-773-6079
charlotteterrell@earthlink.net	863-781-6971

**SECTION 00826**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY AND**  
**COOPERATIVE AGREEMENTS**  
**MBE/WBE UTILIZATION UNDER FEDERAL GRANTS**

OMB CONTROL NO. 2030-0020  
APPROVED: 06/30/2014  
APPROVAL EXPIRES: 06/30/2017

**FOR COOPERATIVE AGREEMENTS OR OTHER FEDERAL FINANCIAL ASSISTANCE WHERE THE COMBINED TOTAL OF FUNDS BUDGETED FOR PROCURING SUPPLIES, EQUIPMENT, CONSTRUCTION OR SERVICES EXCEED \$150,000.**  
**PART 1: PLEASE REVIEW INSTRUCTIONS BEFORE COMPLETING**

1A. FEDERAL FISCAL YEAR (Oct 1- Sep 30)

20\_\_\_\_\_

1B. REPORT TYPE

Annual  Last Report (Project completed)

1C. REVISION OF A PRIOR YEAR REPORT?  No  Yes, Year \_\_\_\_\_ IF YES, BRIEFLY DESCRIBE THE REVISIONS YOU ARE MAKING:

2A. EPA FINANCIAL ASSISTANCE OFFICE ADDRESS (ATTN: DBE COORDINATOR)

3A. RECIPIENT NAME AND ADDRESS

2B. EPA DBE COORDINATOR

Name:  
Email:  
Phone:  
Fax:

3B. RECIPIENT REPORTING CONTACT

Name:  
Address:  
Phone:  
Email:

4A. FINANCIAL ASSISTANCE AGREEMENT ID NUMBER  
(SRF State Recipients, refer to Instructions for Completion of blocks 4A, 5A and 5C)

4B. FEDERAL FINANCIAL ASSISTANCE PROGRAM TITLE OR CFDA NUMBER:

5A. TOTAL ASSISTANCE AGREEMENT AMOUNT

EPA Share: \$ \_\_\_\_\_

Recipient Share: \$ \_\_\_\_\_

N/A (SRF Recipient)

5B. If NO procurements and NO accomplishments were made this reporting period (by the recipients, sub-recipients, loan recipients, and prime contractors), **CHECK and SKIP to Block No. 7.** (Procurements are all expenditures through contract, order, purchase, lease or barter of supplies, equipment, construction, or services needed to complete Federal assistance programs. Accomplishments, in this context, are procurements made with MBEs and/or WBEs.)

5C. Total Procurements This Reporting Period (Only include amount not reported in any prior reporting period)  
Total Procurement Amount \$ \_\_\_\_\_  
(Include total dollar values awarded by recipient, sub-recipients and SRF loan recipients, including MBE/WBE expenditures.)

5D. Were sub-awards issued under this assistance agreement? Yes \_\_\_ No \_\_\_  
Were contracts issued under this assistance agreement? Yes \_\_\_ No \_\_\_

5E. MBE/WBE Accomplishments This Reporting Period  
Actual MBE/WBE Procurement Accomplished (Include total dollar values awarded by recipient, sub-recipients, SRF loan recipients and Prime Contractors.)

	Construction	Equipment	Services	Supplies	Total
\$MBE:	_____	_____	_____	_____	_____
\$WBE:	_____	_____	_____	_____	_____

6. COMMENTS: (If no MBE/WBE procurements, please summarize how certified MBEs/WBEs were notified of the opportunities to compete for the procurement dollars entered in Block 5C and why certified MBEs /WBEs were not awarded any procurements during this reporting period.)



7. NAME OF RECIPIENT'S AUTHORIZED REPRESENTATIVE	TITLE
8. SIGNATURE OF RECIPIENT'S AUTHORIZED REPRESENTATIVE	DATE

EPA FORM 5700-52A available electronically at [http://www.epa.gov/osbp/pdfs/5700\\_52a.pdf](http://www.epa.gov/osbp/pdfs/5700_52a.pdf)




Type of Product or Service Codes:

1 = Construction    2 = Supplies    3 = Services    4 = Equipment

Note: Recipients are required to submit MBE/WBE reports to EPA beginning with the Federal fiscal year the recipients receive the award, continuing until the project is completed.

DEP Agreement No. NF023, Attachment C, Page 2 of 7

319\_FY16-17

## Instructions:

### A. General Instructions:

MBE/WBE utilization is based on 40 CFR Part 33. The reporting requirement reflects the class deviation issued on November 8, 2013, clarified on January 9, 2014 and modified on December 2, 2014. EPA Form 5700-52A must be completed annually by recipients of financial assistance agreements where the combined total of funds budgeted for procuring supplies, equipment, construction or services exceeds \$150,000. This reporting requirement applies to all new and existing awards and voids all previous reporting requirements.

In determining whether the \$150,000 threshold is exceeded for a particular assistance agreement, the analysis must focus on funds budgeted for procurement under the supplies, equipment, construction, services or "other" categories, and include funds budgeted for procurement under sub-awards or loans

Reporting will also be required in cases where the details of the budgets of sub-awards/loans are not clear at the time of the grant awards and the combined total of the procurement and subawards and/or loans exceeds the \$150,000 threshold.

When reporting is required, all procurement actions are reportable, not just the portion which exceeds \$150,000.

If at the time of award the budgeted funds exceed \$150,000 but actual expenditures fall below, a report is still required.

If at the time of award, the combined total of funds budgeted for procurements in any category is less

than or equal to \$150,000 and is maintained below the threshold, no DBE report is required to be submitted.

Recipients are required to report 30 days after the end of each federal year, per the terms and conditions of the financial assistance agreement.

Last reports are due October 30<sup>th</sup> or 90 days after the end of the project period, whichever comes first.

MBE/WBE program requirements, including reporting, are material terms and conditions of the financial assistance agreement.

### B. Definitions:

**Procurement** is the acquisition through contract, order, purchase, lease or barter of supplies, equipment, construction or services needed to accomplish Federal assistance programs.

A **contract** is a written agreement between an EPA recipient and another party (also considered "prime contracts") and any lower tier agreement (also considered "subcontracts") for equipment, services, supplies, or construction necessary to complete the project. This definition excludes written agreements with another public agency. This definition includes personal and professional services, agreements with consultants, and purchase orders.

A **minority business enterprise (MBE)** is a business concern that is (1) at least 51 percent owned by one or more minority individuals, or, in the case of a publicly owned business, at least 51 percent of the stock is owned by one or more minority individuals; and (2) whose daily business operations are managed and directed by one or more of the minority owners. In order to qualify

and participate as an MBE prime or subcontractor for EPA recipients under EPA's DBE Program, an entity must be properly certified as required by 40 CFR Part 33, Subpart B.

U.S. citizenship is required. Recipients shall presume that minority individuals include Black Americans, Hispanic Americans, Native Americans, Asian Pacific Americans, or other groups whose members are found to be disadvantaged by the Small Business Act or by the Secretary of Commerce under section 5 of Executive order 11625. The reporting contact at EPA can provide additional information.

A **woman business enterprise (WBE)** is a business concern that is, (1) at least 51 percent owned by one or more women, or, in the case of a publicly owned business, at least 51 percent of the stock is owned by one or more women and (2) whose daily business operations are managed and directed by one or more of the women owners. In order to qualify and participate as a WBE prime or subcontractor for EPA recipients under EPA's DBE Program, an entity must be properly certified as required by 40 CFR Part 33, Subpart B.

Business firms which are 51 percent owned by minorities or women, but are in fact not managed and operated by minorities or females do not qualify for meeting MBE/WBE procurement goals. U.S. Citizenship is required.

### **Good Faith Efforts**

A recipient is required to make the following good faith efforts whenever procuring construction, equipment, services, and supplies under an EPA financial assistance agreement. These good faith efforts for utilizing MBEs and WBEs must be documented. Such documentation is subject to EPA review upon request:

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.

2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.

3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.

4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.

5. Use the services and assistance of the SBA and the Minority Business Development Agency of the Department of Commerce.

6. If the prime contractor awards subcontracts, require the prime contractor to take the steps in paragraphs (a) through (e) of this section.

### **C. Instructions for Part I:**

1A. Specify Federal fiscal year this report covers. The Federal fiscal year runs from October 1st through September 30th (e.g. **November 29, 2014 falls within Federal fiscal year 2015**)

1B. Specify report type. Check the annual reporting box. Also indicate if the project is completed.

1C. Indicate if this is a revision to a previous year and provide a brief description of the revision you are making.

2A-B. Please refer to your financial assistance agreement for the mailing address of the EPA financial assistance office for your agreement.

The "EPA DBE Reporting Contact" is the DBE Coordinator for the EPA Region from which your financial assistance agreement was originated. For a list of DBE Coordinators please refer to the EPA OSBP website at [http://epa.gov/osbp/dbe\\_cord](http://epa.gov/osbp/dbe_cord).

3A-B. Identify the agency, state authority, university or other organization which is the recipient of the Federal financial assistance and the person to contact concerning this report.

4A. Provide the Assistance Agreement number assigned by EPA. A separate report must be submitted for each Assistance Agreement.

**\*For SRF recipients:** In box 4a list numbers for ALL OPEN Assistance Agreements being reported on this form.

4B. Refer back to Assistance Agreement document for this information.

5A. Provide the total amount of the Assistance Agreement which includes Federal funds plus

recipient matching funds and funds from other sources.

**\*For SRF recipients only:** SRF recipients will not enter an amount in 5a. SRF recipients should check the "N/A" box.

5B. Self-explanatory.

5C. Provide the total dollar amount of **ALL** procurements awarded this reporting period by the recipient, sub-recipients, and SRF loan recipients, **including** MBE/WBE expenditures, not just the portion which exceeds \$150,000. For example: Actual dollars for procurement from the procuring office; actual contracts let from the contracts office; actual goods, services, supplies, etc., from other sources including the central purchasing/ procurement centers).

**\*NOTE:** To prevent double counting on line 5C, if any amount on 5E is for a subcontract and the prime contract has already been included on Line 5C in a prior reporting period, then report the amount going to MBE or WBE subcontractor on line 5E, but exclude the amount from Line 5C. To include the amount on 5C again would result in double counting because the prime contract, which includes the subcontract, would have already been reported.

**\*For SRF recipients only:** In 5c please enter the total annual procurement amount under all of your SRF Assistance Agreements. The figure reported in this section is **not** directly tied to an individual Assistance Agreement identification number. **(SRF state recipients report state procurements in this section)**

5D. State whether or not sub-awards and/or subcontracts have been issued under the financial assistance agreements by indicating “yes” or “no”.

5E. Where requested, also provide the total dollar amount of all MBE/WBE procurement awarded during this reporting period by the recipient, sub-recipients, SRF loan recipients, and prime contractors in the categories of construction, equipment, services and supplies. These amounts include Federal funds plus recipient matching funds and funds from other sources.

6. If there were no MBE/WBE accomplishments this reporting period, please briefly how certified MBEs/WBEs were notified of the opportunities to compete for the procurement dollars entered in Block 5C and why certified MBEs /WBEs were not awarded any procurements during this reporting period.

7. Name and title of official administrator or designated reporting official.

8. Signature, month, day, and year report submitted.

**D. Instructions for Part II:**

For each MBE/WBE procurement made under this financial assistance agreements during the reporting period, provide the following information:

1. Check whether this procurement was made by the recipient, sub-recipient/SRF loan recipient, or the prime contractor.

2. Check either the MBE or WBE column. If a firm is both an MBE and WBE,

the recipient may choose to count the entire procurement towards EITHER its MBE or WBE accomplishments. The recipient may also divide the total amount of the procurement (using any ratio it so chooses) and count those divided amounts toward its MBE and WBE accomplishments. If the recipient chooses to divide the procurement amount and count portions toward its MBE and WBE accomplishments, please state the appropriate amounts under the MBE and WBE columns on the form. **The combined MBE and WBE amounts for that MBE/WBE contractor must not exceed the “Value of the Procurement” reported in column #3**

3. Dollar value of procurement.

4. Date of procurement, shown as month, day, year. Date of procurement is defined as the date the contract or procurement was awarded, **not** the date the contractor received payment under the awarded contract or procurement, unless payment occurred on the date of award. **(Where direct purchasing is the procurement method, the date of procurement is the date the purchase was made)**

5. Using codes at the bottom of the form, identify type of product or service acquired through this procurement (e.g., enter 1 if construction, 2 if supplies, etc.).

6. Name, address, and telephone number of MBE/WBE firm.

\*\*This data is requested to comply with provisions mandated by: statute or regulations (40 CFR Parts 30, 31, and 33 and/or 2 CFR Parts 200 and 1500); OMB Circulars; or added by EPA to ensure sound and effective assistance management. Accurate, complete data are required to obtain funding, while no pledge of confidentiality is provided.

The public reporting and recording burden for this collection of information is estimated to average 1 hour per response annually. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclosure or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, OPPE Regulatory Information Division, U.S. Environmental Protection Agency (2136), 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB Control number in any correspondence. Do not send the completed form to this address.



**DIVISION 0 - SECTION 00836  
WAIVER OF RIGHT TO CLAIM  
AGAINST THE PUBLIC CONSTRUCTION BOND  
(FINAL PAYMENT)**

The undersigned, in consideration of the final payment in the amount of \$ \_\_\_\_\_, hereby waives its right to claim against the Public Construction Bond for labor, services, or materials furnished to \_\_\_\_\_ on the job of Highlands County, a political subdivision of the State of Florida, for improvements to the following described project: ISTOKPOGA MARSH WATER IMPROVEMENT PROJECT- PHASE 2; Project No. 14041.

DATED ON \_\_\_\_\_, 20\_\_\_\_.

By: \_\_\_\_\_

IN WITNESS WHEREOF \_\_\_\_\_ have (has) hereunto set hand and seal this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

WITNESS:

\_\_\_\_\_

(Seal)

Print Name: \_\_\_\_\_

SWORN AND SUBSCRIBED TO BEFORE ME THIS \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public  
State of Florida-at-Large

My Commission Expires: \_\_\_\_\_

**WAIVER OF RIGHT TO CLAIM  
AGAINST THE PAYMENT BOND  
(PROGRESS PAYMENT)**

The undersigned, in consideration of the sum of \$ \_\_\_\_\_, hereby waives its right to claim against the Public Construction Bond for labor, services, or materials furnished through (insert date) to (insert the name of your customer) on the job of (Highlands County, a political subdivision of the State of Florida), for improvements to the following described project: ISTOKPOGA MARSH WATER IMPROVEMENT PROJECT-PHASE 2; Project No. 14041. This waiver does not cover any retention or any labor, services, or materials furnished after the date specified.

DATED ON \_\_\_\_\_, 20 \_\_\_\_.

By: \_\_\_\_\_

IN WITNESS WHEREOF \_\_\_\_\_ have (has) hereunto set hand and seal this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

WITNESS:

\_\_\_\_\_

(Seal)

Print Name: \_\_\_\_\_

SWORN AND SUBSCRIBED TO BEFORE ME THIS \_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

\_\_\_\_\_  
Notary Public  
State of Florida-at-Large

My Commission Expires: \_\_\_\_\_

**SECTION 00861**

**TRENCH SAFETY COMPLIANCE**

THE INFORMATION ON THIS FORM SHOULD BE TYPED OR CLEARLY PRINTED.

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC BY AN OFFICER AUTHORIZED TO ADMINISTER OATHS.

Bidder acknowledges that he is solely responsible for complying with the Florida Trench Safety Act (Act) and Occupational Safety and Health Administrations excavation safety standard 29 CFR 1926.650-.652 (Subpart P as amended). Bidder further acknowledges that included in the various items of the proposal and in the Total Bid Price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) effective October 1, 1990. The bidder further identifies the costs of compliance as summarized herein.

1. This Sworn Statement is submitted with Bid No. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_(Project).
2. This Sworn Statement is submitted by \_\_\_\_\_,  
whose business address is \_\_\_\_\_  
and (if applicable) its Federal Employer Identification Number (FEIN) is  
\_\_\_\_\_.
3. My name is \_\_\_\_\_
4. The undersigned assures that the entity will comply with the applicable Trench Safety Standards and agrees to indemnify and hold harmless the OWNER, CONSTRUCTION MANAGER and ENGINEER, and any of their agents or employees from any claims arising from the failure to comply with said standard.
5. The undersigned has appropriated \$ \_\_\_\_\_ (Total Cost)  
for trenches to be excavated over 5' deep for compliance with the applicable standards and intends to comply by instituting the following procedures:

Ref. No.	Trench Safety Measure (Description)	Units of Measure (LF, SY)	Quantity of Units	Unit Cost	Extended Cost

6. The undersigned has appropriated \$ \_\_\_\_\_ (Total Cost) for compliance with shoring safety requirements and intends to comply by instituting the following procedures:

Ref. No.	Trench Safety Measure (Description)	Units of Measure (LF, SY)	Quantity of Units	Unit Cost	Extended Cost
Total Cost					

7. The undersigned, in submitting this Bid, represents that he has reviewed and considered all available geotechnical information and made such other investigations and tests as he may deem necessary for adequate design of the trench (and shoring) safety system(s) he will utilize on this project.

8. Failure to complete the above may result in the bid being declared non-responsive. The costs indicated herein are provided to comply with the Act and shall not constitute grounds for any additional compensation to that listed for the separate line items of the Bid Form.

\_\_\_\_\_  
(Contractor)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

STATE OF \_\_\_\_\_ COUNTY OF \_\_

PERSONALLY APPEARED BEFORE ME, the undersigned authority, \_\_\_\_\_ who, after first being sworn by me, affixed his/her signature in the space provided on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_

My Commission Expires:  
NOTARY PUBLIC

\_\_\_ Personally Known to Me or  
\_\_\_ Produced Identification Type of I.D. \_\_\_\_\_

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## **General Specification 002 – Definitions and General Statements**

### **1. Definitions**

Owner – Shall mean Highlands County BCC and its employees and operations AND the Istokpoga Marsh Water Improvement District and its members, employees and operations.

Contractor – Shall mean Owner’s designated State of Florida Licensed General Contractor.

Engineer – Shall mean Royal Consulting Services, Inc. the lead engineering firm for the project.

Subcontractor – Refers to the contractor directly under control and with whom the General Contractor has entered into a contractual agreement to perform work on behalf of the Owner.

Surveyor – Shall mean the State of Florida Registered Land Surveyor which is a subcontractor of the Contractor who will provide services for the project as outlined in Section CS007.

Geotech – Shall me the State of Florida Licensed Geotechnical Testing firm which is a subcontractor of the Contractor who will provide Quality Assurance testing as specified in various sections of these specifications.

### **2. General Statements**

The work to be done under this contract may be completed by multiple subcontractors working under the direct control of the Contractor. All communications and payments for work will be through the Contractor. Subcontractors should not contract the Engineer or Owner directly instead the Subcontractor should seek clarification from the Contractor and the Contractor should seek clarification from the Engineer.

Potential Subcontractors shall be required to meet the Contractor’s minimum standards for licensing and insurance coverage. Proof of compliance of this requirement will become part of the agreement between the two parties and must remain in good standing for the term of the work and warranty period.

The specifications herein shall become an integral part of the engineering design plans. Subcontractors shall familiarize themselves with the content and conditions of the design plans and specifications. If questions arise during the course of his work, the Subcontractor should seek clarification from the Contractor.

There is a potential for other contractors and workers to be performing work on or near the site under separate agreement for the Owner/Engineer. A brief list examples includes:

1. Electric utility company
2. General site ditch maintenance crews
3. Water quality testing lab personnel
4. Normal farm and ranch operations

### **3. Priority**

Detail drawings, call outs and general notes on the plan sheets shall have priority over statements or conditions in these specifications.

## **General Specification 005 – General Requirements**

### **1. Scope**

The work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all work included in this contract. The Summary of the Work is presented in General Specification 10.

The Contractor shall furnish all labor, superintendence, safety professional, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, and other means of construction necessary or proper for performing and completing the work. He shall obtain and pay for all required permits. He shall perform and complete the work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Engineer, and in strict accordance with the contract documents. The Contractor shall clean up the work and maintain it during and after construction, until accepted, and shall do all work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the work.

The cost of incidental work described in the General Specifications, for which there are no specific contract Items, shall be considered as part of the general cost of doing the work and shall be included in the prices for the various contract Items. No additional payment will be made thereof.

The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the work required by this contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials and equipment, prior approval of the Engineer not-with-standing.

### **2. Existing utilities**

The contract documents contain data relative to existing utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy. It is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition and extent of all such installations and structures as may be encountered and as may affect the construction operations.

The Contractor shall protect all utility installations and structures from damage during the course of the work. Access across any buried utility installation or structure shall be made only in such locations and by means approved by the Engineer. The Contractor shall so arrange his operations as to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing utilities damaged by the Contractor that are shown on the plans or have been located in the field by the utility shall be repaired by the Contractor, at his expense, as directed by the Engineer. No separate payment shall be made for such protection or repairs to public utility installations or structures.

Utility installations or structures owned or controlled by the Contractor, or others, that are shown on the Plans to be removed, relocated, replaced or rebuilt by the Contractor shall be considered as a part of the general cost of doing the work and shall be included in the prices bid for the various contract items. No separate payment shall be made therefor.

Where utility installations or structures owned or controlled by the Owner, or others, are encountered during the course of the work, and are not indicated on the plans or in the specifications, and when, in the opinion of the Engineer, removal, relocation, replacement or



rebuilding is necessary to complete the work under this contract, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided in the agreement.

The Contractor shall, at all times in performance of the work, employ approved methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage or destruction of utility installations and structures; and shall, at all times in the performance of the work, avoid unnecessary interference with, or interruption of, utility services, and shall cooperate fully with the Engineer thereof to that end.

All governmental utility departments and other companies of public utilities which may be affected by the work will be informed in writing by the Contractor within two weeks after the execution of the contract or contracts covering the work. Such notice will set out, in general, and direct attention to the responsibilities of the Contractor and other governmental utility departments and other companies of public utilities for such installations and structures as may be affected by the work and will be accompanied by one set of Plans and Specifications covering the work under such contract or contracts.

No foreseeable work shall interrupt utility service without prior approval and direct coordination with the utility company. A written proposal shall be provided to the utility company for approval a minimum of ninety-six hours before proposed work. The Contractor shall notify in writing all affected customers a minimum of forty-eight hours before the proposed work. The utility company shall maintain the ultimate authority to cease work and reinstate utility service at any time during shutdown if the approved scope of work is not strictly adhered to.

The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the Engineer.

### **3. Plans and specifications**

When obtaining data and information from the Plans, figures shall be used in preference to scaled dimensions, and large scale drawings in preference to small scale drawings.

When the Contractor has identified a conflict between the plans and specifications he should immediately notify the Engineer for clarification. In absence of such clarification, the engineering design plans shall have priority.

After the contract has been executed, the Contractor will be furnished with up to five sets of paper prints, the same size as the original drawings, of each sheet of the Plans, and up to five copies of the Specifications. Additional copies of the Plans and Specifications, when requested, will be furnished to the Contractor only at cost of reproduction and execution.

The Contractor shall furnish each of the Subcontractors, manufacturers, and material suppliers such copies of the contract documents as may be required for their work.

When, in the opinion of the Engineer, it becomes necessary to explain more fully the work to be done or to illustrate the work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the Engineer and up to five paper prints thereof will be given to the Contractor.

The Supplementary Drawings shall be binding upon the Contractor with the same force as the Plans. Where such Supplementary Drawings require either less or more than the estimated quantities of work, credit to the Contractor or compensation therefore to the Contractor shall be subject to the terms of the Agreement.

The Contractor shall verify all dimensions, quantities and details shown on the Plans, Supplementary Drawings, schedules, Specifications or other data received from the engineer, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the engineer, should such errors or omissions be discovered. All schedules are given for the convenience of the engineer and the Subcontractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the contract.

The Technical Specifications consist of four parts: General (GS), Construction (CS), Material (MS) and Electrical (ES). The General Specifications contain general requirements that govern the work. Construction and Material Specifications modify and supplement these by detailed requirements for the work and shall always govern whenever there appears to be a conflict. Electrical Specifications provide minimum standards and guidance for all electrical work which is part of the project.

All work called for in the Specifications applicable to this contract, but not shown on the Plans in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Plans or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the work, is required and shall be performed by the Contractor as though it were specifically delineated or described.

The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis. If clarification of the Engineer's intent is required the Contractor is encouraged to contact the Engineer directly on a timely basis as not to delay the work progress.

#### **4. Materials and equipment**

The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings shall be submitted to the Engineer for approval, as early as possible, to afford proper investigation and checking. Such approval must be obtained before Shop Drawings will be checked. No manufacturer will be approved for any materials to be furnished under this contract unless he shall be of good reputation and have a plant of ample capacity. He shall, upon the request of the engineer, be required to submit evidence that he has manufactured a similar product to the one specified and that it has been previously used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.

All transactions with the manufacturers or Subcontractors shall be through the Contractor, unless the Contractor requests, in writing and the engineer approves, that the manufacturer or Subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this contract.

Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.

The Contractor shall deliver materials in ample quantities to ensure the most speedy and uninterrupted progress of the work so as to complete the work within the allotted time. The Contractor shall also coordinate deliveries in order to avoid delay in, or impediment of, the progress of the work of any related Contractor.

The Contractor shall, unless otherwise stated in the contract documents, furnish with each type, kind or size of equipment, one complete set of suitably marked high grade special tools and appliances (unless they are commonly available mechanic's tools) that may be needed to adjust, operate, maintain or repair the equipment. Such tools and appliances shall be furnished in tool cases as approved by Engineer.

Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight and principal rating data. The supplier and manufacturer's contact information shall also be provided in the Operation and Maintenance manual for future reference.

The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the work and to handle all emergencies normally encountered in work of this character.

Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Plans, unless directed otherwise by the Engineer during installation. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

The Contractor shall furnish, install and protect all necessary anchor and attachment bolts and all other appurtenances needed for the installation of the devices included in the equipment specified. Anchor bolts shall be as approved by the Engineer and made of ample size and strength for the purpose intended. Substantial templates and working drawings for installation shall be furnished.

The Contractor shall, at his own expense, furnish all materials and labor for, and shall properly bed in non-shrink grout, each piece of equipment on its supporting base that rests on masonry foundations. Grout shall completely fill the space between the equipment base and the foundation.

The contract prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall assist the Contractor, when required, to install, adjust, test and place in operation the equipment in conformity with the contract documents. After the equipment is placed in permanent operation by the Owner, such engineer or superintendent shall make all adjustments and tests required by the engineer to prove that such equipment is proper and satisfactory operating condition, and shall instruct such personnel as may be designated by the engineer in the proper operation and maintenance of such equipment.

## **5. Inspection and testing**

Inspection and testing of materials will be performed by the Contractor or his suppliers and manufacturers as directed by the Engineer unless otherwise specified without additional cost to Owner.

For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests and the reports thereof shall be in such form as will facilitate checking to determine compliance with the contract documents. Three copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the

acceptance of any material or equipment.

If, in the making of any test of any material or equipment, it is ascertained by the Engineer that the material or equipment does not comply with the contract, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the Owner.

Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.

The Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have nor make any claim for damage that may occur to equipment prior to the time when the Owner formally takes over the operation thereof.

All inspection and testing of materials furnished under this contract will be performed by the Contractor or duly authorized inspection engineers or inspection bureaus.

The cost of shop and field tests of equipment and of certain other tests specifically called for in the contract documents shall be borne by the Contractor and such costs shall be deemed to be included in the contract price.

Materials and equipment submitted by the Contractor as the equivalent to those specifically named in the contract may be tested by the Engineer for compliance. The Contractor shall reimburse the Owner for the expenditures incurred in making such tests on materials and equipment that are rejected for non-compliance.

The Contractor shall give notice in writing to the Engineer, sufficiently in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Engineer will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials or he will notify the Contractor that the inspection will be made at a point other than the point of manufacture, or he will notify the Contractor that inspection will be waived. The Contractor must comply with these provisions before shipping any material. Such inspection shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the contract documents.

When inspection is waived or when the Engineer so requires, the Contractor shall furnish to him authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the contract documents. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer. The certificates shall be delivered to the Engineer prior to shipment of the materials.

Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the contract documents. No such equipment shall be shipped to the work site until the Engineer notifies the Contractor, in writing, that the results of such tests are acceptable.

Three copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company, shall be

forwarded to the Engineer for approval.

The cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Subcontractor.

As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make preliminary field tests of equipment. If the preliminary field tests disclose any equipment furnished under this contract that does not comply with the requirements of the contract documents, the Contractor shall, prior to the acceptance tests, make all changes, adjustments and replacements required. The Contractor shall assist in the preliminary field tests as applicable.

Upon completion of the work and prior to final payment, all equipment and piping installed under this contract shall be subjected to acceptance tests as specified or required to prove compliance with the contract documents.

The Contractor shall furnish labor, fuel, energy, water and all other materials, equipment and instruments necessary for all acceptance tests, at no additional cost to the Contractor. The Contractor shall assist in the final field tests as applicable.

Any defects in the materials and equipment or their failure to meet the tests, guarantees or requirements of the contract documents shall be promptly corrected by the Contractor by replacements or otherwise. The decision of the Engineer as to whether or not the Contractor has fulfilled his obligations under the contract shall be final and conclusive. If the Contractor fails to make these corrections or if the improved materials and equipment, when tested, shall again fail to meet the guarantees or specified requirements, the Engineer, notwithstanding its partial payment for work, and materials and equipment, may reject the materials and equipment and may order the Contractor to remove them from the site at his own expense.

If the failure during testing is fully or partly due to the equipment provided by the Contractor, as determined by the Engineer, the Contractor shall make all required improvements at no cost to the Owner.

In case the Engineer rejects any materials and equipment, then the Contractor shall replace the rejected materials and equipment within a reasonable time. If he fails to do so, the Engineer may, after the expiration of a period of thirty (30) calendar days after giving him notice in writing, proceed to replace such rejected materials and equipment, and the cost thereof shall be deducted from any compensation due or which may become due the Contractor under his contract.

The Contractor agrees to obtain other equipment within a reasonable time and the Engineer agrees that the Contractor may use the equipment furnished by him without rental or other charges until the new equipment is obtained.

During such final inspections, the work shall be clean and free from water. In no case will the final estimate be prepared until the Contractor has complied with all requirements set forth and the Engineer has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the contract documents.

## **6. Temporary structures**

If, during the course of the work, it is necessary to remove or disturb any fence or part thereof, the Contractor shall provide a suitable temporary fence at his own expenses, which shall be maintained until the permanent fence is replaced. The Engineer shall be solely responsible for the determination of the necessity for providing a temporary fence and the type of temporary fence to

be used.

In accepting the contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation and will indemnify and save harmless the Owner and Engineer from all claims, suits or actions and damages or costs of every description arising by reason of failure to comply with the above provisions.

## **7. Safety**

Precautions shall be exercised at all times for the protection of person and property. The safety provisions of applicable laws, building and construction codes shall be observed. The Contractor and all Subcontractors shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), and under Section 107 of the contract Work Hours and Safety Standards Act (PL 91-54), except where state and local safety standards exceed the federal requirements and except where state safety standards have been approved by the Secretary of Labor in accordance with provisions of the Occupational Safety and Health Act, shall be complied with.

The Contractor shall keep on-site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when men are employed on the work.

See HSE Requirements specification for additional information and requirements.

## **8. Lines and grades**

All work under this contract shall be constructed in accordance with the lines and grades shown on the Plans, or as given by the Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.

The Contractor shall use a Florida Licensed Certified Land Surveyor to establish bench marks and base line controlling points. Reference marks for lines and grades as the work progresses will be located to cause as little inconvenience to the prosecution of the work as possible. The Contractor shall so place excavation and other materials as to cause no inconvenience in the use of the reference marks provided. He shall remove any obstructions placed by him contrary to this provision.

The Contractor shall furnish and maintain, at his own expense, stakes and other such materials, and give such assistance, including qualified helpers, as may be required by the Engineer for setting reference marks. The Contractor shall check such reference marks by such means as he may deem necessary and, before using them, shall call the Engineer's attention to any inaccuracies. The Contractor shall, at his own expense, establish all working or construction lines and grades as required from the reference marks and shall be solely responsible for the accuracy thereof. He shall, however, be subject to the check and review of the Engineer. It is the intention not to delay the work for the establishment of reference marks but, when necessary, working operations shall be suspended for such reasonable time as the Engineer may require for this purpose.

The Contractor shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the work, bear the cost of reestablishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes and marks.

The Contractor shall safeguard all existing and known property corners, monument and marks adjacent to but not related to the work and, if required, shall bear the cost of reestablishing them if disturbed or destroyed.

All elevations indicated or specified refer to the North American Vertical Datum of 1988 (NAVD88).

## **9. Adjacent structures and landscaping**

The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the work, whether or not shown on the Plans, and the removal, relocation and reconstruction of such items called for on the Plans or specified shall be included in the various contract items and no separate payments will be made therefor.

The Contractor is expressly advised that the protection of buildings, structures, tunnels, tanks, pipelines, etc. and related work adjacent and in the vicinity of his operations, wherever they may be, is solely his responsibility. Conditional inspection of buildings or structures in the immediate vicinity of the project which may reasonably be expected to be affected by the work shall be performed by and be the responsibility of the Contractor.

The Contractor shall, before starting operations, make an examination of the interior and exterior of the adjacent structures, buildings, facilities, etc., and record by notes, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the Contractor and to the satisfaction of the Engineer. This does not preclude conforming to the requirements of the insurance underwriters. Copies of surveys, photographs, reports, etc., shall be given to the Engineer upon request.

Prior to the beginning of any excavations the Contractor shall advise the Engineer of all buildings or structures on which he intends to perform work or which performance of the project work will affect.

All trees and shrubs shall be adequately protected by the Contractor in accordance with ordinances governing the protection of trees. No excavated materials shall be placed so as to injure such trees or shrubs. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by him with new stock of similar size and age, at the proper season and at the sole expense of the Contractor. Beneath trees or other surface structures, where possible, pipelines may be built in short tunnels, backfilled with excavated materials, except as otherwise specified, or the trees or structures carefully supported and protected from damage. The Engineer may order the Contractor, for the convenience of the Engineer, to remove trees along the line or trench excavation. If so ordered the Engineer will obtain any permits required for removal of trees. Such tree removal ordered shall be paid for under the associated contract items.

Lawn areas shall be left in as good condition as before the starting of the work. Where sod is to be removed, it shall be carefully removed, and later replaced, or the area where sod has been removed shall be restored with new sod to a similar condition as before the starting of the work at the expense of the Contractor.

Any fence, or part thereof, that is damaged or removed during the course of the work shall be replaced or repaired by the Contractor and shall be left in as good a condition as before the starting of the work. The manner in which the fence is repaired or replaced and the materials used in such

work shall be subject to the approval of the Engineer. The cost of all labor, materials, equipment, and work for the replacement or repair of any fence shall be deemed included in the appropriate contract item or items, or if no specific Item is provided therefor, as part of the overhead cost of the work, and no additional payment will be made thereof.

#### **10. Protection of work and public**

During the prosecution of the work, the Contractor shall put up and maintain at all times such barriers and lights as will effectually prevent accidents and/or injury. Where appropriate, as determined by the Contractor, proper signs, warning devices, and flagmen shall be maintained as required by DOT Manual of Uniform Traffic Control and Safe Practices.

The Contractor shall use hard coal, coke, oil or gas as fuel for equipment generating steam. A strict compliance with ordinances regulating the production and emission of smoke will be required.

The Contractor shall eliminate noise to as great an extent as practicable at all times. Air compressing plants shall be equipped with silencers and the exhaust of all gasoline motors or other power equipment shall be provided with mufflers. In the vicinity of hospitals and schools, special care shall be used to avoid noise or other nuisances. The Contractor shall strictly observe all local regulations and ordinances covering noise control.

Neither the materials excavated nor the materials or plant used in the construction of the work shall be so placed as to prevent free access to all fire hydrants, valves or manholes.

The Contractor shall prevent dust nuisance from his operations or from traffic by keeping the roads and/or construction areas sprinkled with water at all times.

#### **11. Cutting and patching**

The Contractor shall do all cutting, fitting or patching of his portion of the work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the Engineer and in accordance with the Plans and Specifications. The work must be done by competent workmen skilled in the trade required by the restoration.

#### **12. Cleaning**

During construction of the work, the Contractor shall, at all times, keep the site of the work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the Engineer, such material, debris, or rubbish constitutes a nuisance or is objectionable.

The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops. Contractor shall be responsible and liable for all spillage and incur all associated costs including, but not limited to, costs related to repair and maintenance resulting from damages thereof.

At the conclusion of the work, all erection plant, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.

The Contractor shall thoroughly clean all equipment and materials installed by him and shall deliver such materials and equipment undamaged in a bright, clean, polished and new operating condition.

#### **13. Miscellaneous**

The Contractor will be responsible for filing a Storm Water Pollution Prevention (SWPP) plan. The



Contractor for abiding by all applicable terms of the SWPP plan and implementing relevant components related to their scope of work. The Contractor will monitor and report adherence to the SWPP plan.

The Contractor shall arrange his operations to minimize siltation and bank erosion on construction sites and on existing or proposed water courses and drainage ditches. The Contractor, at his own expense, shall remove any siltation deposits and correct any erosion problems as directed by the Engineer which results from his construction operations.

The Contractor shall properly dispose of all surplus material, including spoil, in accordance with Local, State, and Federal regulations. Under no circumstances shall surplus material be disposed of in wetland areas as defined by the Florida Department of Environmental Protection.

The work shall be so conducted to maintain existing facilities in operation. Requirements and schedules of operations for maintaining existing facilities in service during construction shall be as described in these Specifications.

All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions. All chemicals and flammables will be in approved containers and labeled appropriately. All work to be in compliance with 29CFR 1926 Subpart D OSHA standards.

During progress of work under this contract, it may be necessary for other contractors and persons employed by the Owner to work in or about the site. The company reserves the right to put such other contractors and persons to work and to afford such access to the site of the work to be performed hereunder at such times as the company deems proper. The Contractor shall not impede or interfere with the work of such other contractors and persons engaged in or about the work and shall so arrange and conduct his work that such other contractors and persons may complete their work at the earliest date possible.

## **General Specification 010 – Summary of Work**

### **1. Scope**

Furnish all labor, materials, equipment and incidentals required to construct an above ground impoundment and pump station for stormwater reuse as shown on the engineering design plans in its entirety and as detailed in these specifications.

The work includes, but is not necessarily limited to, the following:

1. Surveying necessary to:
  - a. Work with the Contractor to develop a Quality Assurance Plan for the project which will be submitted to the Engineer for review and approval before work begins.
  - b. Establish lines, grades, and elevations for project components
  - c. Measurements and calculations to certify to the Engineer the job progress
  - d. Record plans and final certification.
2. Geotechnical services to:
  - a. Work with the Contractor to develop a Quality Assurance Plan for the project which will be submitted to the Engineer for review and approval before work begins.
  - b. Classify soils and establish their suitability for construction
  - c. Complete progress compaction tests and submit required reports to the Engineer on a timely basis
  - d. Remain on-site during critical infrastructure installation and to submit report to the Engineer.
3. Installing and maintaining erosion controls throughout the project duration.
4. Creation and maintenance of a safety plan for the project.
5. Clearing and/or grubbing of project site areas upon which project components are to be constructed.
6. Removal of existing fences and gates where specified on the plans.
7. Erection of temporary fences to limit access and for animal control.
8. Removing and burning of trees and vegetation identified on drawings or as required to complete work (See CS002).
9. Removing existing culverts and structures as required by drawings.
10. Removal and disposal of unsuitable and excess soil.
11. Ditch covering as specified on the plans.
12. Excavation, hauling, placement and compaction of earthfill for impoundment construction.
13. Excavation, hauling, placement and compaction of earthfill for the access roads.
14. Excavation of new water supply canal and connecting culverts.
15. Installation of culverts under Channel A.
16. Installation of precast concrete structures for sluice gate, pumps and emergency overflow.

17. Installation of one drainage pump station with two (2) pumps.
18. Installation of electric rack, motor controls and level sensors.
19. Installation of seepage control ditch.
20. Installation of various water control structures and culverts as shown on plans.
21. Establish sod and hydroseed for site stabilization
22. Site cleanup.
23. Demobilization.
24. Testing and training of Owner's personnel.
25. Preparation of Operation and Maintenance Manual(s) and Construction As-Built Drawings.

## **2. Location of Work**

All of the work of this contract is on the site the IMWID Impoundment Phase II project in Highlands County, Florida as shown in the engineering design plans.

## **General Specification 020 – Project Coordination**

### **1. Work quality and progress**

The Subcontractor shall furnish personnel and equipment that will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress that will ensure the completion of the work within the time stipulated. If at any time such personnel appears to the Engineer to be inefficient, inappropriate or insufficient for securing the quality of work required, or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or increase the personnel and equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress.

### **2. Private land**

The Contractor shall not enter or occupy private land outside of easements, except by the written permission of the appropriate land owner and express authorization of the Engineer.

### **3. Pipeline and utility locations**

Pipelines and utilities shall be located substantially as indicated on the Drawings, but the engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures, or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

### **4. Open excavations**

All excavation activities will be in compliance with OSHA 29 CFR 1926 Subpart P. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by workmen.

### **5. Maintenance of traffic within road right-of-ways**

Unless permission is received in writing from the proper authority, two-way traffic shall be maintained at all times.

Where appropriate, as determined by the engineer, proper signs, warning devices, and flagmen shall be maintained as required by Department of Transportation Manual of Uniform Traffic Control and Safe Practices.

The Contractor shall take precautions to prevent injury to the public as a result of open trenches. All trenches opened during the day shall be closed at the end of the workday, and excavated material shall not be placed on traveled road surfaces, even temporarily.

### **6. Care and protection of property**

The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in another manner acceptable to the Engineer.

## **7. Operation within this contract**

All firms or persons authorized to perform any work under this Contract shall cooperate with the Contractor (and his subcontractors or trades), and shall assist in incorporating the work of other Subcontractors where necessary or required.

Cutting and patching, drilling and fitting shall be carried out where required by the trade or contractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

## **8. Protection of construction and equipment**

All newly constructed work shall be carefully protected from injury in any way. No wheeling or walking or placing of heavy loads on it shall be allowed and all portions injured shall be reconstructed by the Contractor at his own expense.

All work items shall be protected in a manner approved by the Engineer. Should any work items become heaved, cracked, eroded or otherwise damaged, all such damaged portions of the work shall be completely repaired and made good by the Contractor at his own expense and to the satisfaction of the Engineer. If, in the final inspection of the work, any defects, faults or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein, for the guarantee period described in the contract.

## **General Specification 025 – Special Provisions**

### **1. Installation of equipment**

Special care shall be taken to ensure proper alignment of all equipment with particular reference to pumps and electric drives. Units shall be carefully aligned on their foundations by qualified millwrights after their sole plates have been shimmed to true alignment at the anchor bolts. Anchor bolts shall be set in place and nuts tightened against the shims. Alignment of equipment shall be further checked after securing to the foundations, and after conformation of all alignments, the sole plates shall be finally grouted in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping, and under no circumstances will tension in the components caused by misalignment be allowed.

All wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure apparatus in place shall be furnished by the Contractor. All parts intended to be plumb or level must be proven exactly so. Perform all grinding necessary to bring parts to proper bearing after erection at the Contractor's expense.

### **2. Shop drawings**

The Engineer understands that some components or facilities specified on the design plans or are required to complete this project will vary slightly from those specified in areas such as dimension, mounting details, and installation methods. The Contractor is responsible to coordinate his work with the suppliers and manufacturers selected to provide a completed installation which will meet the goals of the project. To ensure that the materials proposed will be acceptable to the Engineer the Contractor shall submit shop drawings, performance data and supporting documents for approval to the Engineer prior to committing financially to the purchase of the items. The Engineer will make every effort to provide comments and written approval/rejection in a timely manner but not exceeding 30 days from the submittal being completed. Shop drawings shall include material specifications, mounting details and corrosion protection information. For this project shop drawings are required for at least the following items:

1. Drainage pumps, motors, drives, flap gates and related equipment
2. Sluice gate and operator
3. Hand rails and catwalk for pump station & sluice gate
4. Precast concrete components for (2) pump sumps, (1) sluice gate
5. Electric rack, wiring plan and conduit sizes (by electrician)
6. Motor controls (by selected automation company)
7. PLC logic program (by selected automation company)
8. Level sensors with mounting details – (2) analog, (2) level switched (by selected automation company)
9. Aluminum flash board risers and associated catwalks and hand rails
10. Any changes proposed by the Contractor
11. It is not necessary to submit shop drawings for straight HDPE culverts or aluminum culverts.
- 12.

### **3. Sleeves and openings**

The Contractor shall provide all openings, channels, chases, etc., in new construction and furnish and install anchor bolts and other items to be embedded in concrete, as required to complete the work under this contract. The Contractor shall do all cutting, coring and rough and finish patching required in existing construction for the work of all trades.

Contractors shall furnish all sleeves, inserts, hangers, anchor bolts, etc., required for the execution of their work. It shall be their responsibility before the work of the Contractor is begun to furnish him with the above items and with templates, drawings or written information covering chases, openings, etc., which they require, and to follow up the work of the Contractor as it progresses, making sure that their drawings and written instructions are carried out. Failing to do this, they shall be responsible for the cost of any corrective measures that may be required to provide necessary openings, etc. If the Contractor fails to carry out the directions given him, covering details and locations of openings, etc., he shall be responsible for any cutting and refinishing required to make the necessary corrections. In no case shall beams, lintels, or other structural members be cut without the approval of the Engineer.

### **4. Noise limitations**

All equipment to be furnished under this contract, unless specified otherwise in the technical specifications, shall be designed to ensure that the sound pressure level does not exceed 85 decibels over a frequency range of 37.8 to 9,600 cycles per second at a distance of three feet from any portion of the equipment, under any load condition, when tested using standard equipment and methods. Noise levels shall include the noise from the motor. Mufflers or external baffles shall not be acceptable for the purpose of reducing noise. Data on noise levels shall be included with the shop drawing submittal.

### **5. Obstructions**

The attention of the Contractor is drawn to the fact that during excavation at the Project site, the possibility exists of the Contractor encountering various water, chemical, electrical, or other lines not shown on the Drawings. The Contractor shall exercise extreme care before and during excavation to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, the Contractor shall repair the line at no cost to the Owner.

It is the responsibility of the Contractor to ensure that all utility or other poles, the stability of which may be endangered by the close proximity of excavation, are temporarily stayed in position while work proceeds in the vicinity of the pole and that the utility or other companies concerned be given reasonable advance notice of any such excavation by the Contractor.

### **6. Utility crossings**

It is intended that wherever existing utilities such as water, chemical, electrical or other service lines must be crossed, deflection of the pipe within recommended limits and cover shall be used to satisfactorily clear the obstruction unless otherwise indicated on the Drawings. However, when in the opinion of the Contractor or Engineer this procedure is not feasible he may direct the use of fittings for a utility crossing as detailed on the Drawings.

### **7. Connections to existing systems**

The Contractor shall perform all work necessary to locate, excavate and prepare for connections to existing utilities as shown on the Drawings or where directed by the Contractor. The cost for this

work and for the actual connection to existing utilities shall be included in the bid for the project and shall not result in any additional cost to the Contractor.

It is the responsibility of the Contractor to expose existing pipelines at the tie-in locations and, if necessary, any buried utilities in the immediate area of the tie-in that may affect the installation of new pipe as shown on the Drawings. The Contractor is fully responsible for ordering any additional material, such as fittings and restrained pipe that may be needed to avoid existing buried utilities should such material not be shown on the Drawings or included in the Contractor's Schedule of Prices. The Contractor may not schedule any tie-in activity until such additional material is on-site.

#### **8. Provisions for erosion control**

Sufficient precautions shall be taken during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other polluting materials harmful to humans, fish, or other life, into the supplies and Surface Waters of the State. Control measures must be adequate to assure that turbidity in the receiving water will not be increased more than 10 nephelometric turbidity units (NTU), or as otherwise required by the State or other controlling body, in water used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 29 NTU unless otherwise permitted (See CS005). Special precautions shall be taken in the use of construction equipment to prevent operations that promote erosion. Contractor shall reference Florida Stormwater, Erosion and Sedimentation Control Inspection manual.

#### **9. Provisions for dust and litter control**

Sufficient precautions to prevent nuisance to adjacent property owners and the general public shall be taken during construction (including clearing and grubbing) to minimize the amount of dust created. Wetting down the site may be required or as directed by the Engineer to prevent dust as a result of vehicular traffic. Control of blowing litter caused by any re-grading by the Contractor shall be the responsibility of the Contractor. The Contractor shall use dust control methods and materials approved by the Engineer.

#### **10. Damage caused by high water**

Contractor will hold himself responsible for all damage done to his work by heavy rains or floods and he shall take all reasonable precautions to provide against damages by building such temporary dikes, channels, or shoring to carry off storm water as the nature of the work may require.

#### **11. Emergency phone numbers and accident reports**

Emergency phone numbers (fire, medical, police) shall be posted at the job site or in a location approved by Owner/Engineer and its locations be made to known to all workers.

Accidents shall be reported immediately to the Owner/Engineer by messenger or phone.

All accidents shall be documented by the Contractor and a fully detailed written report submitted by the Contractor to the Owner/Engineer after each accident.

#### **12. Items specified on drawings**

Items of material, equipment, machinery and the like may be specified on the drawings and not in the specifications. The Contractor shall provide such items in accordance with the specification on the drawings.



### **13. Salvage**

Any existing equipment or material, including but not limited to culverts, water control structures, fences, gates, etc., which is removed or replaced as a result of construction under this project may be designated as salvage by the Engineer and if so shall be excavated, if necessary, and shall be cleaned and stored on or adjacent to the site in a protected place specified by the Engineer or loaded onto trucks provided by the Owner. Any equipment or material not worthy of salvaging, as directed by the Engineer, shall be disposed at a suitable off-site location by the Contractor at the Contractor's expense.

### **14. Workmanship, materials, and equipment**

When a particular product is specified or called for, it is intended and shall be understood that the proposal tendered by the Contractor included those products in his bid. Should the Contractor desire equal to those specified, the Contractor shall furnish information as described in the Standard General Conditions. The alternate product or products submitted by the Contractor shall meet the requirements of the specifications and shall, in all respects, be equal to the products specified by name herein.

All apparatus, mechanism, equipment, machinery and manufactured articles for incorporation into the work shall be the new and unused standard products of recognized reputable Manufacturers.

### **15. Services of manufacturer's field service technician**

As directed by the Engineer, bid prices of equipment furnished shall include the cost of a competent field service technician of the manufacturers of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance. The approved Manufacturer's operation and maintenance data as specified elsewhere herein shall be delivered to the Engineer prior to instructing the Owner's personnel. This supervision may be divided into two or more time periods as required by the installation program or as directed by the Engineer.

After installation of the equipment has been completed and the equipment is presumably ready for operation, but before it is operated by others, the Manufacturer's field service technician shall inspect, operate, test and adjust the equipment. The inspection shall include at least the following points where applicable:

1. Soundness (without cracked or otherwise damaged parts).
2. Completeness in all details, as specified and required.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.
5. Calibration and adjustment of all related instrumentation and controls.
6. Energize equipment.
7. Deficiency correction
8. Demonstration of compliance with application performance specification.

The operation, testing, and adjustment shall be as required to prove that the equipment has been left in proper condition for satisfactory operation under the conditions specified.

Upon completion of this work, the Manufacturer's field service technician shall submit, in duplicate, to the Engineer a complete, signed report of the results of his inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance.

Each equipment Manufacturer shall provide instruction to the Owner's operating personnel. Training shall not be performed until the above requirements have been fully satisfied and any specified performance testing completed. Duration of training shall be sufficient to completely familiarize Owner's operating personnel which may require multiple training sessions. Training time and date shall be provided when convenient of the proposed operators of the equipment. Training shall not be concurrent with on-going testing debugging or installation activities; but shall be a separate activity devoted exclusively to the instruction of the Owner's personnel in the operation and maintenance of the Manufacturer's equipment. Training shall be performed by qualified representatives of each equipment Manufacturer specifically skilled in providing instruction to operation personnel. Training shall provide an overview of operations and maintenance requirements and shall include but not be limited to:

1. Description of unit and component parts.
2. Operating capabilities and performance criteria.
3. Operating procedures.
4. Maintenance procedures
5. Servicing and lubrication schedules.
6. Troubleshooting.

A certificate from the Manufacturer stating that the installation of the equipment is satisfactory, that the unit has been satisfactorily tested, is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication, and care of the unit shall be submitted before start-up and acceptance by the Engineer. The certificate shall indicate date and time instruction was given and names of operating personnel in attendance. This certification shall be submitted on the certification sheet, the form of which is at the end of this section.

See the detailed Specifications for additional requirements for furnishing the services of the Manufacturer's field service technician.

For equipment furnished under other specifications, the Contractor, unless otherwise specified, shall furnish the services of accredited field services technicians of the Manufacturer only when some evident malfunction or over-heating makes such services necessary in the opinion of the Engineer.

## **16. Operation and maintenance data**

Operating and maintenance data covering all equipment furnished shall be delivered directly to the Engineer, for approval within 60 days of installation and before final acceptance. No payment shall be made for equipment installed or stored on-site until the Engineer has approved the adequacy and completeness of the operating and maintenance data. Final approved copies of operating and maintenance data shall have been delivered to the Engineer on Owner's behalf two weeks prior to scheduling the instruction period with the Owner.

## **17. Responsibility of Contractor**

The Contractor shall be responsible for the entire work determined by the Drawings, Specifications and contract from the date of the starting of the work until it is accepted as evidence of approval of the Completion Certificate by the Contractor. He shall be responsible for removals, renewals and replacements due to action of the elements and all other causes except as otherwise provided in the Specifications. The Contractor shall keep the contract under his own control and it shall be his responsibility to see that the work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally or shall have a competent, English speaking superintendent or representative, who shall be on the site of the project at all working hours, and who shall be given full authority by the Contractor to direct the performance of the work and make arrangement for all necessary materials, equipment and labor without delay.

Renewals or repairs necessitated because of defective materials or workmanship, or due to action of the elements or other natural causes, including weather events, fire and flood, prior to the acceptance as determined by the Completion Certificate, shall be done anew in accordance with the contract and Specifications at the expense of the Contractor.

## **18. Construction conditions and subsurface investigation**

The Contractor shall strictly adhere to the specific requirements of the governmental unit(s) or agency(ies) having jurisdiction over the work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

The Contractor shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater conditions, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions and all other matters which can in any way affect the work under this contract. The prices established for the work to be done will reflect all costs pertaining to the work. Any claims for extras based on substrata, groundwater table, and other such conditions will not be allowed.

## **19. Suspension of work because of weather**

During inclement weather, Contractor shall halt all work that might be damaged or rendered inferior by such weather conditions. The Engineer may also give orders to suspend work if he has made a determination that the quality of work is being compromised due to weather and his decision shall be final and binding. The ability for the Engineer to issue such an order shall not be interpreted as a requirement to do so. During suspension of the work from any cause, the work shall be suitably covered and protected so as to preserve it from injury by the weather or otherwise; and, if the Engineer shall so direct, the rubbish and surplus materials shall be removed.

In the event of inclement weather, the Contractor shall protect the work and materials from damage or injury from the weather. If, in the opinion of the Engineer, any portion of the work or materials has been damaged, such work and materials shall be removed and replaced with new materials and work to the satisfaction of the Engineer at the expense of the Contractor. In any case to cost to repair damages to work due to weather shall be born completely by Contractor and at no expense to Owner.

## **20. Permits**

Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Engineer to do the work from the appropriate governmental agency or agencies. No work shall commence until all applicable permits have been obtained and copies delivered to the Engineer. The costs for obtaining all permits shall be borne by the Contractor.

## **21. Pumping**

The Contractor with equipment provided by him shall do all pumping necessary to complete and protect the work as shown on the design plans during the entire construction and acceptance period of the contract. If temporary bypass of existing water ways is planned to be implemented by pumping it will also be the responsibility of the Contractor.

## **22. Owner occupancy and operation of completed facilities**

It is assumed that portions of the work will be completed prior to completion of the entire work. Upon completion of construction in each individual facility, including testing, if the Engineer, at his sole discretion, desires to accept the individual facility, the Contractor will be issued a dated certificate of completion and acceptance for each individual facility. The Owner will assume ownership and begin operation of the individual facility on that date and the one year guarantee period shall commence on that date. The Owner has the option of not accepting any individual completed facility, but accepting the entire work as a whole when it is completed and tested.

## **23. Claims for property damage**

Upon notification by the Owner/Engineer, the Contractor shall investigate each claim for property damage and shall file, within ten (10) days of such notification, a statement with Owner/Engineer setting forth all facts and details relative to such claim.

## **24. Existing underground piping, structures, and utilities**

The locations of existing underground utilities are from information obtained from the respective utility companies. The locations are shown without express or implied representation, assurance, or guarantee that they are complete or correct or that they represent a true picture of underground piping to be encountered.

## **25. Coordination of work**

The Contractor shall afford other contractors and subcontractors, if any, reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the work with such other work. The Contractor shall coordinate his work with other contractors and subcontractors to store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of the work or the work of any others.

If the execution or result of any part of the work depends upon any work of any separate contractor or utility, the Contractor shall, prior to proceeding with the work, inspect and promptly report to the Owner/Engineer in writing any apparent discrepancies or defects in such work of any separate contractor or utility that render it unsuitable for the proper execution or result of any part of the work.

Failure of the Contractor to so inspect and report discrepancies or defects shall constitute an acceptance of the separate contractor's or utility's work as fit and proper to receive the work, except

as to defects which may develop in the separate contractor's work after completion of the work and which the Contractor could not have discovered by its inspection prior to completion of the work.

Should the Contractor cause damage to the work of separate contractors or the Owner's property, or to other work on the Site, or delay or interfere with other contractor's work on ongoing operations or facilities or adjacent facilities or said separate contractor's work, the Contractor shall be liable for the same; and, in the case of another contractor, the Contractor shall attempt to settle said claim with such other contractor prior to such other contractor's institution of litigation or other proceedings against the Contractor.

If such separate contractor sues the Engineer/Owner because of any damage, delay or interference caused or alleged to have been so caused by the Contractor, the Engineer/Owner shall notify the Contractor, who shall defend the Engineer/Owner in such proceedings at the Contractor's expense. If any judgment or award is entered against the Owner, the Contractor shall satisfy the same and shall reimburse the Engineer/Owner for all damages, expenses, attorney's fees and other costs that the Engineer/Owner incurs as a result thereof.

Should a separate contractor cause damage to the work or to the property of the Contractor or cause delay or interference with the Contractor's performance of the work, the Contractor shall present directly to said separate contractor any claims it may have as a result of such damage, delay or interference (with an information copy to the Contractor) and shall attempt to settle its claim against said separate contractor prior to the institution of litigation or other proceedings against said separate contractor.

In no event shall the Contractor seek to recover from the Owner or the Engineer, and the Contractor hereby represents to the Owner and the Engineer that it will not seek to recover from them, or either of them, any costs, expenses, (including, but not limited to, attorney's fees) or losses of profit incurred by the Contractor as a result of any damage to the work or property of the Contractor or any delay or interference caused or allegedly caused by any separate contractor.

Any difference or conflict which may arise between the Contractor and other contractors who may be performing work on behalf of the Owner or between the Contractor and workmen of the Contractor in regard to their work shall be adjusted and determined by the Engineer. If the work of the Contractor is delayed because of any acts of omissions of any other contractor of the Contractor, the Contractor shall on that account have no claim against the Owner other than for an extension of time.

## **26. Final guarantee**

All work shall be guaranteed by the Contractor for a period of one year from and after the date of substantial completion.

If, within the guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Engineer, is rendered necessary as the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the contract, the Contractor shall, promptly upon receipt of notice from the Contractor and without expense to the Contractor, do the following:

1. Place in satisfactory condition in every particular all of such guaranteed work and correct all defects therein.
2. Make good all damage to the facility, site, equipment, piping or contents thereof, which, in the opinion of the Engineer, is the result of the use of materials, equipment or

workmanship which are inferior, defective, or not in accordance with the terms of the contract.

3. Make good any work or material, or the equipment and contents of building, structure or site disturbed in fulfilling any such guarantee.

If the Contractor, after notice, fails within ten days to proceed to comply with the terms of this guarantee, the Owner may have the defects corrected, and the Contractor and his surety shall be liable for all expense incurred, provided, however, that in case of an emergency where, in the opinion of the Owner, delay would cause loss or damage, repairs may be started without notice being given to the Contractor and the Contractor shall pay the cost thereof.

All special guarantees or warranties applicable to specific parts of the work as may be stipulated in the contract Specifications or other papers forming a part of this contract shall be subject to the terms of this paragraph during the first year of life of each such guarantee. All special guarantees and Manufacturers' warranties shall be assembled by the Contractor and delivered to the Engineer, along with a summary list thereof, before the acceptance of the work.

### **27. Automatically controlled equipment**

Whenever automatically controlled equipment is required to be operated under the contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for a period of 48 hours, or another period approved by the Engineer, following the breakdown or malfunction, provided this method of operation is safe, will not damage the equipment and will produce results otherwise meeting specifications.

### **28. Equipment data forms**

Obtain, prepare, and submit a complete, detailed listing of equipment and motor data for all electrical items furnished under this contract. This listing shall be submitted with the preliminary draft of Operations and Maintenance Data Manuals on Equipment Data sheets, Equipment Manufacturer's Certificate of Installation, Testing and Instruction, and Warranty for Equipment Item forms, samples of which are at the end of this section.

### **29. Rights in and use of materials found on the work site**

The Contractor, with the approval of the Engineer, may use on the project such stone, gravel, sand, or other material determined suitable by the Engineer, as may be found in the excavation and will be paid both for the excavation of such materials at the corresponding contract unit price and for the pay item for which the excavated material is used. He shall replace at his own expense with other acceptable material all of that portion of the excavation materials so removed and used which was needed for use in the embankments, backfills, approaches, or otherwise. No charge for the materials so used will be made against the Owner.

## General Specification 025A – Special Provisions, HSE Requirements

### 1. Scope

The Owner requires a safe environment for all employees and subcontractors on the project. Construction project safety is the highest priority and breaches of safety protocols is not acceptable. Therefore, each contractor working on the site shall provide a comprehensive health, safety, and environment (HSE) plan and show proof by supporting documents that every employee in their offices has satisfactorily completed their company safety training program.

### 2. Qualifications

All HSE plans shall meet at least the minimum Occupational Safety and Health Administration (OSHA) standards. Standards can be found online at <http://www.osha.gov>. HSE plan must also meet any local, state or other federal government standards.

### 3. Submittals

**Submittals made with bid** shall include the bidding Owner's HSE plan along with any subcontractor's HSE plan. Electronic submission is allowed. All subcontractors shall sign at the bottom of the page verifying that the Subcontractor has read and understands the HSE procedures.

### 4. Basis of acceptance

The acceptability of the HSE plan shall be determined by inspections to check compliance with the provisions of this standard with respect to all standards required. Contractor will then provide all HSE certificates for employees before work starts and shall maintain a file onsite at all times.

### 5. Safety Manager

Contractor will be required to have a designated, qualified Site Safety Manager on site at all times work is being performed whose primary duty will be to oversee all aspects of the site HSE program for the Contractor and any Subcontractors and will be the principle interface for concerning safety matters.

Print: \_\_\_\_\_

Title: \_\_\_\_\_

Sign: \_\_\_\_\_

Date: \_\_\_\_\_

## **Construction Specification 002—Clearing and Grubbing**

### **1. Scope**

The work consists of clearing, grubbing, and disposing of trees, snags, logs, brush, stumps, shrubs, grass and other vegetation from the designated areas.

### **2. Protection of existing vegetation**

Trees and other vegetation designated to remain undisturbed shall be protected from damage throughout the duration of the construction period. The Contractor shall repair any damages resulting from the Contractor's operations or neglect.

Earthfill, stockpiling of materials, vehicular parking, and excessive foot or vehicular traffic shall not be allowed within the drip line of vegetation designated to remain in place. Vegetation damaged by any of these or similar actions shall be replaced with viable vegetation of the same species, similar condition, and like size, unless otherwise approved by the Engineer.

Any cuts, skins, scrapes, or bruises to the bark of the vegetation shall be carefully trimmed and local nursery accepted procedures used to seal damaged bark.

Any limbs or branches 0.5 inches or larger in diameter that are broken, severed, or otherwise seriously damaged during construction shall be cut at the base of the damaged limb or branch, flush with the adjacent limb or tree trunk. All roots 1-inch or larger in diameter that are cut, broken, or otherwise severed during construction operations shall have the end smoothly cut perpendicular to the root. Roots exposed during excavation or other operations shall be covered with moist earth or backfilled as soon as possible to prevent the roots from drying.

### **3. Marking**

In general, all trees, shrubs, or bushes that lie within the boundary of the project site shall be removed in the most efficient manner possible. Any specific trees, shrubs, or bushes that are to remain will be clearly marked by the Engineer for preservation.

### **4. Clearing and grubbing**

All trees not marked for preservation and all snags, logs, brush, stumps, shrubs, rubbish, and similar materials shall be cleared from within the limits of the designated areas. Unless otherwise specified, all stumps, roots, and root clusters that have a diameter of 1 inch or larger shall be grubbed out to a depth of at least 2 feet below subgrade for concrete structures and 1 foot below the ground surface at embankment sites and other designated areas.

Trees and shrubs located on or near the banks of existing ditches, which are to remain in the final drainage plan and might damage the banks if removed, shall be removed by a mechanical grinder to 6" below ground and treated with an herbicide that has been approved by the Engineer. If any repeated treatments are necessary to provide 100% control, the Contractor shall provide the extra treatments as an option.

### **5. Disposal**

All materials cleared and grubbed from the designated areas shall be disposed at locations approved by the Engineer. Burning of any cleared material shall be coordinated by the Contractor and permitted by the proper local authorities. All necessary equipment and procedures shall be supplied by the Contractor. The Contractor is responsible for complying with all local rules and regulations



and the payment of any and all fees that may result from disposal at locations away from the project site.

## **6. Measurement and payment**

Compensation for any item of work described in the contract, but not listed in the bid schedule, will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 7.

All payments to contractors will be made in accordance to the terms of the contract between the Owner and the Contractor.

## **7. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details are:

### Work Items: Clearing

- (1) Removal of exotic vegetation in approximately 8000' of existing ditches which will be improved to supply water to the pump station and impoundment.
- (2) Removal of exotic vegetation in approximately 850' of existing ditch to connect proposed relocated pump to the proposed water supply ditch.
- (3) Removal of exotic vegetation in approximately 2500' of existing ditch and fence line on the west side of the impoundment property.
- (4) Removal of scattered exotic vegetation in the northwest corner of the impoundment as needed for construction of the pump station, pump sump, roads and dike.
- (5) The impoundment property site has very few trees or bushes and the Engineer does not require for any to be cleared unless they present a obstruction to the completion of the proposed earthwork.
- (6) Clearing shall be restricted to the area within the limits of work. All other areas shall be left undisturbed.
- (7) All clearing shall be accomplished in such a manner as to minimize air and water pollution. Contractor should leave waterways that are adjacent to the clearing activities in the same condition as before the Contractor commenced work.
- (8) Some disturbance of the existing site work is expected and will need to be repaired. However, the Contractor must make every effort to minimize this disturbance and communicate his concerns with the Engineer if any of the clearing activities is likely to cause substantial damage.
- (9) All cleared materials shall become the property and responsibility of the Contractor and shall be disposed of by the Contractor.

### Work Items: Grubbing

- (1) This item shall consist of the removal of vegetation and unsuitable soils from the areas under the proposed dikes, berms, slabs, and structures.
- (2) Grubbing shall be restricted to the area within the limits of work. All other areas shall be left undisturbed.

- (3) All grubbing shall be accomplished in such a manner as to minimize air and water pollution.
- (4) All grubbed materials shall become the property and responsibility of the Contractor and shall be disposed of by the Contractor.

Work Items: Ditch Cleaning

- (1) This item shall remove debris and silt from existing ditches as indicated on the plans.
- (2) Ditch cleaning will be performed after exotic vegetation has been removed.
- (3) Ditch cleaning shall be completed in accordance with the Florida Department of Agriculture and Consumer Services publication "Water Quality Best Management Practices for Florida Cow/Calf Operations", Section 5.0 Water Resources Management.

## **Construction Specification 005—Pollution Control**

### **1. Scope**

The work consists of installing measures or performing work to control erosion and minimize the production of sediment and other pollutants to water and air from construction activities.

### **2. Material**

All material furnished shall meet the requirements of the material specifications listed in section 8 of this specification.

### **3. Erosion and sediment control measures and works**

The measures and works shall include, but are not limited to, the following:

***Staging of earthwork activities***—The excavation and moving of soil materials shall be scheduled to minimize the size of areas disturbed and unprotected from erosion for the shortest reasonable time.

***Seeding***—Seeding to protect disturbed areas shall occur as soon as reasonably possible following completion of that earthwork activity.

***Mulching***—Mulching to provide temporary protection of the soil surface from erosion.

***Diversions***—Diversions to divert water from work areas and to collect water from work areas for treatment and safe disposition. They are temporary and shall be removed and the area restored to its near original condition when the diversions are no longer required or when permanent measures are installed.

***Stream crossings***—Culverts or bridges where equipment must cross streams. They are temporary and shall be removed and the area restored to its near original condition when the crossings are no longer required or when permanent measures are installed.

***Sediment basins***—Sediment basins collect, settle, and eliminate sediment from eroding areas from impacting properties and streams below the construction site(s). These basins are temporary and shall be removed and the area restored to its original condition when they are no longer required or when permanent measures are installed.

***Sediment filters***—Straw bale filters or geotextile sediment fences trap sediment from areas of limited runoff. Sediment filters shall be properly anchored to prevent erosion under or around them. These filters are temporary and shall be removed and the area restored to its original condition when they are no longer required or when permanent measures are installed.

***Waterways***—Waterways for the safe disposal of runoff from fields, diversions, and other structures or measures. These works are temporary and shall be removed and the area restored to its original condition when they are no longer required or when permanent measures are installed.

***Other***—Additional protection measures as specified in section 8 of this specification or required by Federal, State, or local government. Contractor shall reference Florida Stormwater Erosion and Sedimentation Control Inspector's Manual.

### **4. Chemical pollution**

The Contractor shall provide watertight tanks or barrels or construct a sump sealed with plastic sheets to dispose of chemical pollutants, such as drained lubricating or transmission fluids, grease, soaps, concrete mixer washwater, or asphalt, produced as a by-product of the construction activities.

At the completion of the construction work, sumps shall be removed and the area restored to its original condition as specified in section 8 of this specification. Sump removal shall be conducted without causing pollution.

Sanitary facilities, such as chemical toilets or septic tanks, shall not be located next to live streams, wells, or springs. They shall be located at a distance sufficient to prevent contamination of any water source. At the completion of construction activities, facilities shall be disposed of without causing pollution as specified in section 8 of this specification.

## **5. Air pollution**

The burning of brush or slash and the disposal of other materials shall adhere to State and local regulations.

Fire prevention measures shall be taken to prevent the start or spreading of wildfires that may result from project activities. Firebreaks or guards shall be constructed and maintained at locations shown on the drawings.

All public access or haul roads used by the Contractor during construction of the project shall be sprinkled or otherwise treated to fully suppress dust. All dust control methods shall ensure safe construction operations at all times. If chemical dust suppressants are applied, the material shall be a commercially available product specifically designed for dust suppression and the application shall follow manufacturer's requirements and recommendations. A copy of the product data sheet and manufacturer's recommended application procedures shall be provided to the Engineer 5 working days before the first application.

## **6. Maintenance, removal, and restoration**

All pollution control measures and temporary works shall be adequately maintained in a functional condition for the duration of the construction period. All temporary measures shall be removed and the site restored to near original condition.

## **7. Measurement and payment**

Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the item of work to which it is made subsidiary. Such items, and the items to which they are made subsidiary, are identified in section 8 of this specification.

All payments to contractors will be made in accordance to the terms of the contract between the Owner and the Contractor.

## **8. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details therefore are:

### Work Items: Pollution Control

- (1) This item shall consist of precautions taken by the Contractor to minimize degradation of water quality passing through the job site during construction operations. All necessary precautions shall be taken to ensure compliance with water quality standards of the State of Florida. Attention is called to Chapter 62-3, Florida Administrative Code and, in particular, the requirements that turbidity shall not exceed 29 Nephelometric Turbidity Units (NTU's) above natural background. Adequate silt containment procedures and equipment shall be used to control turbidity at all times.

- (2) The Contractor shall be responsible for containment of pollution sources, including, but not limited to, excavations, clearing and grubbing, earthfill, and other disturbed areas.
- (3) Turbidity barriers shall be installed prior to any excavation, structural removal, or placement of fill material and shall be maintained in effective condition at all locations until construction and vegetative measures are completed.

## Construction Specification 006—Seeding, Mulching, and Sod

### 1. Scope

The work consists of preparing berm side slopes, ditch side slopes and earthen retention pond side slopes above the normal water level. Also included is appropriating disturbed areas for treatment, furnishing and placing seed, sprigs, mulch, fertilizer, inoculant, lime, and other soil amendments, and anchoring mulch in designated areas as specified.

### 2. Material

**Seed**—All seed shall conform to the current rules and regulations of the Florida Department of Transportation (FDOT) and shall be from the latest crop available. It shall meet or exceed the standard for purity and germination listed in section 9.

Seed shall be labeled in accordance with state laws and the U.S. Department of Agriculture (USDA) rules and regulations under the Federal Seed Act in effect on the date of invitations for bids. Bag tag figures are evidence of purity and germination. No seed will be accepted with a test date of more than 9 months before the delivery date to the site.

Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. The percent of noxious weed seed allowable shall be as defined in the current State laws relating to agricultural seeds. Each type of seed shall be delivered in separately sealed containers and fully tagged, unless exception is granted in writing by the Engineer.

**Fertilizer**—Unless otherwise specified, the fertilizer shall be a commercial grade fertilizer. It shall meet the standard for grade and quality specified by state law. Where fertilizer is furnished from bulk storage, the Contractor shall furnish a supplier's certification of analysis and weight. When required by the contract, a representative sample of the fertilizer shall be furnished to the Engineer for chemical analysis.

**Inoculants**—The inoculant for treating legume seeds shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species and shall not be used later than the date indicated on the container or as otherwise specified. A mixing medium, as recommended by the manufacturer, shall be used to bond the inoculant to the seed. Two times the amount of the inoculant recommended by the manufacturer shall be used, except four times the amount shall be used when seed is applied using a hydraulic seeder. Seed shall be sown within 24 hours of treatment and shall not remain in the hydraulic seeder longer than 4 hours.

**Lime and other soil amendments**—Lime shall consist of standard ground agriculture limestone or approved equivalent. Standard ground agriculture limestone is defined as ground limestone meeting current requirements of the state Department of Agriculture. Other soil amendments shall meet quality criteria and application requirements specified in section 9.

**Straw mulch material**—Straw mulch shall consist of wheat, barley, oat or rye straw, hay, grass cut from native grasses, or other plants as specified in section 9. The mulch material shall be air-dry, reasonably light in color, and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds is not permitted. The Contractor shall provide a method satisfactory to the Engineer for determining weight of mulch furnished.

**Other mulch materials**—Mulching materials, such as wood cellulose fiber mulch, mulch tackifiers, synthetic fiber mulch, netting, and mesh, are other mulching materials that may be required for specialized locations and conditions. These materials, when specified, must be accompanied by the

manufacturer's recommendations for methods and coverage rate of application. All such materials used for Hydroseeding shall meet FDOT standards.

### **3. Seeding mixtures, sod, sprigs, and dates of planting**

The application rate per acre for seed mixtures, sprigs, or sod and date of seeding or planting shall be according to FDOT standards, as shown on the plans, or as specified in section 9.

### **4. Seedbed preparation and treatment**

Areas to be treated shall be dressed to a smooth, firm surface. On sites where equipment can operate on slopes safely, the seedbed shall be adequately loosened (a few inches deep) and smoothed. Depending on soil and moisture conditions, disking, cultipacking, or both may be necessary to properly prepare a seedbed. Where equipment cannot operate safely, the seedbed shall be prepared by hand methods by scarifying to provide a roughened soil surface so that broadcast seed will remain in place.

If seeding is to be accomplished immediately following construction operations, seedbed preparation may not be required except on a compacted, polished, or freshly cut soil surface.

Rocks larger than 6 inches in diameter, trash, weeds, and other debris that will interfere with seeding or maintenance operations shall be removed or disposed of as specified in section 9.

Seedbed preparation shall be discontinued when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed as determined by the Engineer.

### **5. Seeding, sprigging, fertilizing, mulching, and stabilizing**

All seeding or sprigging operations shall be performed in such a manner that the seed or sprigs are uniformly applied in the specified quantities in the designated areas. The method and rate of seed application shall be according to FDOT standards or as specified in section 9. Unless otherwise specified, seeding or sprigging shall be accomplished within 2 days after final grading is completed and approved.

Fertilizer, lime, and other soil amendments shall be according to FDOT standards or as specified in section 9. When specified, the fertilizer and soil amendments shall be thoroughly incorporated into the soil immediately following surface application.

The rate, amount, and kind of mulching or mesh shall be according to FDOT standards or as specified in section 9. Mulches shall be applied uniformly to the designated areas. They shall be applied to areas seeded no later than 2 working days after seeding has been performed. Straw mulch material shall be stabilized within 24 hours of application using a mulch crimper or equivalent anchoring tool or by a suitable tackifier. When the mulch crimper or equivalent anchoring tool is used, it shall have straight blades and be the type manufactured expressly for and capable of firmly punching the mulch into the soil. Where the equipment can be safely operated, it shall be operated on the contour. Hand methods shall be used where equipment cannot safely operate to perform the work required.

### **6. Sod**

Sod shall be used in critical areas as listed in section 9 below to prevent erosion. Sod shall be Bahia in rolls or pieces.

### **7. Contractor's Performance & Maintenance**

The contractor shall establish a stand of grass in all areas designated on the plan and in these

specifications. He shall water the grass at least once per week until full establishment unless there is sufficient rainfall to establish and maintain healthy grass. There must be at least 90% coverage of healthy grass prior to acceptance by the Engineer. The Engineer, at any time, may require restoration of the earthwork and replanting of grass in any areas in which the establishment or the grass stand does not appear to be developing satisfactorily.

## **8. Measurement and payment**

Compensation for any item of work described in the contract, but not listed in the bid schedule is included in the payment for the item of work to which it is made subsidiary. Such items and the item(s) to which they are made subsidiary are identified in section 9.

All payments to contractors will be made in accordance to the terms of the contract between the Owner and the Contractor.

## **9. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details are:

### Work Items: Grassing for Stabilization

- (1) Contractor shall provide sod, hydroseed or seed and mulch in areas as shown on the plans to stabilize the proposed earthwork and disturbed areas. All grassing materials, methods and application rates shall meet FDOT standards for the grassing types specified. Contractor shall be responsible for the successful establishment and maintenance of grass stabilization until final completion of the project and acceptance by Engineer.
- (2) Sod – Sod is used in critical areas for stabilization and erosion control. Place sod using staggered joints. Sod laid on slopes shall be staked in place according to FDOT standards to prevent slipping. The following placement schedule assumes sod pieces are 16” wide x 24” long:
  - a. Entire 15’ wide top of the impoundment berm
  - b. Two running pieces of sod on each side of the top on the side slope of the impoundment berm
  - c. Two running pieces on each side of the access road
  - d. Two running pieces on each side of the access ramps
  - e. Two running pieces around the pump intake pond
  - f. For all proposed ditches place two running pieces on the side slope and one on the flat ground adjacent to the ditch
  - g. For culverts and water control structures where there is no rip rap specified, sod the side slopes 8’ on each side of the structure to the top of bank and at least one piece of sod on the flat ground.
- (3) Hydroseed – Hydroseed with Bahia the impoundment berm on both sides from the toe to the bottom of the sod. Also, hydroseed the side slopes of the access ramps. All hydroseed provided and installed shall meet FDOT 570-3 requirements.
- (4) Seed and Mulch – Seed and mulch with Bahia all other disturbed areas not covered by shell rock, sod or hydroseed to prevent erosion.



## **Construction Specification 007—Construction Surveys**

### **1. Scope**

The work consists of performing all surveys, measurements, and computations required by this specification.

### **2. Equipment and material**

Equipment for construction surveys shall be of a quality and condition to provide the required accuracy. The equipment shall be maintained in good working order and in proper adjustment at all times. Records of repairs, calibration tests, accuracy checks, and adjustments shall be maintained and be available for inspection by the Engineer. Equipment shall be checked, tested, and adjusted as necessary in conformance with manufacturer's recommendations.

Materials include field notebooks, stakes, templates, platforms, equipment, spikes, steel pins, tools, and all other items necessary to perform the work specified.

### **3. Quality of work**

All work shall follow recognized professional practice and the standards of the industry, unless otherwise specified in section 9 of this specification. The work shall be performed to the accuracy and detail appropriate for the type of job. Notes, sketches, and other data shall be complete, recorded neatly, legible, reproducible, and organized to facilitate ease in review and allow reproduction of copies for job documentation. Survey equipment that requires little or no manual recording of field data shall have survey information documented as outlined in section 9 of this specification.

All computations shall be mathematically correct and shall include information to identify the bid item, date, and who performed, checked, and approved the computations. Computations shall be legible, complete, and clearly document the source of all information used, including assumptions and measurements collected.

If a computer program is used to perform the computations, the Contractor shall provide the Engineer with the software identification, vendor's name, version number, and other pertinent data before beginning survey activities. Computer generated computations shall show all input data, including values assigned and assumptions made.

The elevations of permanent and temporary bench marks shall be determined and recorded to the nearest 0.01 foot. Differential leveling and transit traverses shall be of such precision that the error of vertical closure in feet shall not exceed plus or minus 0.1 times the square root of the traverse distance in miles. Linear measurements shall be accurate to within 1 foot in 5,000 feet, unless otherwise specified in section 9 of this specification. The angular error of closure for transit traverses shall not exceed 1 minute times the square root of the number of angles turned.

The minimum requirements for placing slope stakes shall be at 100-foot stations for tangents and as little as 25 feet for sharp curves, breaks in the original ground surface, and at any other intermediate stations necessary to ensure accurate location for construction layout and measurement. Slope stakes and cross sections shall be perpendicular to the centerline. Significant breaks in grade shall be determined for cross sections. Distances shall be measured horizontally and recorded to the nearest 0.1 foot. Side shots for interim construction stakes may be taken with a hand level.

Unless otherwise specified in section 9 of this specification, measurements for stationing and establishing the location of structures shall be made to the nearest 0.1 foot.

Elevations for concrete work, pipes, and mechanical equipment shall be determined and recorded to the nearest 0.01 foot. Elevations for earth work shall be determined and recorded to the nearest 0.1 foot.

#### **4. Primary control**

The baselines and bench marks for primary control, necessary to establish lines and grades needed for construction, are available in digital format and have been located on the job site.

These baselines and bench marks shall be used as the origin of all surveys, layouts, and measurements to establish construction lines and grades. The Contractor shall take all necessary precautions to prevent the loss or damage of primary control points. Any stakes or control points lost or damaged by construction activity will be re-established by the Contractor or at the Contractor's expense.

#### **5. Construction surveys**

Before work starts that requires Contractor performed surveys, the Contractor shall submit in writing for the Engineer's review the name, qualifications, and experience of the individuals to be assigned to the survey tasks.

Contractor performed surveys shall consist of all work necessary for:

- establishing line and grade for all work
- setting slope stakes for all work
- checking and any supplemental or interim staking
- establishing final grade stakes
- performing quantity surveys, measurements, and computations for progress payments
- performing original (initial) and final surveys for determinations of final quantities
- other surveys as described in section 9 of this specification

#### **6. Staking**

The construction staking required for the item shall be completed before work on any item starts. Construction staking shall be completed as follows or as otherwise specified in section 9 of this specification:

***Clearing and grubbing***—The boundary of the area(s) to be cleared and grubbed shall be staked or flagged at a maximum interval of 500 feet, closer if needed, to clearly mark the limits of work.

***Excavation and fill***—Slope stakes shall be placed at the intersection of the specified slopes and ground line. Slope stakes and the reference stakes for slopes shall be marked with the stationing, required cut or fill, slope ratio, and horizontal distance from the centerline or other control line. The minimum requirements for placing slope stakes is outlined in section 3, Quality of work.

***Structures***—Centerline and offset reference line stakes for location, alignment, and elevation shall be placed for all structures.

#### **7. Records**

All survey data shall be recorded in fully identified, standard hard-bound, engineering survey field notebooks with consecutively numbered pages. All field notes and printed data shall include the purpose or description of the work, the date the work was performed, weather data, sketches, and the personnel who performed and checked the work. Electronically generated survey data and

computations shall be bound, page numbered, and cross referenced in a bound field notebook containing the index for all survey activities. All work shall follow recognized professional practice.

The construction survey records shall be available at all times during the progress of the work for examination and use by the Engineer and, when requested, copies shall be made available. The original field notebooks and other records shall be provided to and become the property of the Engineer before final payment and acceptance of all work.

Complete documentation of computations and supporting data for progress payments shall be submitted to the Engineer with each invoice for payment as specified in section 9 of the specification. When the Contractor is required to conduct initial and final surveys, as outlined in section 5, Construction Surveys, notes shall be provided as soon as possible after completion to the Engineer for the purpose of determining final payment quantities.

## **8. Payment**

Payment will not be provided under this item for the purchase price of materials or equipment having a residual value.

Compensation for any item of work described in the contract, but not listed in the bid schedule, will be included in the payment for the item of work to which it is made subsidiary. Such items and the item to which they are made subsidiary are identified in section 9 of this specification.

All payments to contractors will be made in accordance to the terms of the contract between the Contractor and the Owner.

## **9. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details are:

### Work Items: Construction Surveys

- (1) This item shall consist of performing all surveys, measurements, and computations required to layout, certify and complete the work as designed.
- (2) Surveyor shall submit to the Engineer for his review and approval reports which will include supporting survey data and calculations for the purposes of certifying the job progress for payments to the Contractor.
- (3) Surveyor shall provide elevation "spot checks" as requested by the Engineer during the progress of job.
- (4) Surveyor shall complete data collection as required for final certification and record drawings.

## **Construction Specification 008—Mobilization and Demobilization**

### **1. Scope**

The work consists of the mobilization and demobilization of the Contractor's forces and equipment necessary for performing the work required under the contract. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.

### **2. Equipment and material**

Mobilization shall include all activities and associated costs for transportation of Contractor's personnel, equipment, and operating supplies to the site, establishment of offices, buildings, and other necessary general facilities for the Contractor's operations at the site, and premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site, including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

### **3. Payment**

All payments to contractors will be made in accordance to the terms of the contract between the Contractor and the Owner.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

## **Construction Specification 010—Water for Construction**

### **1. Scope**

The work consists of furnishing, transporting, measuring, and applying water as specified.

### **2. Facilities and equipment**

The Subcontractor shall install and maintain access and haul roads and furnish, operate, and maintain all pumps, meters, piping, tanks, storage, and other facilities required to load, transport, store, distribute, and use construction water as specified.

### **3. Dust abatement and haul road maintenance**

Water for dust abatement and haul road maintenance shall be applied to haul roads and other dust producing areas as needed to prevent air pollution or excessive dust (which causes impaired vision on trafficked roads and in work areas) and to maintain the roads in good condition for safe and efficient operation during periods of use. Roads that may be jointly used with the public and by the Subcontractor's equipment shall have dust abatement provisions acceptable to the public entity that has road maintenance responsibility. No additional compensation to the contractor for water used for dust abatement and haul road maintenance shall be provided unless specified in section 7 of this specification.

### **4. Earthfill, drainfill, and rockfill**

Water required for proper installation of earthfill, drainfill, and/or rockfill shall be used in the fill materials as specified in the applicable construction specification(s). Compensation for construction water used for earthfill, drainfill, and/or rockfill shall be included in the Contractor's cost for these items of work unless an exception is stated in section 7 of this specification.

### **5. Concrete, mortar, and grout**

Water required in the mixing or curing of concrete, shotcrete, roller compacted concrete, or other portland cement mortar or grout shall meet the requirements of the applicable construction specifications and shall be used in conformance with those specifications. Payment for construction water used in these items is covered by the applicable concrete, mortar, grout specification, or a combination of these.

### **6. Other construction requiring water**

Water required and used for other construction activities under this contract, but not specifically covered by this specification, shall be considered subsidiary to the item(s) of work that requires its use.

### **7. Measurement and payment**

Water required during construction is available from existing on site water systems but water use must be coordinated with the Engineer. No compensation for the Contractor will be made for the use, pumping or hauling of water for construction.

## **Construction Specification 011—Removal of Water**

### **1. Scope**

The work consists of the removal of surface water and ground water as necessary to perform the construction required by the contract in accordance with the specifications. It shall include: (1) constructing, installing, building, and maintaining all necessary temporary water containment facilities, channels, and diversions, (2) furnishing, installing, and operating all necessary pumps, piping, and other facilities and equipment, and (3) removing all such temporary works and equipment after their intended function is no longer required.

### **2. Diverting surface water**

The Contractor shall install, maintain, and operate all cofferdams, channels, flumes, sumps, and all other temporary diversion and protective works needed to divert stream flow and other surface water through or around the construction site. Control of surface water shall be continuous during the period that damage to construction work could occur. Unless otherwise specified and/or approved, the diversion outlet shall be into the same drainage way that the water would have reached before being diverted.

The Contractor shall furnish the Engineer, in writing, a proposed plan for diverting surface water before beginning any construction activities for which a diversion is required, unless waived by the Engineer. Acceptance of this plan or the waiving of the plan requirement will not relieve the Contractor of the responsibilities related to this activity during the process of completing the work as specified.

### **3. Dewatering the construction site**

Foundations, cutoff trenches, and all other parts of the construction site shall be dewatered and kept free of standing water and muddy conditions as necessary for the proper execution of the work. The Contractor shall furnish, install, operate, and maintain all drains, sumps, pumps, casings, well points, and all other equipment required to properly dewater the site as specified. Dewatering systems that cause a loss of soil from the foundation areas will not be permitted.

The Contractor shall furnish the Engineer, in writing, a proposed plan for dewatering before commencing with any construction activity for which dewatering may be required, unless waived by the Engineer. Acceptance of this plan or the waiving of the plan requirement will not relieve the Contractor of the responsibilities for completing the specified work.

### **4. Erosion and pollution control**

Removal of water from the construction site, including the borrow areas, shall be accomplished so that erosion and the transporting of sediment and other pollutants are minimized. Dewatering activities shall be accomplished in a manner that the water table water quality is not altered. Pollution control activities shall not conflict with the requirements of Construction Specification 5, Pollution Control. Contractor must have a pollution control plan approved by the Florida Department of Environmental Protection and a dewatering plan approved by South Florida Water Management District before pumping or dewatering.

### **5. Removal of temporary works**

When temporary works are no longer needed, the Contractor shall remove them and return the area to a condition similar to that which existed before construction. Areas where temporary works were located shall be graded for sightly appearance with no obstruction to natural surface water flows or

the proper functioning and access to the works of improvement installed. The Contractor shall exercise extreme care during the removal stages to minimize the loss of soil sediment and debris trapped during construction.

Pipes, casings, and any other material used to dewater the site shall be removed from temporary wells. The wells shall be filled to ground level with clean gravel or other suitable material approved by the Contractor. The Contractor shall exercise extreme care to prevent pollution of the ground water by these actions.

## **6. Measurement and payment**

*All Methods*— Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the contract line item to which it is made subsidiary. Compensation for water removal shall be included as part of the line item for which it is required. No separate payment will be made for this task.

## **Construction Specification 021—Excavation**

### **1. Scope**

The work shall consist of the excavation required by the drawings and specifications and disposal of the excavated materials.

### **2. Classification**

Excavation is classified as common excavation, rock excavation, or unclassified excavation in accordance with the following definitions.

*Common excavation* is defined as the excavation of all materials that can be excavated, transported, and unloaded using heavy ripping equipment and wheel tractor-scrapers with pusher tractors or that can be excavated and dumped into place or loaded onto hauling equipment by excavators, having a rated capacity of one cubic yard or larger and equipped with attachments (shovel, bucket, backhoe, dragline, or clam shell) appropriate to the material type, character, and nature of the materials.

*Rock excavation* is defined as the excavation of all hard, compacted, or cemented materials that require blasting or the use of ripping and excavating equipment larger than defined for common excavation. The excavation and removal of isolated boulders or rock fragments larger than 1 cubic yard encountered in materials otherwise conforming to the definition of common excavation shall be classified as rock excavation. The presence of isolated boulders or rock fragments larger than 1 cubic yard is not, in itself, sufficient cause to change the classification of the surrounding material.

For the purpose of these classifications, the following definitions shall apply:

- *Heavy ripping equipment* is a rear-mounted, heavy duty, single-tooth, ripping attachment mounted on a track type tractor, having a power rating of at least 250 flywheel horsepower, unless otherwise specified in section 10.
- *Wheel tractor-scraper* is a self-loading (not elevating) and unloading scraper having a struck bowl capacity of at least 12 cubic yards.
- *Pusher tractor* is a track type tractor, having a power rating of at least 250 flywheel horsepower, equipped with appropriate attachments.
- *Unclassified excavation* is defined as the excavation of all materials encountered, including rock materials, regardless of their nature or the manner in which they are removed.

### **3. Blasting**

The transportation, handling, storage, and use of dynamite and other explosives shall be directed and supervised by a person(s) with proven experience and ability, who is authorized and qualified to conduct blasting operations.

Blasting shall be done in a manner as to prevent damage to the work or unnecessary fracturing of the underlying rock materials and shall conform to any special requirements in section 10 of this specification. When specified in section 10, the Contractor shall furnish the Engineer, in writing, a blasting plan before blasting operations begin.

### **4. Use of excavated material**

Suitable material from the specified excavations may be used in the construction of required earthfill for the roads, berms, or included in the fill required for land leveling. The suitability of material for specific purposes is determined by the Geotech to comply with the Engineer's specifications.



## **5. Disposal of waste materials**

All excavated material will remain the sole property of the Owner, none shall be removed from the site unless directed in writing by the Engineer. Mineral soil will be used for construction of the proposed infrastructure items such as berms, road base or as general site filling and grading. Organic soils will be used as topsoil for grass establishment on side slopes and in nontraffic areas of the construction site or may be evenly spread within the property in a manner that does not interfere with its intended use.

## **6. Excavation limits**

Excavations shall comply with OSHA Construction Industry Standards (29 CFR Part 1926) Subpart P, Excavations, Trenching, and Shoring. All excavations shall be completed and maintained in a safe and stable condition throughout the total construction phase. Structure and trench excavations shall be completed to the specified elevations and to the length and width required to safely install, adjust, and remove any forms, bracing, or supports necessary for the installation of the work. Excavations outside the lines and limits shown on the drawings or specified herein required to meet safety requirements shall be the responsibility of the Contractor in constructing and maintaining a safe and stable excavation.

## **7. Borrow excavation**

When the quantities of suitable material obtained from specified excavations are insufficient to construct the specified earthfills and earth backfills, additional material shall be obtained from onsite borrow areas as shown on the plans or as approved by the Engineer. The extent and depth of borrow pits within the limits of the designated borrow areas shall be as specified on the plans.

Borrow pits shall be excavated and finally dressed to blend with the existing topography and sloped to minimize erosion.

## **8. Over excavation**

Excavation in earth beyond the specified lines and grades shall be corrected by filling the resulting voids with approved, compacted earthfill. The exception to this is that, if the earth is to become the subgrade for riprap, rockfill, sand or gravel bedding, or drainfill, the voids may be filled with material conforming to the specifications for the riprap, rockfill, bedding, or drainfill. Before correcting an over excavation condition, the Contractor shall review the planned corrective action with the Engineer and obtain approval of the corrective measures.

## **9. Measurement and payment**

For items of work for which specific unit prices are established in the contract, the volume of each type and class of excavation within the specified pay limits is measured and computed to the nearest cubic yard by the method of average cross-sectional end areas or by methods outlined in section 10 of this specification. Regardless of quantities excavated, the measurement for payment is made to the specified pay limits in the contract except that excavation outside the specified lines and grades directed by the Engineer to remove unsuitable material is included. Excavation required because unsuitable conditions result from the Contractor's improper construction operations, as determined by the Engineer, is not included for measurement and payment.

Payment for each type and class of excavation is made at the contract unit price for that type and class of excavation. Such payment will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to the performance of the work, except that extra payment for backfilling over excavation will be made in accordance with the following

provisions.

Payment for backfilling over excavation, as specified in section 8 of this specification, is made only if the excavation outside specified lines and grades is directed by the Engineer to remove unsuitable material and if the unsuitable condition is not a result of the Contractor's improper construction operations as determined by the Engineer.

Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 10 of this specification.

All payments to contractors will be made in accordance to the terms of the contract between the Contractor and the Owner.

#### **10. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details are:

##### Work Items: Excavation – Common

- (1) This item shall consist of all common excavation necessary and incidental to construction of the design components as shown on the plans including:
  - a. Impoundment berm
  - b. Access and perimeter roads
  - c. Access ramps
  - d. Pump station
  - e. Pump sump
  - f. Water control structures and culverts
  - g. Water supply ditch
  - h. Borrow ditch
  - i. Seepage interception ditch

## **Construction Specification 023—Earthfill**

### **1. Scope**

The work consists of the construction of earth embankments, other earthfills, and earth backfills required by the drawings and specifications.

*Earthfill* is composed of natural earth materials that can be placed and compacted by construction equipment operated in a conventional manner.

*Earth backfill* is composed of natural earth material placed and compacted in confined spaces or adjacent to structures (including pipes) by hand tamping, manually directed power tampers or vibrating plates, or their equivalent.

### **2. Material**

All fill material shall be obtained from required excavations and designated borrow areas. The selection, blending, routing, and disposition of material in the various fills shall be subject to approval by the Engineer.

The Contractor shall consider all materials encountered in excavations, excluding muck and peat, unless the quantities are less than 25 percent of the total volume, as suitable for use in random fill, providing that they consist of two or more well graded soils to achieve the required compaction as specified in this section. Peat and muck materials excavated in the course of the project may be used for topsoil for grass establishment, spread in the field or disposed of on site as approved by the Engineer.

The Contractor shall use only material that is free of debris, roots, and organic matter in select fill areas. Peat and muck materials are not suitable for use in select fill.

- Cohesionless materials includes gravels, gravel-sand mixtures, sands, and gravelly sands generally exclusive of clayey and silty material - materials that are free-draining and for which impact compaction will not produce a well-defined, moisture-density relationship curve and for which the maximum density by impact methods will generally be less than by vibratory methods.
- Cohesive materials include silts and clays generally exclusive of sands and gravel - materials for which impact compaction will produce a well-defined, moisture-density relationship curve.

The Contractor shall furnish materials for each type of fill indicated.

#### *Select backfill*

Select Backfill shall be material that is well graded, free of debris, roots, organic matter, and peat. Select backfill shall be material excavated for the work (native) or may be imported. The Contractor may blend native materials to achieve a material that meets the requirements for Select Backfill if approved by Engineer. Select backfill shall be free of seeds of nuisance or exotic species. Select Backfill shall meet the following Unified Soil Classification System (ASTM D2487) designations:

- Water Retaining Embankments: CL, ML, SC
- Structure Backfill: SW, SP, SM

### *Random Backfill*

Random backfill shall be material that is well graded, free of debris, roots, muck and peat. Random backfill shall be material excavated for the work (native) or may be imported. The Contractor may blend native materials to achieve a material that meets the requirements for Random Backfill if approved by Engineer. Random backfill shall be free of seeds of nuisance or exotic species. Random Backfill shall meet the following Unified Soil Classification System (ASTM D2487) designations in addition to the classifications identified for Select Backfill: CH.

### *Unclassified Backfill*

Material excavated for the work or imported that can be compacted to the required density. Unclassified backfill shall be free of seeds of nuisance or exotic species.

The Contractor shall consider all materials encountered, regardless of type, character, composition, and condition thereof unclassified other than as indicated above. The Contractor shall estimate the quantity of various materials included prior to submitting Bid Form. Rock encountered shall be handled at no additional cost to the Contractor.

### **3. Foundation preparation**

Foundation preparation is required for dikes, ramps, and access roads which shall be prepared as follows:

- Dikes and ramps for water retention and borrow areas shall be stripped to a depth below ground as necessary to remove vegetation, roots and other unsuitable material (muck).
- Access roads and shell rock roads shall also be stripped as described above.
- Where muck soils do not exist in the subsoil the footprint of Access Roads and Shell Roads the Contractor may elect to spray the area with an approved herbicide then mow the dead vegetation as low as possible. After mowing, the soil surface should be cut with a farm tillage implement like a disc harrow enough times with delays of 1-7 days between cuts to allow the organics to decompose and effectively incorporate into the topsoil. Contractor shall submit to the Engineer for approval the herbicide, rate of application and information describing the tillage implement to be used for approval.
- All other activities and procedures related to clearing and grubbing not mentioned here can be found in CS002 Clearing and Grubbing.

Except as otherwise specified, earth foundation surfaces shall be graded to remove surface irregularities and shall be scarified parallel to the axis of the fill or otherwise acceptably scored and loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the earthfill and the surface material of the foundation shall be compacted and bonded with the first layer of earthfill as specified for subsequent layers of earthfill.

Earth abutment surfaces shall be free of loose, uncompacted earth in excess of 2 inches in depth normal to the slope and shall be at such a moisture content that the earthfill can be compacted against them to produce a good bond between the fill and the abutments.

Rock foundation and abutment surfaces shall be cleared of all loose material by hand or other effective means and shall be free of standing water when fill is placed upon them. Occasional rock outcrops in earth foundations for earthfill, except in dams and other structures designed to restrain the movement of water, shall not require special treatment if they do not interfere with compaction

of the foundation and initial layers of the fill or the bond between the foundation and the fill.

Foundation and abutment surfaces shall be no steeper than one horizontal to one vertical, unless otherwise specified. Test pits or other cavities shall be filled with compacted earthfill conforming to the specifications for the earthfill to be placed upon the foundation.

#### **4. Placement**

Earthfill shall not be placed until the required excavation and foundation preparations have been completed and the foundation has been inspected and approved by the Engineer. Earthfill shall be placed in approximately horizontal layers. The thickness of each layer before compaction shall not exceed the maximum thickness specified in section 10 or shown on the drawings. Materials placed by dumping in piles or windrows shall be spread uniformly to not more than the specified thickness before being compacted.

Hand compacted earth backfill shall be placed in layers, the thickness of which before compaction does not exceed the maximum thickness specified for layers of earth backfill compacted by manually directed power tampers.

Earth backfill shall be placed in a manner that prevents damage to the structures and allows the structures to assume the loads from the earth backfill gradually and uniformly. The height of the earth backfill adjacent to a structure shall be increased at approximately the same rate on all sides of the structure.

Earthfill and earth backfill in dams, levees, and other structures designed to restrain the movement of water shall be placed to meet the following additional requirements:

- (a) The distribution of materials throughout each zone shall be essentially uniform and the earthfill shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture, moisture content, or gradation from the surrounding material. Zone earthfills shall be constructed concurrently, unless otherwise specified.
- (b) If the surface of any layer becomes too hard and smooth for forming a proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed.
- (c) The top surface of embankments shall be maintained approximately level during construction with one exception: A crown or cross-slope of about 2 percent shall be maintained to ensure effective drainage or as otherwise specified for drainfill or sectional zones.
- (d) Dam embankments shall be constructed in continuous layers from abutment to abutment, except where openings to facilitate construction or to allow the passage of streamflow during construction are specifically authorized in the contract.
- (e) Embankments built at different levels, as described under (c) or (d) above, shall be constructed so that the slope of the bonding surfaces between embankment in place and embankment to be placed is not steeper than 3 feet horizontal to 1 foot vertical. The bonding surface of the embankment in place shall be stripped of all material not meeting the requirements of this specification and shall be scarified, moistened, and recompactd when the new earthfill is placed against it. This ensures a good bond with the new earthfill and obtains the specified moisture content and density at the contact of the in-place and new earthfills.

## 5. Control of moisture content

During placement and compaction of earthfill and earth backfill, the moisture content of the material being placed shall be maintained within the specified range.

The application of water to the earthfill material shall be accomplished at the borrow areas in-so-far as practicable. Water may be applied by sprinkling the material after placement on the earthfill, if necessary. Uniform moisture distribution shall be obtained by disking.

Material that is too wet when deposited on the earthfill shall either be removed or be dried to the specified moisture content prior to compaction.

If the top surface of the preceding layer of compacted earthfill or a foundation or abutment surface in the zone of contact with the earthfill becomes too dry to permit a suitable bond, it shall either be removed or scarified and moistened by sprinkling water to an acceptable moisture content before placement of the next layer of earthfill.

## 6. Compaction

**Earthfill**—Earthfill shall be compacted according to the following requirements for the class of compaction specified:

- Class A compaction—Each layer of earthfill shall be compacted as necessary to provide the density of the earthfill matrix not less than the minimum density specified in Section 10 or identified on the drawings. The earthfill matrix is defined as the portion of the earthfill material finer than the maximum particle size used in the compaction test method specified.
- Class B compaction—Each layer of earthfill shall be compacted to a mass density not less than the minimum density specified.
- Class C compaction—Each layer of earthfill shall be compacted by the specified number of passes of the type and weight of roller or other equipment specified or by an approved equivalent method. Each pass shall consist of at least one passage of the roller wheel or drum over the entire surface of the layer.

**Earth backfill**—Earth backfill adjacent to structures shall be compacted to a density equivalent to that of the surrounding in-place earth material or adjacent required earthfill or earth backfill. Compaction shall be accomplished by hand tamping or manually directed power tampers, plate vibrators, walk-behind, miniature, or self-propelled rollers. Unless otherwise specified, heavy equipment, including backhoe mounted power tampers or vibrating compactors and manually directed vibrating rollers, shall not be operated within 2 feet of any structure. Towed or self-propelled vibrating rollers shall not be operated within 5 feet of any structure. Compaction by means of drop weights operating from a crane or hoist is not permitted.

The passage of heavy equipment will not be allowed:

- Over cast-in-place conduits within 14-days after placement of the concrete
- Over cradled or bedded precast conduits within 7 days after placement of the concrete cradle or bedding
- Over any type of conduit until the backfill has been placed above the top surface of the structure to a height equal to one-half the clear span width of the structure or pipe or 2 feet, whichever is greater, except as may be specified in section 10.

Compacting of earth backfill adjacent to structures shall not be started until the concrete has attained the strength specified in section 10 for this purpose. The strength is determined by compression testing of test cylinders cast by the Contractor's quality control personnel for this purpose and cured at the work site in the manner specified in ASTM C 31 for determining when a structure may be put into service.

When the required strength of the concrete is not specified as described above, compaction of earth backfill adjacent to structures shall not be started until the following time intervals have elapsed after placement of the concrete.

Structure	Time interval (days)
Vertical or near-vertical walls with earth loading on one side only	14
Walls backfilled on both sides simultaneously	7
Conduits and spillway risers, cast-in-place (with inside forms in place)	7
Conduits and spillway risers, cast-in-place (inside forms removed)	14
Conduits, pre-cast, cradled	2
Conduits, pre-cast, bedded	1
Cantilever outlet bents (backfilled both sides simultaneously)	3

**Reworking or removal and replacement of defective earthfill-** Earthfill placed at densities lower than the specified minimum density or at moisture contents outside the specified acceptable range of moisture content or otherwise not conforming to the requirements of the specifications shall be reworked to meet the requirements or removed and replaced by acceptable earthfill. The replacement earthfill and the foundation, abutment, and earthfill surfaces upon which it is placed shall conform to all requirements of this specification for foundation preparation, approval, placement, moisture control, and compaction.

## 8. Testing

During the course of the work, the Engineer may perform quality assurance tests required to identify material, determine compaction characteristics, determine moisture content, and determine density of earthfill in place. Tests performed by the Engineer will be used to verify that the earthfills conform to contract requirements of the specifications and not as a replacement for the Contractor's quality control program. The Contractor shall use a certified geotechnical testing company to complete periodic testing as specified in Section 10 below to verify quality of work and the results. The results of the compaction tests shall be submitted directly to the Engineer by the testing lab.

Densities of earthfill requiring Class A compaction will be determined in accordance with ASTM D 1,556, D 2,167, D 2,922, or D 2,937, except that the volume and moist weight of included rock particles larger than those used in the compaction test method specified for the type of fill will be determined and deducted from the volume and moist weight of the total sample before computation of density or, if using the nuclear gauge, added to the specified density to bring it to the measure of equivalent composition for comparison (See ASTM D 4718). The density so computed is used to determine the percent compaction of the earthfill matrix. Unless otherwise specified, moisture content is determined by one of the following methods: ASTM D 2216, D 3017, D 4643, D 4944, or D 4959.

## 9. Measurement and payment

For items of work for which specific unit prices are established in the contract, the volume of each type and compaction class of earthfill and earth backfill within the specified zone boundaries and pay limits is measured and computed to the nearest cubic yard by the method of average cross-sectional end areas. Unless otherwise specified in section 10, no deduction in volume is made for embedded items, such as, but not limited to, conduits, inlet structures, outlet structures, embankment drains, sand diaphragm and outlet, and their appurtenances.

All payments to contractors will be made in accordance to the terms of the contract between the Contractor and the Owner.

## 10. Items of work and construction details

Items of work to be performed in conformance with this specification and the construction details are:

### Work Items: Earthfill – General Site Grading

- (1) This item shall consist of pushing, loading, hauling, placement, and Class C compaction of all earthfill required for filling around construction areas and land smoothing.
- (2) *Random Backfill* material for general site grading will be from one of the following sources, listed in the order of preference:
  - Excavated material which does not meet *Select Fill* standards
  - General site grading
  - Nearby site work excavations
- (3) Compaction shall be Class C. The material shall be free of sod, brush, roots, or other perishable materials, large rocks, and hard lumps or clods larger than 6 inches in size. The moisture content of fill material shall be maintained within the limits necessary to permit efficient blending, bonding, and compaction of the materials. The fill materials shall be deposited evenly in layers no thicker than 6"-9". Each layer shall be thoroughly compacted by at least one pass over the entire surface by standard earth moving equipment in order to provide a uniformly dense fill. No compaction test submittals to the Engineer are required for General Site Grading.
- (4) All earthfill shall be placed in a manner so as to minimize air and water pollution.

### Bid Item: Earthfill – Under Concrete Structures

- (1) This item shall consist of pushing, loading, hauling, placement, and Class A compaction of all earthfill required for foundations for concrete structures.
- (2) The *Select Backfill* material will be from mineral soil excavated from one of the following sources, listed in the order of preference:
  - Designated borrow site
  - Suitable overburden material cut from construction site
- (3) Compaction shall be Class A. The material shall be free of sod, brush, roots, or other perishable materials, large rocks and hard lumps or clods larger than 6 inches in size. The moisture content of fill material shall be maintained within the limits necessary to permit efficient blending, bonding, and compaction of the materials. The fill materials shall be



deposited in 6-9-inch layers. Each layer shall be thoroughly compacted by at least three passes over the entire surface by standard a vibratory roller or hand compacted with vibratory equipment in order to provide a uniformly dense road base to the height above ground specified in the drawings. The Engineer may request advance notice prior to the installation of concrete structures are installed to personally verify the foundation compaction techniques and density.

- (4) Compacted fill shall meet or exceed 95% density as per AASHTO T-180.
- (5) All earthfill shall be placed in a manner so as to minimize air and water pollution.

Bid Item: Earthfill – Culverts and Water Control Structures

- (1) This item shall consist of pushing, loading, hauling, placement, and Class A compaction of all earthfill required for the installation of culverts and water control structures.
- (2) The *Select Backfill* material will be from mineral soil excavated from one of the following sources, listed in the order of preference:
  - Designated borrow site
  - Suitable overburden material cut from construction site
- (3) Compaction shall be Class A. The material shall be free of sod, brush, roots, or other perishable materials, large rocks and hard lumps or clods larger than 6 inches in size. The moisture content of fill material shall be maintained within the limits necessary to permit efficient blending, bonding, and compaction of the materials. The fill materials shall be deposited in 6-9-inch layers. Each layer shall be thoroughly compacted by at least three passes over the entire surface by a vibratory hand compactor in order to provide a uniformly dense road base to the height above ground specified in the drawings. The Engineer may request advance notice prior to the installation of concrete structures are installed to personally verify the foundation compaction techniques and density.
- (4) Compacted fill shall meet or exceed 95% density as per AASHTO T-180.
- (5) The Geotech will oversee the installation of all structures and will verify compaction of each backfill layer by performing and documenting at least one standard compaction test before proceeding to the next layer. For long structures compaction tests will be required at a maximum spacing of 50' for each lift. The compaction tests should be staggered to new locations along the structure on consecutive lifts, do not use the same location for all layers tested. The Geotech shall provide compaction test reports to the Engineer for each structure installed for his review and approval. Structures that do not meet minimum compaction will be corrected at the Contractor's expense.
- (5) All earthfill shall be placed in a manner so as to minimize air and water pollution.

Bid Item: Earthfill – Dikes (Berms)

- (1) This item shall consist of pushing, loading, hauling, placement, and Class A compaction of all earthfill required for forming dikes and associated access ramps.
- (2) The dike will be constructed from *Select Earthfill* excavated from one of the following sources, listed in the order of preference:
  - Designated borrow site
  - Suitable overburden material cut from construction site

- Adjacent roadbed to be removed
- (3) Compaction shall be Class A. The material shall be free of sod, brush, roots, or other perishable materials, large rocks and hard lumps or clods larger than 6 inches in size. The moisture content of fill material shall be maintained within the limits necessary to permit efficient blending, bonding, and compaction of the materials. The fill materials shall be deposited in 6-9-inch layers. Each layer shall be thoroughly compacted by at least three passes over the entire surface by standard a vibratory roller in order to provide a uniformly dense road base to the height above ground specified in the drawings.
  - (4) Compacted fill shall meet or exceed 95% density as per AASHTO T-180.
  - (5) All clearing shall be placed in a manner so as to minimize air and water pollution.
  - (6) Prior to commencement of work the Contractor shall submit a quality assurance plan to the Engineer which will include geotechnical testing for the proposed dike. At least one test is required per lift in locations randomly selected by the Engineer or geotechnical testing firm at a maximum of 500 ft. intervals, or as recommended by the Geotech. Extra tests shall be required where the soil characteristics change (color, moisture content, particle size, etc.) Tests sites shall be staggered to new locations on consecutive lifts to provide maximum testing coverage. The Engineer, at his option, may require third party testing at the Owner's expense. Copies of results of each test shall be submitted directly to the Engineer.

Bid Item: Earthfill – Access Roads

- (1) This item shall consist of pushing, loading, hauling, placement, and Class A compaction of all earthfill required for constructing access roads to the site and around the perimeter of the impoundment.
- (2) The access road will be constructed from *Select Earthfill* excavated from one of the following sources, listed in the order of preference:
  - Designated borrow site
  - Suitable overburden material cut from construction site
  - Adjacent roadbed to be removed
- (3) Compaction shall be Class A. The material shall be free of sod, brush, roots, or other perishable materials, large rocks and hard lumps or clods larger than 6 inches in size. The moisture content of fill material shall be maintained within the limits necessary to permit efficient blending, bonding, and compaction of the materials. The fill materials shall be deposited in 6-9-inch layers. Each layer shall be thoroughly compacted by at least three passes over the entire surface by standard a vibratory roller in order to provide a uniformly dense road base to the height above ground specified in the drawings.
- (7) Compacted fill shall meet or exceed 95% density as per AASHTO T-180.
- (8) All clearing shall be placed in a manner so as to minimize air and water pollution.
- (9) The Geotech will perform compaction tests for the impoundment perimeter road on approximately 500' intervals. Test sites shall be relocated on consecutive lifts to provide maximum testing coverage. Testing is not required for the shell rock access road from Driggers Road to the impoundment.

## Construction Specification 031/034M – Concrete, Form Work, and Reinforcing Steel

### 1. Scope

Furnish all materials, labor, and equipment necessary to complete all concrete work shown on the drawings and specified herein. The work shall include the following:

- a. Form work for all footings, foundations, beams, slabs, equipment pads, etc.
- b. The placing of all reinforcing steel.
- c. The mixing, placing, curing, and finishing of all concrete work.

### 2. General requirements

All applicable provisions in the General Specifications shall govern the work under this section. Some of the items mentioned in this section are described further in other sections of these Specifications.

### 3. Qualifications of installers

Throughout the installation of the work of this section, provide at least one person who shall be thoroughly familiar with the specified requirements, codes, and standards applicable to this work. This person shall be trained and experienced in the necessary skills, shall be present at the site, and shall direct all work performed under this section. In acceptance or rejection of work performed under this section, the Engineer will make no allowance for lack of skill by the workers.

### 4. Material

**Cement** shall be type I "Portland Cement" to conform to the standard specifications for Portland Cement (ASTM designation C-150).

**Aggregates**, fine and coarse, shall conform to the "Tentative Specifications for Concrete Aggregates" (ASTM designation C-33). *All aggregates shall be iron-free.*

**Water** used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement.

**Reinforcing steel** shall be Grade 60 deformed reinforcement steel. Bars shall be clean and free from loose rust, oil, or any other foreign material that will reduce bond. Bars shall conform to the applicable ASTM standards listed in ACI 318.

**Admixtures** to be used in concrete shall be subject to prior approval by the Engineer. Air-entraining admixtures, water-reducing admixtures, retarding admixtures, and accelerating admixtures shall conform to the applicable ASTM standards listed in ACI 318. Polymeric (synthetic) fibers shall be added to all concrete used in this project at a minimum rate of 1.5 pounds per cubic yard of concrete to control shrinkage cracking where specified.

**Wood forms** shall be made of sound lumber and shall conform to the dimensions of the members as shown on the drawings. They shall be built substantially water-tight to prevent leakage of water, cement, and finer particles of aggregates. Forms for concrete surfaces that are to be left exposed shall be made of a minimum of 5/8 inches thick waterproof plywood.

**Isolation joints** All expansion joint materials shall be 1/2 an inch asphalt-impregnated fiber strips.

## **5. Concrete mix design**

Unless otherwise noted on the plan sheets, concrete for all work shall be designed for a minimum compressive strength of 4,000 psi at 28 days. Ballast concrete for water control structures may be 3000 psi at 28 days and does not require reinforcement steel or fiber-reinforcement.

All concrete for the slab and access steps shall be fiber-reinforced with fibrillated polypropylene fibers at a rate of 1.5 pounds of fiber per cubic yard of concrete.

The concrete mixture shall not exceed a maximum slump of 4 inches before addition of fiber and water reducing admixtures and 6 inches after the additions noted.

The proportions of aggregates to cement shall be such as to produce a workable mixture that will work readily into the corners and angles of the forms and around all reinforcing without permitting angles of the forms and around all reinforcing without permitting the materials in the mixture to segregate or for free water to collect on the surface.

All of the materials shall be mixed until an even and uniform distribution of materials is obtained.

Ready mixed concrete shall conform to ASTM C-94 designation.

Under conditions where the temperature is 85° F or above a concrete retarding admixture shall be used in all design mixes and shall be added at the batch plant.

The batch plant is responsible for adjusting design mixes to maintain the specified concrete strength and slump.

## **6. Reinforcing steel**

All reinforcing steel shall be thoroughly cleaned of rust and other coatings that will reduce bond with the concrete.

Place in the correct positions and of sizes, as shown on the drawings, and wired so that displacement will not occur when concrete is poured.

Reinforcing steel shall be bent around all corners and lapped not less than 40 diameters and securely tied with #18 gauge annealed wire.

All reinforcing shall be supported by approved precast concrete blocks, plastic chairs, or by galvanized metal spacers.

Reinforcing steel supports shall be placed at such an interval so as to properly hold the reinforcing steel and wire mesh in its proper position while the concrete is poured.

Reinforcing steel shall be so placed to provide a concrete covering of 3 inches on all footings and grade beams, 1/2 an inch in beams, and 3/4 of an inch in slabs.

Do not weld reinforcing steel except where noted.

## **7. Concrete placing**

Concrete shall not be placed until all reinforcement, pipes, conduits, water-proofing and other set-in items have been inspected and approved.

Concrete shall not be placed on soft or water soaked ground.

All wood forms are to be thoroughly wetted or oiled before placing reinforcing steel.

In case of inclement weather, freshly poured concrete shall be protected against infiltration of external water by covering the concrete with tarpaulins or similar waterproof protection until the concrete has set.

The rate and method of placing the concrete between construction joints shall be poured in a continuous operation, with no more than one hour of lapse time between pours.

Footings shall have no horizontal joints.

If necessary, only vertical joints will be allowed, but may only be located at junctions of wide and narrow sections or where the strength of the footing will not be impaired.

All expansion joints shall be built into the work as shown and detailed on the drawings.

All concrete shall be thoroughly compacted with a mechanical vibrator or by other suitable means and shall be thoroughly worked around all reinforcement, corners of forms, pipes, and embedded fixtures.

Concrete shall not be poured during cold weather. The ambient temperatures must be above 40° F for at least 72 hours before concrete is placed.

The temperature of the concrete shall not be below 40° F nor above 120° F.

Concrete floor slabs on earth shall be placed over a well tamped and prepared sub-grade.

The concrete shall be poured at the required thickness and be properly screeded at the proper elevations to receive finish specified.

The Contractor shall be present on the site the entire time the slab is being poured and finished.

## **8. Concrete finishes**

All exposed concrete foundation walls, piers, and/or footings shall be rubbed smooth.

No honey-combed surfaces will be accepted.

All concrete slabs shall be integrally finished, screeded level, and floated.

All concrete slabs shall receive a light broom finish.

## **9. Concrete curing**

The Contractor shall maintain the concrete in a moist condition for at least seven (7) days after the placement of the concrete by flooding with water, covering with polyethylene, or using approved curing compounds.

## **10. Testing and control of concrete**

If deemed necessary, the Engineer may, at his option, appoint and pay for the services of a testing laboratory for the testing of concrete.

Contractor shall furnish all concrete mix designs to the Engineer for review, if requested.

The Contractor shall furnish, without additional compensation, at least one standard cylinder test per 20 cubic yards of concrete but no less than one test per slab if poured in place. Test must be completed by a certified lab approved by the Engineer.

Testing of questionable areas as a result of laboratory reports indicating lower strengths than specified or retesting of any materials that have previously failed to meet specifications shall be paid

for by the Contractor at no additional cost to the Owner.

#### **11. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details are:

##### Work Items: Concrete, Form Work, Reinforcing Steel:

- (1) Concrete slab for electrical rack and motor controls
- (2) Ballast for water control structures as specified on plans
- (3) Concrete for access slabs/steps to pump station and sluice gate.

## **Construction Specification 035 – Precast Concrete**

### **1. Scope**

Furnish all materials, labor, hauling and equipment necessary to install precast concrete components as shown on the design plans.

### **2. General Requirements**

All applicable provisions in the General Specifications shall govern the work under this section. Some of the items mentioned in this section are described further in other sections of these Specifications.

### **3. Qualifications of Installers**

Throughout the installation of the work of this section, provide at least one person who shall be thoroughly familiar with the specified requirements, codes, and standards applicable to this work. This person shall be trained and experienced in the necessary skills, shall be present at the site, and shall direct all work performed under this section. In acceptance or rejection of work performed under this section, the Engineer will make no allowance for lack of skill by the workers.

### **4. Reference Standards**

Precast concrete components shall be manufactured and installed according to the following standards:

1. ASTM C890
2. ACI 318

### **5. Items Included**

Precast components include the following items:

1. Two concrete pump sumps for drainage pumps
2. One sump for sluice gate discharge structure

### **6. Reinforcing Steel**

All reinforcing steel shall be designed by precast concrete supplier.

### **7. Precast Concrete Placing**

The Contractor shall use care when handling the precast pieces not to damage the components in any way. The Contractor should lift the pieces through the lifting eyes provided by the manufacturer using approved straps. The foundations for precast pieces shall be properly prepared as shown on the plan sheets before installation. Precast shall be installed level, plumb and dimensionally correct.

### **8. Precast Concrete Finishes**

All exposed concrete foundation walls, piers, and/or footings shall be rubbed smooth.

No honey-combed surfaces will be accepted.

All concrete slabs shall receive a light broom finish.

### **9. Submittals**

Submittals shall according to GS 025.

## **10. Approved Suppliers**

Precast concrete shall be designed and manufactured according to the plans by:

1. Forterra or equal



## **Construction Specification 036 – Flexamat®**

### **1. General Description**

Flexamat® is a tied concrete block system that is manufactured with a site-specific underlayment. The emergency overflow weir shall be stabilized as shown on the plans using Flexamat® with an integral synthetic erosion control blanket made of Recyclex® TRM-V. Additional underlayment is not required. All surfaces below elevation 34.7' which are exposed to potential water flow shall be stabilized, including both ends of the weir.

### **2. Shipping and Handling**

Flexamat® is packaged in rolls for shipment. The rolls have a minimum weight of 10 pounds per square feet. Rolls are packaged with handling straps. For safety, it is recommended that these straps only be used for lifting below 2' as a means to place heavy duty lifting straps under rolls. Upon delivery, rolls may be left exposed for up to 30 days. If exposure will exceed 30 days, the rolls must be tarped or otherwise covered to minimize UV exposure.

### **3. Subgrade Preparation**

The prepared subgrade shall provide a firm, unyielding foundation for the mats. The subgrade shall be prepared as detailed on the plans. Subgrade shall be constructed from Select Fill which is placed and compacted per Construction Specification 023 – Earthfill. Compaction may be completed by hand using repeated passes of a vibratory plate compactor. All surfaces which will receive mat placement shall be uniformly compacted. Undulations, rolls, knolls and rises in the subgrade to which the tied concrete mat is able to contour over and maintain intimate contact with the subgrade will be allowed. The Flexamat® block has a height of 2.25" and this dimension shall be considered when preparing subgrade. Before unrolling the Flexamat®, apply seed and soil amendments directly to the prepared soil prior to installation of mats. Alternately, if infilling the spaces between the blocks with soil, grass seed may be mixed with the soil before placement. Use seed and soil amendments or topsoil per project specifications.

### **4. Unrolling**

Position the rolls in the direction to be unrolled, with the leading edge at the bottom of the roll with the line and grade shown on the plans and according to the manufacturer's installation guidelines. Flexamat® can be unrolled down or across slopes. It is important to consider the direction of any overland or channel flow when anchoring and installing the succeeding rolls for seams or abutments in the design. All edges exposed to concentrated flows, especially the upstream leading edges must be terminated and properly anchored according to engineer drawings. Overlapping seam should be installed like a shingle on a roof.

### **5. Seaming Rolls**

Panel seams (Channel and Slopes) perpendicular to the hydraulic flow must be overlapped. The downstream panels will be terminated and properly anchored according to manufacturer's recommendations and placed under the upstream panel by overlapping 18".

### **6. Edge Treatment:**

Flexamat® shall have a minimum toe-in as shown on design plans at edges perpendicular to hydraulic flow. Edges not exposed to surface sheet flow do not need to be toed if allowed by design plans and approved by the Engineer. Rather, a soil transition cover may be placed along the edge of mat to transition to landscape. Where permanent anchoring is required, e.g., installing mats on steep

slopes, the cables (polypropylene grid) shall be attached to the anchoring system as indicated on the contract drawings or as recommended by manufacturer. Important areas for considering anchoring are the leading edges, seams and overlaps.

## **Construction Specification 094—Contractor Quality Control**

### **1. Scope**

The work consists of developing, implementing, and maintaining a quality control system to ensure the specified quality is achieved for all materials and work performed.

### **2. Equipment and materials**

Equipment and material used for quality control shall be of the quality and condition required to meet the test specifications cited in the contract. Testing equipment shall be properly adjusted and calibrated at the start of operations and the calibration maintained at the frequency specified. Records of equipment calibration tests shall be available to the Engineer at all times. Equipment shall be operated and maintained by qualified operators as prescribed in the manufacturer's operating instructions, the references specified, and as specified in section 10 of this specification. All equipment and materials used in performing quality control testing shall be as prescribed by the test standards referenced in the contract or in section 10.

All equipment and materials shall be handled and operated in a safe and proper manner and shall comply with all applicable regulations pertaining to their use, operation, handling, storage, and transportation.

### **3. Quality control system**

The Contractor shall develop, implement, and maintain a system adequate to achieve the specified quality of all work performed, material incorporated, and equipment furnished before use. The system established shall be documented in a written plan, developed by the Contractor and approved by the Engineer. The system activities shall include the survey, material testing and inspections needed to verify the adequacy of completed work and procedures to be followed when corrective action is required. Daily records to substantiate the conduct of the system shall be maintained by the Contractor. The quality control plan shall cover all aspects of quality control and shall address, as a minimum, all specified testing and inspection requirements. The plan provided shall be consistent with the planned performance in the Contractor's approved construction schedule. The plan shall identify the Contractor's onsite quality control manager and provide an organizational listing of all quality control personnel and their specific duties. The written plan shall be submitted to the Engineer within 15 calendar days after notice of award. The Contractor shall not proceed with any construction activity that requires inspection until the written plan is approved by the Engineer.

The quality control system shall include, but not be limited to, a rigorous examination of construction material, processes, and operation, including testing of material and examination of manufacturer's certifications as required, to verify that work meets contract requirements and is performed in a competent manner.

### **4. Quality control personnel**

Quality control activities shall be accomplished by competent personnel. A competent person is: one who is experienced and capable of identifying, evaluating, and documenting that materials and processes being used will result in work that complies with the contract and who has authority to take prompt action to remove, replace, or correct such work or products not in compliance. Off-site testing laboratories shall be certified or inspected by a nationally recognized entity. The Contractor shall submit to the Engineer, for approval, the names, qualifications, authorities, certifications, and availability of the competent personnel who will perform the quality control activities.

## **5. Post-award conference**

The Contractor shall meet with the Engineer before any work begins and discuss the Contractor's quality control system. The Contractor and the Engineer shall develop a mutual understanding regarding the quality control system.

## **6. Records**

The Contractor's quality control records shall document both acceptable and deficient features of the work and corrective actions taken. All records shall be on forms approved by the Engineer, be legible, and be dated and signed by the competent person creating the record.

Unless otherwise specified in section 10 of this specification, records shall include:

- a. Documentation of shop drawings, including date submitted to and date approved by the Engineer, results of examinations, any need for changes or modifications, manufacturer's recommendations and certifications, if any, and signature of the authorized examiner.
- b. Documentation of material delivered including quantity, storage location, and results of quality control examinations and tests.
- c. Type, number, date, time, and name of individual performing quality control activities.
- d. The material or item inspected and tested, the location and extent of such material or item, and a description of conditions observed and test results obtained during the quality control activity.
- e. The determination that the material or item met the contract provisions and documentation that the Engineer and Contractor were notified.
- f. For deficient work, the nature of the defects, specifications not met, corrective action taken, and results of quality control activities on the corrected material or item.

## **7. Reporting results**

The results of Contractor quality control inspections and tests shall be communicated simultaneously in electronic .pdf format to the Engineer and Contractor immediately upon completion of the inspection or test. Unless otherwise specified in section 10, the original plus one copy of all records, inspections, tests performed, and material testing reports shall be submitted to the Engineer within two working days of completion. The original plus one copy of documentation of material delivered shall be submitted to the Engineer before the material is used.

## **8. Access**

The Contractor and the Engineer shall be given free access to all testing equipment, facilities, sites, and related records for the duration of the contract.

## **9. Payment**

Compensation for any item of work described in the contract, but not listed in the bid schedule, will be included in the payment for the item of work to which it is made subsidiary. All payments to contractors will be made in accordance to the terms of the contract between the Contractor and the Owner.

## **10. Items of work and construction details**

Payments are not made under this item of work. Instead, Contractor Quality Control is an essential segment of other tasks for which payment is made.

## **Construction Specification CS 342—Critical Area Planting**

### **1. Definition**

Establishing permanent vegetation on sites that have or are expected to have high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.

### **2. Purpose**

- Stabilize areas with existing or expected high rates of soil erosion by water.
- Stabilize areas with existing or expected high rates of soil erosion by wind.
- Restore degraded sites that cannot be stabilized through normal farming practices.
- Stabilize coastal areas, such as sand dunes and riparian areas.

### **3. Conditions where practice applies**

This practice applies to highly disturbed areas such as active or abandoned mined lands, urban conservation sites, road construction areas, conservation practice construction sites, areas needing stabilization before or after natural disasters such as floods, hurricanes, tornados and wildfires and other areas degraded by human activities or natural events.

### **4. Criteria**

*General criteria applicable to all purposes*

Prior to planting, conduct a site investigation to identify any physical, chemical or biological conditions that could affect the successful establishment of vegetation.

Species selected for seeding or planting need to be suited to current site conditions and intended uses.

Do not plant any species found on the Florida Dep. of Agriculture and Consumer Services or the Florida Dep. of Environmental Protection noxious or prohibited weed lists. Additionally, do not plant any species listed as a Category 1 invasive species by the Florida Exotic Pest Plant Council (see FOTG Section I [f] [4]).

The species selected need to be able to achieve adequate density and vigor to sufficiently stabilize the site such that suitable use can be made with ordinary management activities within an appropriate timeframe.

Prior to planting seeding or planting rate; minimum quality of planting stock, such as Pure Live Seed (PLS) or stem caliper; method of seedbed preparation; and method of establishment need to be specified. Use only viable, high quality seed or planting stock.

Selection of time and manner of planting needs to be based on what best ensures establishment and growth of the selected species. Specify what constitutes successful establishment, e.g., minimum percent ground/canopy cover, percent survival, stand density, etc. before application.

Within the approved planting dates for a species, schedule planting to optimize soil moisture for germination and/or establishment.

Apply soil amendments (e.g., lime, fertilizer, compost) at rates necessary to insure stand establishment. Follow all soil amendment application and pest control the requirements in the Florida Field Office Technical Guide (FOTG).

Protect plantings from pests (e.g., weeds, insects, diseases, livestock, wildlife) as necessary to ensure stand establishment.

Use current approved wind and/or water erosion prediction technology to determine the amount of plant biomass and cover needed to reduce wind and water erosion to the planned soil loss objective.

Impact to cultural resources, wetlands, and Federal and State protected species needs to be avoided or minimized to the extent practical during planning, design, and implementation of this conservation practice in accordance with established National and Florida NRCS policy; General Manual (GM) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26; National Planning Procedures Handbook (NPPH) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH); and The National Environmental Compliance Handbook (NECH).

*Additional criteria to restore degraded inland sites*

Site preparation - To ensure proper equipment operation and ensure proper site and seedbed preparation, gullies or deep rills need to be treated prior to site preparation if feasible. Minor land shaping and grading along with loose rock and scattered brush and/or tree removal can be performed as deemed necessary. Vertical banks need to be sloped to enable plant establishment. Salvage top soil, if present, during the shaping and grading operation and uniformly distribute back over the area prior to final seedbed preparation.

Soil Amendments - Add soil amendments, as needed, to ameliorate or eliminate physical or chemical conditions that inhibit plant establishment and growth. The required amendments, such as compost or manure, to add organic matter and improve soil structure and water holding capacity; agricultural limestone, to increase the pH of acid soils; or elemental sulfur, to lower the pH of calcareous soils need to be detailed in the site specification with amounts, timing, and method of application.

If practical, a current soil test (< 3 yr old) processed by the IFAS Extension Soil Testing Laboratory (ESTL) or equivalent laboratory should be used to determine the need for liming materials and plant nutrients. When a current soil test is not available, follow minimal fertilization recommendations outlined in Florida NRCS Critical Area Planting Guidance. Plant nutrients can be supplied from animal or poultry manure, agricultural by-products, or commercial fertilizer. Animal and poultry manure and other agricultural by-products (see <http://edis.ifas.ufl.edu/SS315>) can be sources of nutrients, but the material should be analyzed for nutrient content prior to use. When a laboratory analysis is not available, use the book values from the Florida NRCS Agricultural Waste Management Field Handbook, Chapter 4 – Agricultural Waste Characteristics, for estimated available nutrient content.

Plant selection - Use only perennial plant species. Plantings can consist of pure stands of perennial grasses, legumes, trees, shrubs, vines or mixtures of these classes of vegetations. Although CS342, is not completed until perennial vegetation is established, a short term temporary cover (nurse crop) may be necessary. Suggested nurse crops suitable for the different areas of the state can be found in the Florida NRCS Critical Area Planting Guidance Perennial warm season herbaceous species approved for use on critical areas are listed in Florida NRCS Critical Area Planting Guidance. At this time, there are no cool season perennial grasses recommended for Florida. Recommended trees,

shrubs and vines can be found on the Florida NRCS Plant List for Conservation Alternatives (FOTG Sect. II [g] [1]).

## **5. Considerations**

When practical, use native species or mixes that are adapted to the site and have multiple values. Select plants that will provide food and cover where wildlife is a prime concern. See “Management for wildlife: a supplement to wildlife standard and specifications for Florida” (NRCS, 1979) for recommended plants for wildlife.

Establishment activities need to be scheduled to avoid critical periods (e.g., mating, nesting, denning, rearing of young, etc.) when sensitive or protected species are present. Plans need to be in compliance with the Migratory Bird Treaty Act.

Vegetative cover on critical areas will reduce sediments and sediment related pollutants in surface water and nutrients leaching into groundwater. Operations necessary to prepare site for vegetation establishment (i.e., grading, shaping, seedbed preparation) may result in large quantities of sediments and associated chemicals being washed into surface waters prior to vegetation establishment.

Avoid species that may harbor pests. Planting multiple species will help to avoid loss of function due to species-specific pests.

## **6. Plans and Specifications**

Prepare plans and specifications for each field or management unit according to the criteria and operation and maintenance sections of this standard. Specifications need to describe the requirements for applying this practice to meet the intended purpose.

Record practice specifications using approved specification sheets, job sheets or other acceptable documentation. The following elements need to be addressed in the plan, as applicable, to meet the intended purpose.

- Site Preparation
- Topsoil
- Fertilizer Application
- Seedbed/Planting Bed Preparation Methods of Seeding/Planting
- Time of Seeding/Planting
- Selection of Species
- Seed/Plant Source
- Seed Analysis
- Rates of Seeding
- Mulching
- Planting Trees, Shrubs and Vines



- Supplemental Water for Plant Establishment
- Protection of Plantings

## **7. Operation and Maintenance**

Manage the area as long as necessary to stabilize the site and achieve the intended purpose.

Control or exclude pests that will interfere with the timely establishment of vegetation. Mowing may be necessary to control the competition of weeds and/or nurse crop during the establishment period of the perennial plants. If herbicides are needed, refer to Florida NRCS Conservation Practice Standard Pest Management, Code 595; follow current Univ. Florida, IFAS recommendations (<http://edis.ifas.ufl.edu/WG006>); and adhere to label instructions.

Inspections, reseeding or replanting, fertilization, and pest control may be needed to ensure that this practice functions as intended throughout its expected life. Observation of establishment progress and success should be performed at regular intervals until the practice has met the criteria for successful establishment and implementation.

Maintenance should include a regular lime and fertilization program based on soil test recommendations. In the absence of soil tests, follow general lime and fertilization recommendations listed for establishment.

Where establishment of vegetation creates potential habitat for grass-nesting birds, the impacts of vegetative disturbance upon these birds and their nests should be considered and included in operation and maintenance plans.

Do not conduct maintenance activities that result in disturbance of vegetation during the primary nesting season for grass-nesting birds where occupied habitat for these species exists.

## Construction Specification CS 382—Barbed Wire Fence

All fence construction shall meet or exceed NRCS practice code 382.

### 1. Materials

#### *Wire*

Use only new wire of two, twisted strands that are either class 3 galvanized 12.5 gauge (minimum) standard steel or class 3 galvanized 15.5 gauge (minimum) high-tensile steel. If wire only has 2-point barbs, then barbs should be no farther than 4 inches apart and, if wire has 4-point barbs, then barbs would be no farther than 5 inches apart. Fence shall have at least five strands of barbed wire for boundary fence.

#### *Wood Line posts.*

- Wood posts must be treated with a minimum of 0.4 lbs/ft<sup>3</sup> of chromate copper arsenate (CCA-Type A, B or C), or equivalent.
- Minimum 6 feet 6 inches long and 3-inch diameter.

#### *Wood Corner, brace, and gate posts*

#### Wood

- Wood posts must be treated with a minimum of 0.4 lb/ft<sup>3</sup> of chromate copper arsenate (CCA-Type A, B or C), or equivalent.
- Corner, brace, and gate posts must be at least 8 foot x 5 1/2"
- Horizontal brace members must be at least 6 feet 6 inches x 3 inches.
- Landscape timbers cannot be used for posts or brace members.

#### *Fasteners*

- For wood posts, use staples that are at least 9 gauge, class 3 galvanized. Minimum length for softwoods is 1 1/2 inches and for hardwoods is 1 inch.
- Use manufactured clips or minimum 14-gauge wire for steel line posts.

#### *Gates*

- Gates shall be provided as shown on the plans. Gates shall be hot dipped galvanized steel with galvanized hinges and hardware.

### 2. Construction

#### *Corners, Braces, Ends, and Gates*

#### Posts

- Set posts for all fence assemblies a minimum of 42 inches deep in holes with a diameter at least 2.5X the post diameter. The top of posts should be at least 2 inches above the top wire.
- Top wire height shall be an average of 46" above ground.
- Backfill wooden posts by thoroughly tamping soil around the post after every 4 inches of depth.

## Braces

- H-braces are required for all corner, pull, end, and gate assemblies.
- Anchor horizontal brace members to brace posts with a minimum 3/8 – 1/2 inches galvanized pin or 5/8” diameter rebar inserted in hole drilled in horizontal brace and upright post at joint that penetrates the horizontal member at least 4 inches.
- H-braces must have a tension member consisting of two complete loops of 9-gauge smooth single strand, 12-gauge double strand, or 12.5-gauge high-tensile wire. One end of the loop is attached to the anchor (corner, end, or gate) post 4 inches above the soil surface and the other end is attached to the brace post at the same height as the top of the horizontal brace member. Twist the loops to provide rigidity to the brace assembly.
- Tighten tension member with a tensioner made of permanent material such as rebar, pipe, or pressure treated wood.

## Corner and in-line pull assemblies

- A single inline brace assembly is required for any horizontal angle or terrain changes (> 150)
- A single inline brace assembly is required when the distance from end post to end post exceeds 660 feet.
- Use an H-brace assembly with two crossed tension members on fences not exceeding 660 feet and double H-brace corner assembly >660 feet .

## Wood Line Posts

- The maximum distance between wood line posts is 16 feet without the use of stays or 30 feet with a minimum of 2 stays between the posts.
- Drive or bury wood posts at least 24 inches into the ground. The top of the post must be at least 2 inches above the top wire. If post holes are dug, backfill by tamping the soil around the post at every 4 inches depth.

## Wire Spacing

- For cattle, use a minimum of three strands, or as specified on the plans, with the top wire at least 46” above the soil surface.
- Equally space the wires with the bottom 16 inches above the soil surface and the top wire at least 2” below the top of wooden posts or at least 1 inch below the top of steel posts. When more than four wires are used, it is not necessary to maintain equal spacing as long as top and bottom wire positions are as above and no spacing is > 12 inches.

## Fastening

- On boundary fence, attach wires to the side of the post closest receiving the most livestock pressure.
- Avoid driving staples in-line with the wood grain. Place the staple parallel to the grain then rotate in the direction away from the cut face.
- Pull tension on wire per manufacturer’s specification and firmly attach to corner, end, gate, or pull posts.

- Wires may be attached to steel posts by use of manufacturer's clips or by two turns of 14 gauge galvanized smooth wire.
- Wire should be able to move freely between the fastener and the line posts.

### 3. Items of work and construction details

Items of work to be performed in conformance with this specification and the construction details are:

#### Work Items: Fence Removal

- (1) This item shall consist of removing existing fence as shown on plan sheets and according to general notes on Sheet G-1.
- (2) Fence will be not be removed on the north, south and east sides unless necessary for construction activities.
- (3) Contractor shall flag sections of fence to be removed for Engineer approval before proceeding.
- (4) The Contractor may need to erect temporary fence for cattle control.
- (5) Fence staples shall be collected in buckets, wire rolled up and fence posts removed and stacked on site in a location designated by Owner.

#### Work Items: Fence Construction

- (1) *Impoundment Area* - This item consists of constructing and repairing perimeter fences and gates, as necessary to provide a complete perimeter fence, which are missing or were damaged or removed during construction. The perimeter fences are located at project limits and at property lines. No fences internal to the project limits will be repaired or constructed.
- (2) *Supply Canal* – This item consists of constructing and repairing fences and gates as specified on the plan at the extents of the easement for the approximately 8000' long supply canal. No fences are proposed in these locations:
  - a. Between the existing citrus grove and the supply canal
  - b. Along the south side of the east/west section of the supply canal where there is an existing fence in good condition. If the existing fence is damaged during construction the Contractor shall make repairs as needed.
  - c. On the west side of the north/south section of the supply canal and existing road

#### Work Items: Temporary Fence

- (1) Where fence is removed or where no fence exists between the proposed construction work and pastures with grazing animals the contractor shall construct a temporary fence and maintain it for the duration of the construction to confine the animals until the permanent fence is completed.

## **Construction Specification 560—Access Road**

### **1. Scope**

This item shall include all plans, specifications, and construction operations required for the installation of access roads. Construction operations shall be carried out in such a manner that erosion, air, water, and noise pollution will be minimized within legal limits as established by state regulations.

The completed job shall present a workmanlike finish.

Roads and accesses shall be planned and laid out according to the plans and approved by Engineer.

### **2. Clearing and grubbing**

All trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the area that will be required for the roadway including shoulders and ditches, and from similar areas required for side road approaches and inlet and outlet ditches. All such material will be disposed of by burning, burying at approved locations, or otherwise removed from the site and stacked. All burning shall conform to state laws and regulations. Please see CS002 Clearing and Grubbing.

### **3. Construction**

The roadbed shall be graded to the required elevations for subgrade preparation and that portion of the roadbed on which subgrade is to be prepared shall be loosed to a depth of 6 inches and all stones, roots and other objectionable material removed and disposed of. The subgrade shall then be thoroughly compacted with a pneumatic tired or vibratory roller. Soft spots discovered will be removed and replaced.

After completion of the subgrade, the base course will be placed; mixed as necessary to provide a homogeneous mixture; and thoroughly compacted, first with a vibratory roller and then with a general purpose roller. Compaction of embankment, subgrade or base course, shall be undertaken only when the soil moisture level is adequate to permit the require degree of compaction.

Fill material for roadbeds and embankments shall be deposited in thin layers (maximum of 9 inches) each layer and compacted with at least three passes of a vibratory roller.

Placement of the surface course shall be in accordance with sound highway construction practice for the surface material used.

Road shoulders and cut and fill slopes shall be graded smooth and stabilized in accordance with Florida NRCS conservation practice standard Critical Area Planting, Code 342 or Mulching, Code 484, as appropriate. Road edges and side slopes (including grass) should not be constructed in such a way that would result in ponded water on the road surface.

### **4. Shell Rock Road**

#### *Preparation*

The contractor shall complete the area to be stabilized to the lines and to a grade parallel to the finished elevation of the stabilized base before the stabilizing material is added.

#### *Spreading and compacting Select fill base material*

After the footprint of the road has been prepared, the contractor shall place maximum of 6 inch layers of Select fill. Each layer shall be compacted with at least 3 passes of a vibratory roller.

Contractor shall continue to apply layers, compacting each until the road base reaches approximately

6" below the top of the stabilized base or as shown on the plans.

#### *Stabilized base surface*

After base is completed the contractor shall shape the surface so that, after being compacted, it will conform to the lines and grades for the stabilized base as determined in the field.

#### *Spreading top layer of shell*

The contractor shall place on the completed stabilized base described above layers of shellrock to the loose depth not exceeding 6 inches per layer.

#### *Compacting and finishing base*

After each layer spreading operations are complete, the contractor shall compact the shellrock base by rolling at least three passes with a vibratory roller. The material being compacted shall be maintained within plus or minus 2 percent of its optimum moisture content during compaction. Additional layers of shellrock shall be added in layers as specified above until the final road surface elevations and shell rock thickness is achieved.

### **5. Maintenance Access**

Contractor shall clear and not necessarily grub (see spraying and disking option in CS023, Foundation preparation) the footprint for the maintenance access located alongside the seepage ditch, between the fence and the seepage ditch in the impoundment area, and approximately 15' along both sides of the water supply canal in the Channel B improvements area, as shown on the drawings. The mentioned access shall be constructed by excavating and/or filling as needed, meeting the requirements specified in the respective sections (CS021 and CS023). Class C compaction is required for the maintenance access. Contractor shall grade to the specified elevations and prepare top layer to be grassed. Maintenance access is intended to be driven on for maintenance purposes only.

### **6. Measurement and payment**

Compensation for any item of work described in the contract, but not listed in the bid schedule, will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 5.

All payments to contractors will be made in accordance to the terms of the contract between the Owner and the Contractor.

### **7. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details are:

#### Work Items: Access Roads

- (1) This item is consist of construction the following access roads:
  - a. Primary shell rock access road along east bank of Channel A, approximately 6,240' long
  - b. Shell rock access road to pump station
  - c. Select fill perimeter road around toe of impoundment berm
  - d. Maintenance accesses

## **Construction Specification 587 – Aluminum Structure for Water Control**

### **1. Scope**

The work shall consist of all construction operations and furnishing materials required by design, drawings, and specifications for the complete installation of the work.

### **2. Location**

The location of the structures shall be as shown on the drawings or as staked in the field.

### **3. Site and foundation preparation**

Areas to be excavated and areas to be occupied by earthen embankments shall be cleared of trees, brush, tall standing vegetation, and other debris, unless otherwise specified. Objectionable materials encountered shall be removed, burned, buried, or otherwise disposed of as specified or approved by the Engineer. It will be the responsibility of the Contractor (installer) to obtain the necessary permits for burning debris.

The foundation will be firm soil material. Any areas of muck, or other soft, unstable materials will be excavated and replaced with stable, earthfill material. Surface and ground water will be removed and diverted as needed to perform the required construction in accordance with plans and specifications. Removal of water shall be accomplished in such a manner that erosion and the transmission of sediment and other pollutants are minimized and kept within legal limits. (see specification CS011)

### **4. Pipe conduit installation**

Pipe materials shall conform to the requirements specified on the plans, drawings, or as designated in the construction details. All appurtenances shall be of materials compatible with the pipe. Standard band couplers are satisfactory unless otherwise specified.

Special treatment shall be provided to pipe embedded in or attached to concrete when the pipe is aluminum or aluminum-coated and aluminum-zinc alloy-coated. Potential contact surfaces shall be insulated. All aluminum, aluminum-coated, and aluminum-zinc alloy-coated pipe surfaces in contact with concrete and masonry surfaces shall be coated with two coats of a bituminous paint of the cut-back type. Placement of the pipe shall be such that direct metal-to-metal contact with other metallic materials, such as embedded steel reinforcement or water control gates, is prevented.

The pipe shall be laid to the line and grade shown on the drawings or as staked in the field. It shall be firmly and uniformly bedded throughout its entire line. It shall be loaded sufficiently during backfilling around the sides to prevent being lifted from the bedding. Heavy equipment will not be allowed over the pipe conduit until the backfill has been placed above the top surface of the structure to one-half the clear span width of the structure or 2 feet, whichever is greater.

Selected backfill material shall be placed around the conduit in layers not more than 6 inches before compaction for all structures.

See CS023 for compaction and testing requirements.

### **5. Earthfill placement**

The completed works shall conform to the lines, grades, and elevations shown on the design, drawings, or as staked in the field within tolerances as specified on the plans.

Construction equipment shall be operated so the entire surface is traversed by not less than one tread track. The moisture content of fill material shall be adequate for obtaining the required

compaction. Backfill adjacent to and on top of the structure shall be compacted by hand with at least three passes of a vibratory compactor.

The material placed in the fill shall be free of detrimental amounts of manure, sod, roots, stones more than 6 inches in diameter, and other objectionable material.

## **6. Pollution and workmanship**

Construction operations shall be carried out so that erosion and air and water pollution are minimized and held within legal limits. All work shall be conducted in a safe, skillful, and workman-like manner.

## **7. Protection**

A protective cover of vegetation shall be established on all exposed, sloping surfaces of the embankment. Seedbed preparation, seeding, fertilizing, mulching, sodding, and other needs shall be designated on the drawings and the Natural Resource Conservation Services' Construction Specification for Vegetative Cover.

## **8. Basis of acceptance**

The Engineer will be notified during normal working hours on the day prior to initiating construction with additional notices designated in the construction details. Failure to notify the Engineer so that there is an opportunity to inspect the work may result in the Engineer not being able to certify that the job will meet standards and specifications.

The acceptability of the structure shall be determined by inspections to check compliance with the provisions of the plan, drawings, and this specification with respect to the design of pipe conduit, materials specified, the appurtenances, earthfill placement, and the minimum installation requirements.

## **9. Measurement and payment**

Compensation for any item of work described in the contract, but not listed in the bid schedule, will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 5.

All payments to contractors will be made in accordance to the terms of the contract between the Owner and the Contractor.

## **10. Work Items**

### Work Items: Aluminum Water Control Structures

- (1) Channel A connection riser CS-1
- (2) Supply canal connection risers CS-2 through CS-8
- (3) Pump relocation riser CS-9



## **Construction Specification 761—Rock Riprap**

### **1. Scope**

The work shall consist of the construction of rock riprap revetments and blankets, including filter or bedding where specified.

### **2. Material**

Rock for loose rock riprap shall conform to the requirements of Section 814, Riprap Materials, of the latest edition of the Florida Department of Transportation Standard Specifications 2010 for Riprap, Section 530. Gradation shall be as specified in Section 7. Rock for pump discharge energy dissipation shall be at least 18" in diameter. Prior to delivery of rock, the contractor shall designate in writing the source from which he intends to obtain the rock and information satisfactory to the company that the material meets the requirements of the contract. The contractor shall provide the engineer and the company free access to the source for the purpose of obtaining samples for testing.

### **3. Subgrade preparation**

The subgrade surface on which the rock riprap, filter, bedding, or geotextile is to be placed shall be cut or filled and graded to the lines and grades shown on the drawings. When fill to subgrade lines is required, it shall consist of approved material and shall conform to the requirements of the specified class of earthfill. Rock riprap, filter, bedding, or geotextile shall not be placed until the foundation preparation is completed and the subgrade surface has been inspected and approved.

### **4. Equipment-placed rock riprap**

The rock riprap shall be placed by equipment on the surface and to the depth specified. It shall be installed to the full course thickness in one operation and in such a manner as to avoid serious displacement of the underlying material. The rock for riprap shall be delivered and placed in a manner that ensures the riprap in place is reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks and spalls filling the voids between the larger rocks. Some hand-placing may be required to provide a neat and uniform surface. Rock riprap shall be placed in a manner to prevent damage to structures. Hand-placing is required as necessary to prevent damage to any new and existing structures.

### **5. Filter or bedding**

The designated material shall be placed on the prepared subgrade surface of geotextile fabric as specified. Compaction of filter or bedding aggregate is not required, but the surface of such material shall be finished reasonably smooth and free of mounds, dips, or windrows.

### **6. Measurement and payment**

For items of work for which specific unit prices are established in the contract, the quantity of each type of rock riprap placed within the specified limits is computed to the nearest ton by actual weight. The volume of each type of filter or bedding aggregate is measured within the specified limits and computed to the nearest cubic yard by the method of average cross-sectional end areas. For each load of rock riprap placed as specified, the contractor shall furnish to the company a statement-of-delivery ticket showing the weight to the nearest 0.1 ton.

Payment is made at the contract unit price for each type of rock riprap, filter, or bedding. Such payment is considered full compensation for completion of the work. Total payments will not exceed lump sum amount of the contract for this task.

*All methods*—The following provision applies to all methods of measurement and payment. Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the item of work to which it is made subsidiary.

All payments to contractors will be made in accordance to the terms of the contract between the company and the contractor.

## **7. Items of work and construction details**

Items of work to be performed in conformance with this specification and the construction details are:

### Bid Item: Loose Rock Riprap

- (1) This item shall consist of furnishing and installing rock riprap required for ditch and side slope stabilization as shown on the plans.
- (2) Riprap may be carefully placed by machine to fill voids and provide uniformity. Hand-placement of the rock may will be required adjacent to the pipes and structures. A layer of geotextile shall be installed under all rock riprap.
- (3) Riprap shall conform to the requirements set for the in the Florida Department of Transportation 2010 Standard Specification Guide for Rubble (Bank and Shore Protection), Section 530.2.2.1.

## **Construction Specification 2343—Geotextile Stabilization and Separation**

### **1. General**

Separation Geotextile (Subgrade CBR  $\geq$  3):

1. This section is applicable to the use of a geotextile to prevent mixing of subgrade soil and an aggregate cover material (subbase, base, select fill, etc.).
2. This section may also apply to situations other than beneath pavements where separation of two dissimilar materials is required, but where water seepage through the geotextile is not a critical function.

Stabilization Geotextile ( $1 < \text{Subgrade CBR} < 3$ ):

1. This section is applicable to the use of a geotextile in wet, saturated conditions to provide the coincident functions of separation and filtration. In some installations, the geotextile may also provide reinforcement.

### **2. References**

- A. American Association of State Highway and Transportation Officials (AASHTO)  
“Standard Specification for Geotextile Specification for Highway Applications”  
Designation M 288-05
- B. AASHTO Test Standards:
  1. T 88 – Standard Test Method for Particle Size Analysis of Soils
  2. T 90 – Standard Test Method for Determining the Plastic Limit and Plasticity Index of Soils
  3. T 99 – Standard Practice for Determination of the Moisture Density Relations of Soils Using a 5.5 lb hammer and 12 in drop (Standard Proctor)
- C. American Society for Testing and Materials (ASTM):
  1. D 123 – Standard Terminology Relating to Geotextiles
  2. D 276 – Standard Test Method for Identification of Fibers in Textiles
  3. D 3786 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics.
  4. D 4354 - Practice for Sampling of Geosynthetics for Testing.
  5. D 4355 - Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
  6. D 4439 - Terminology for Geotextiles.
  7. D 4491 - Test Methods for Water Permeability of Geotextiles by Permittivity.
  8. D 4533 - Test Method for Index Trapezoid Tearing Strength of Geotextiles.
  9. D 4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.
  10. D 4759 - Practice for Determining the Specification Conformance of Geosynthetics.
  11. D 4751 - Test Method for Determining Apparent Opening Size of a Geotextile.

12. D 4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

13. D 4873 - Guide for Identification, Storage, and Handling of Geotextiles.

D. Federal Highway Administration (FHWA) - Geosynthetic Design and Construction Guidelines, Publication No. FHWA HI-95-038, May 1995.

E. Geosynthetic Accreditation Institute - Laboratory Accreditation Program (GAI-LAP).

### **3. Definitions**

California Bearing Ratio (CBR): The ratio of (1) the force per unit area required to penetrate a soil mass with a 19 sq cm (3 sq in) circular piston (approximately 51 mm (2 in) diameter) at the rate of 1.3 mm / min (.05 in/min). To (2) that required for corresponding penetration of a standard material.

Minimum Average Roll Value (MARV): Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

Typical Roll Value: Property value calculated from average or mean obtained from test data.

### **4. Submittal**

Certification:

1. The Contractor shall provide the Owner a certificate stating the name of the geotextile manufacturer, product name, style, chemical compositions of filaments or yarns and other pertinent information to fully describe the geotextile.
2. The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. Documentation describing the quality control program shall be made available upon request.
3. The manufacturer's certificate shall state that the furnished geotextile meets MARV requirements of the specification as evaluated under the manufacturer's quality control program. The certificate shall be attested to by a person having legal authority to bind the Manufacturer.

Manufacturing Quality Control (MQC) test results shall be provided upon request.

### **5. Delivery, storage, and handling**

Geotextile labeling, shipment and storage shall follow ASTM D 4873.

Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

Each shipping document shall include a notation certifying that the material is in accordance with the manufacturer's certificate.

Each geotextile roll shall be wrapped with a material that will protect the geotextile from damage due to shipment, water, sunlight, and contaminants.

The protective wrapping shall be maintained during periods of shipment and storage. If the wrapping is damaged prior to installation, the outer wrap of geotextile material must be

discarded before installation.

During storage, geotextile rolls shall be elevated off the ground and adequately covered to protect them from the following: Site construction damage, extended exposure to ultraviolet (UV) radiation, precipitation, chemicals that are strong acids or strong bases, flames, sparks, temperatures in excess of 71 deg C (160 deg F) and any other environmental condition that might damage the geotextile.

## **5. Quality assurance sampling, testing, and acceptance**

Geotextile:

1. Geotextiles shall be subject to sampling and testing to verify conformance with this specification. Sampling for testing shall be in accordance with ASTM D 4354.
2. Acceptance shall be in accordance with ASTM D 4759 based on testing of either conformance samples obtained using Procedure A of ASTM D 4354, or based on manufacturer's certifications and testing of quality control samples obtained using Procedure B of ASTM D 4354.

Sewn Seams (if required):

1. For seams that are to be sewn in the field, the Contractor shall provide at least a 2 meter (6 ft) length of sewn seam for sampling by the Owner before the geotextile is installed.
2. For seams that are sewn in the factory, the Owner shall obtain samples of the factory seams at random from a roll of geotextile that is to be used on the project.
3. If seams are to be sewn in both directions, samples of seams from both directions shall be provided.
4. For seams that are field sewn, the seams sewn for sampling shall be sewn using the same equipment and procedures as will be used for the production seams.
5. The seam assembly description shall be submitted by the Contractor along with the sample of the seam. The description shall include the seam type, sewing thread, and stitch density.

## **6. Products**

Manufacturers:

- A. Propex Inc., Chattanooga, Tennessee, 37422 USA, Phone (800) 621-1273.
- B. Us Fabrics, Cincinnati, Ohio 45227 Phone (800)518-2290
- C. Substitutions: Equivalent fabrics will be considered with appropriate submittals.

Equivalent Products by Manufacturer				
US Fabrics	Mirafi	Carthage Mills	Amoco (Propex)	Thrace
US 150	-	FX-44	2000	GTF 200F
US 200	500 X	FX-55	2002	GTF 200
US 250	550 X	FX-60	2004	GTF 250
US 315	600 X	FX-66	2006	GTF 300
US 4800	HP 570	FX-400MF	2044	GTF 570

*Materials*

Example Material	Properties of Woven Geotextile								
	Tensile Strength	Elongation @ Break	Mullen Burst	Puncture Strength	CBR Puncture	Trapezoid Tear	Apparent Opening	Permittivity	Water Flow Rate
US Fabrics	lbs	%	psi	lbs	lbs	lbs	US Sieve	Sec <sup>-1</sup>	g/min/sf
US 150	135	12	325	65	380	55	30	0.05	4
US 200	200	15	400	90	700	75	50	0.05	5
US 250	250	15	450	100	500	90	40	0.05	4
US 315	315	15	600	120	100	120	40	0.05	4
US 4800	600 x 550	20 x 15	1350	230	1400	230 x 200	80	0.145	15

A. Geotextile:

1. The geotextile construction shall be woven slit film polypropylene geotextile; individual slit films woven together in manner to provide dimensional stability relative to each other including selvages.
2. Resistant to UV degradation and biological and chemical environments normally encountered in soils.
3. Minimum Average Roll Values for Type III (AASHTO Class 1) (US 315) woven geotextile for paved urban roads where subgrade has a CBR of 1 to 3 and when the intended use is heavy duty haul roads and runways:

Property	Test Method	Units	Property Requirement
Grab Tensile Strength	ASTM D 4632	N (lbs)	1400 (315)
Grab Elongation	ASTM D 4632	Percent	15
Puncture Strength	ASTM D 4833	N (lbs)	667 (150)
Mullen Burst	ASTM D 3786	kPa (psi)	4650 (675)
Trapezoidal Tear	ASTM D 4533	N (lbs)	533 (120)
Apparent Opening Size	ASTM D 4751	mm (US Std. Sieve)	0.425 (40)
Permittivity	ASTM D 4491	Sec-1	0.05
Water Flow Rate	ASTM D 4491	l/min/m <sup>2</sup> (gpm/ft <sup>2</sup> )	160 (4)
UV Resistance (percent retained at 500 hours)	ASTM D 4355	Percent	70

### *Quality Control*

Manufacturing Quality Control (MQC): Testing shall be performed at a laboratory accredited by GAI-LAP for tests required for the geotextile, at frequency exceeding ASTM D 4354.

Sewing Thread (if required)

1. Sewing thread shall consist of high strength polypropylene or polyester (Nylon shall not be used).
2. The thread shall be of a contrasting color to the geotextile.

## **6. Execution**

### *Preparation*

Clear, grub, and excavate/fill installation site to design grade. Remove topsoil, vegetation, and other unsuitable materials.

Soft spots and unsuitable areas shall be identified during site preparation or subsequent proof rolling. These areas shall be excavated and backfilled with select materials and compacted using normal procedures.

### *Installation*

The geotextile shall be laid smooth without wrinkles or folds on the prepared subgrade in the direction of construction traffic.

Adjacent geotextiles rolls shall be overlapped, sewn or joined as required below:

<b>Subgrade CBR</b>	<b>Minimum Overlap</b>
Greater than 3	300 - 450 mm (12 - 18 in)
1 – 3	600 - 1000 mm (24 - 36 in)
0.5 – 1	1000 mm (36 in) or sewn
Less than 0.5	Sewn
All roll ends	1000 mm (36 in) or sewn

When sewn seams are required, the seam strength, as measured by ASTM D4632 shall be equal to or greater than 90 percent of the specified grab strength.

On curves, the geotextile may be folded or cut to conform to the curves. The fold or overlap shall be in the direction of construction and held in place by pins, staples, or piles of fill or rock.

Prior to covering, the geotextile shall be inspected by a certified inspector of the Owner to ensure that it has not been damaged during installation.

Damaged areas, as identified by the Owner, shall be repaired immediately by covering the damaged area with a geotextile patch that extends an amount equal to the required overlap beyond the damaged area.

The subbase shall be placed by end dumping onto the geotextile, or over previously placed subbase aggregate such that at least the minimum specified lift thickness shall be between the construction equipment tires or tracks and the geotextile at all times.

Pretensioning Geotextile:

1. Proof roll with heavily loaded, rubber-tired vehicle. Wheel load of truck shall be equivalent to maximum expected for site. Vehicle to make at least four passes over first lift in each area of site.
2. Once design aggregate has been placed, use roadway prior to paving to prestress geotextile-aggregate system in key areas.

If required, staple or pin geotextile at overlaps to maintain position during construction activities. Use 250 to 300 mm (10 to 12 in) long nails placed at minimum 15 m (50 ft) on center for parallel rolls and 1.5 m (5 ft) on center for roll ends.

Do not place overlaps along anticipated primary wheel path locations. Place overlaps at end of rolls in direction of aggregate placement with previous roll on top.

When geotextile intersects an existing pavement area, extend geotextile to edge of old system. For widening or intersecting existing roads where geotextiles have been used, anchor geotextile at roadway edge.



Compact first lift of base aggregate with a tracking dozer and then compact with smooth-drum vibratory roller to obtain minimum compacted density.

Compaction of permeable bases shall meet specified requirements.

Perform construction parallel to road alignment.

Fill ruts formed during construction to maintain adequate cover over geotextile. Do not blade ruts down.

Place remaining base aggregate in lifts not exceeding 250 mm (10 in) in loose thickness and compact to specified density.

#### *Protection*

Atmospheric exposure of the geotextile to the elements following laydown shall be limited to 14 days to prevent damage.

Equipment may operate on roadway without aggregate for geotextile installation under permeable bases if subgrade is of sufficient strength.

1. For extremely soft soils, use lightweight construction vehicles for access on first lift.
2. Limit construction vehicles in size and weight to limit rutting in initial lift to 75 mm (3 in).
3. If rut depths exceed 75 mm (3 in), decrease construction vehicle size or weight or increase lift thickness.

Turning not permitted on first lift of base aggregate. Construct turnouts at roadway edge to facilitate construction.

#### *Items of work and construction details*

Items of work to be performed in conformance with this specification and the construction details are:

1. Optional Geotextile fabric integration into primary and secondary road bases using US Fabrics US 200 or equivalent.
2. Geotextile fabric under rip-rap using US Fabrics US350 or equivalent.

## **Construction Specification 11200 – Stormwater Pumps**

### **1. Scope**

This specification covers the design, supply and delivery of two (2) Axial Flow Pumps, drivers and accessories designed specifically for agricultural water handling applications. Contractor shall select and coordinate his work with qualified pump manufacturer as described below. The Contractor shall be responsible for the performance and quality of the completed pump station.

Owner/Engineer will not be responsible for any discrepancies or deficiencies in the final pump station due to misunderstanding, poor communication or lack of coordination between the pump manufacturer and Contractor.

### **2. Qualifications**

The pump manufacturer shall be responsible for the proper design of the axial flow pump as defined in the contract drawings and specifications. The manufacturer shall be regularly engaged in the production of axial flow pumps and related equipment and shall be responsible for the fabrication and assembly of the pump unit. The manufacturer shall have experience with the design and manufacture of large diameter axial flow pumping systems, similar to that specified herein and shown on the contract drawings.

### **3. Performance test**

Each pump shall be tested after installation under normal operating conditions. This test shall be conducted under the guidance of a Florida Registered Professional Engineer. A written detail testing plan shall be submitted for review by the Purchaser. The supplier shall provide four signed and sealed reports to the Engineer. The report shall develop: capacity (gpm) vs. head (ft) and performance curves. The report shall meet the requirements of SFWMD's Everglades Best Management Practices Permit Program "Flow Calibration Guidelines" dated October 1996, and as amended.

### **4. Operating conditions**

The table provided on the design plans provided the proposed performance of the drainage pumps. It is the responsibility of the pump supplier to ensure that the pumps perform properly as specified, and if any modifications are required they are submitted to the Engineer in writing for approval.

See design plans pump location, pump performance, critical elevations and installation details. Contractor and pump manufacturer shall be responsible to provide a complete pump station which meets the pump rate and elevations requirements stated in the above table and with good workmanship and coordination between the two entities. Small changes by the pump manufacturer to the pump station design presented on the plans are expected to optimize the installation for the pumps supplied. Changes proposed should be submitted to Engineer in shop drawings for approval. The Engineer suggests a preconstruction meeting should be schedule with the Engineer, Contractor and Pump Manufacturer in attendance to review proposed plan for implementation of the drainage pump station.

The pumps performance shall be non-overloading for the design H.P. of the furnished driver. Driver and related components shall have not less than a 1.15 S.F.

## 5. Submittals

Submittals shall include documentation, shop drawings, and calculations but not be limited to, the following:

- A. Guaranteed standard performance curves for each pump furnished.
- B. Total developed head.
- C. Efficiency.
- D. Required brake horsepower at the bowl.
- E. Minimum recommended submergence.
- F. Mechanical details showing entire pump assembly, reduction gear, drive shaft, and couplings.
- G. Layout, dimensional and cross-section drawings
- H. Materials of construction
- I. Coating system data
- J. Nameplate data
- K. Power Unit manufacture and model if applicable
- L. Motor manufacturer and model number
- M. Shop drawings for proposed steps and hand rails which meet OSHA standards showing dimensions, materials, mounting methods, joint types, fasters and coatings.

## 6. Products

**Materials** - Materials not specifically described shall conform to the latest approved industry standard(s) covering appropriate class or types of materials. Material types used in the manufacture of the pumps shall conform to the following:

<u>COMPONENT</u>	<u>MATERIAL TYPE</u>	<u>SPECIFICATION</u>
Mounting Plate	HR Steel	ASTM A-36
Column & Elbow	HR Steel	ASTM A-588
Steel Plate	HR Steel	ASTM A-588
Cold Rolled Steel Bars	CR Steel	AISI/A-1018
Hot Rolled Steel Bars	HR Steel	ASTM A-36
Stainless Steel Plate	STS Steel	ASTM 304
Pipe	Schedule 80	A-53
Pump Shafting	CR Steel	ASTM A-1018
Intake Bell	HR Steel	ASTM A-588
Bearings	Bronze	ASTM B 62 or SAE 660

A-242 Carbon Steel shall be acceptable in place of A-588 where called for in specifications. All materials specification are a minimum, the Purchaser may accept equal or better substitutes at their sole discretion.

## 7. Pump construction

The two (2) pumps shall be of the same type with similar components and mounting.

- A. Pump/Diffuser Bowl – The Intake Bell shall be made of ASTM A-588 steel plate, and shall be flanged for mating to the propeller wear band. Intake Bell diameter shall be no less than 1-1/2 times the impeller diameter. It shall be supported entirely by the propeller casing. It shall contain a guide hub and vanes to support a water lubricated tail bearing. The propeller wear band shall be made of ASTM A-304 or A-316 stainless steel, and shall be flanged for mating to the suction bell. It shall be machined to provide a close running tolerance to the propeller. This unit may be combined with the diffuser bowl to form a single unit. The diffuser bowl shall be made of ASTM A-588 steel plate. It shall contain a tapered diffuser cone and straightening vanes. It shall be welded as one piece with the propeller casing.
- B. Propeller – The propeller and hub shall be cast, or manufactured entirely from 316 L stainless steel or bronze. The propeller blades shall be ground and polished for maximum hydraulic efficiency. For manufactured propellers with welded blades, blades shall be chamfered on both sides for full penetration welding. The periphery of the blades shall be machined for a close running fit with the impeller bowl. The complete propeller shall be properly balanced after manufacturing. The propeller shall be attached to the shaft in such a manner as to ease assembly and disassembly.
- C. Pump Column and Discharge Elbow - The pump column and discharge elbow shall be made of ASTM A-588 plate. The elbow shall be of long radius, with the centerline radius not less than one times the nominal pipe diameter.
- D. Horizontal Discharge Pipe – Size as specified on plans A-53 steel pipe.
- E. Flap Gate - Each horizontal buried discharge pipe shall include a flange-mounted flap gate at the discharge end. Flap gates shall be Hydro Gate cast iron Model 50C Round Opening Heavy Duty Flap Gate or equal. Hinges shall be fitted with grease fittings fabricated so that greasing can be performed safely without walking on top of the discharge pipe to access the flap gate hinges.
- F. Pump Shaft – The pump line shaft shall be cold rolled steel, conforming to ASTM A-108 or A-1018. It shall be sized to safely transmit the horsepower required, and to prevent vibration.
- G. Line Shaft Enclosure – The shaft enclosing tube shall be made of ASTM A53, Schedule 80 seamless pipe or DOM tubing, of a size to accommodate the pump line shaft and its supporting bearings.
- H. Bearings – Fluted bronze sleeve bearings shall be provided in the Line Shaft Enclosure tube. Bearings shall be in alignment inside the tube, spaced less than 60” apart. Bearings shall be lubricated with grease (NO OIL) from the top of the tube by means of steel grease fittings. Grease addition will be made through remote greasing lines.

- I. Pump Mounting Plate – The pump mounting plate shall be made of ASTM A36 Steel. It shall be of adequate thickness and strength to prevent excessive vibration and deflection. The mounting plate shall have mounting holes for anchoring the pump assembly.
- J. Lifting Lugs – Major pump components weighing 100 pounds or greater shall be furnished with lifting lugs to facilitate handling, and designed and arranged to allow safe handling of pump components singly or collectively as required during shipping, installation, and maintenance.
- K. Nuts and Bolts – Bolts used in assembling pump and its supporting members shall be grade 5 zinc plated coarse thread. Only hexagonal bolts and nuts shall be used.
- L. Name Plate – A corrosion resistant, metal nameplate shall be furnished stating the manufacturer's name and address, pump serial number, design RPM, rated gallons per minute capacity. The nameplate shall be located in a readily visible location and suitably attached to the pump.
- M. Hardware – All machine bolts, nuts and cap screws shall be hex head type. Hardware and parts requiring special tool shall not be used.
- N. Welding – Pump and pipe welding shall be continuous and full penetration inside and out. All slag shall be removed and undercutting shall not exceed 15% of the material thickness.
- O. Electric Motors – Motors shall be vertically mounted on the pump by the pump manufacturer. Motors shall be 208-230V/460V, 3 Phase, 60 HZ, TEFC, T Frame. Motor manufacturer shall be Baldor, US, General Electric, or some other well recognized brand with local support and repair stations.
- P. Drive System - The motor will be connected to the pump through a V Belt drive system. The belts shall be sufficient to convey the motor HP to the pump with at least 20% safety margin. The motor mounting shall be easily field adjusted to provide proper belt tension. Moving belts, shafts and drive components shall be shielded per OSHA standards to prevent accidental access and injury.
- Q. Staff Gages – as specified and located on plans and shall be installed in convenient place for the operators of the pump and sluice gate stations to view gradations.
- R. Painting – Pump interiors and exteriors shall be painted with the manufacturers paint system, or as specified. As a minimum, the pump shall be coated with bitumastic enamel equal to Zophar Tripal A coal tar enamel (minimum 6 mils), or as an option sandblasted to paint manufacturers specifications with two (2) coats (minimum 6 mils) of a high solids epoxy paint system similar to Ameron Amerlock 400 and Amercoat 450 or approved equal. Alternate paint systems are acceptable provided that the pump manufacturer can demonstrate corrosion resistance equal to the high solids epoxy system.
- S. Inspection – Contractor shall arrange for the inspection by the Engineer of the pump parts and related accessories and appurtenances during manufacturing to assure compliance with these specifications. The Engineer or his representative shall have the option of witnessing the pump performance testing.

## 8. Operation and Maintenance Manual

Contractor shall submit installation, operation and maintenance manuals (IOM Manuals) containing complete information on installation, operation, lubrication, adjustment, routine and special maintenance, disassembly, repair, reassembly, and trouble diagnosis of the pump and its auxiliary units.

## 9. Warranty

As specified in the General Conditions.

## 10. Delivery

Contractor shall coordinate the timely delivery of the pump station equipment to the job site. Handling and storage of equipment will as recommended by the manufacturer to prevent any damage or loss. Contractor shall remain responsible for the loss mitigation, safe storage, and handling of the pump station until final acceptance by the Engineer. Any loss or damage shall be repaired or replaced by the Contractor at no cost to the Owner.

## 11. Quality assurance

- A. Equipment and Material incorporated into the Work - Provide products that comply with the requirements of the contract documents, undamaged, and unless otherwise indicated, unused at the time of installation. Provide products that are complete with all accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and for the intended use and effect.
- B. Standard Products - Where they are available and comply with Specifications, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- C. Continued Availability - Where, because of the nature of its application, the Owner is likely to need replacement parts or additional amounts of a product at a later date, either for maintenance and repair or replacement, provide standard products for which the manufacturer has published assurances that the products and its parts are likely to be available to the Owner at a later date.
- D. Conform to applicable Specifications, codes, standards, and regulatory agencies.
- E. Comply with size, make, type, and quality specified or as specifically approved in writing by the Engineer.
- F. Manufactured and fabricated products:
  1. Design, fabricate, and assemble in accordance with the best engineering and shop practices.
  2. Manufacture like parts of duplicate units to standard sizes and gauges to be interchangeable.
  3. Equipment and Materials shall be suitable for service conditions intended.
  4. Equipment capacities, sizes, and dimensions indicated or specified shall be adhered to unless variations are specifically approved in writing.

5. Two or more items of the same kind shall be identical and supplied by the same manufacturer.
- G. Do not use Equipment and Material for any purpose other than that for which it is designed or is specified.
- H. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
- I. Identification: Each item of equipment shall have permanently affixed to it a label or tag with its equipment serial number, model number, performance information, and manufacturer's name.

## 12. Preparation for storage

Though all Equipment and Material shall be crated, packed, palletized, assembled and protected for transportation and immediate installation at the delivery site, Equipment and Material shall nevertheless be crated, packed and protected for storage for an extended period of time, which protection shall include, but not be limited to:

- A. Protection of motors, electrical equipment and machinery of all kinds against corrosion, moisture deteriorations, mechanical injury, and accumulation of dirt or other foreign matter.
- B. Protection of exposed-machined surfaces and unpainted iron and steel, as necessary, with suitable rust-preventive compounds.
- C. Protection of bearings and similar items with grease packing or oil lubrication.

## 16. Training

- A. On-Site Training – The pump and controls manufacturers shall provide on-site training of the Owner's personnel. The training sessions shall be conducted by qualified, experienced, factory-trained representatives. Training shall include instruction in operation, care and maintenance of the Equipment.
- B. Training Plan – The Contractor shall submit a training plan to the Engineer no less than two (2) weeks prior to the training session. Contractor's training plan shall include, but not necessarily be limited to, training manual, handouts, visual aids, and other reference materials as appropriate to the nature of the Equipment. The training plan shall be suitably bound for proper organization and easy reproduction. Seller shall furnish up to ten copies, as required by Owner, of the training plan at least two (2) weeks prior to each training session.
- C. Format and Content: Each training session shall be comprised of time spent at the specific location of the subject equipment or system but if approved, a classroom setting may be used to review documentation. As a minimum, training session shall cover the following subjects for each item of equipment or system:
  1. Familiarization
    - a. Review catalog, parts lists, drawings, etc., which have been previously provided for the plant files and operation and maintenance manuals.
    - b. Check out the installation of the specific equipment items.
    - c. Demonstrate the unit and indicate how all parts of the specifications are met.

- d. Answer questions.
- 2. Safety
  - a. Using material previously provided, review safety references.
  - b. Discuss proper precautions and procedures related to the Equipment.
- 3. Operation
  - a. Using material previously provided, review reference literature.
  - b. Explain the operating theory of the Equipment
  - c. Explain all modes of operation, including start-up, normal operation, normal shutdown, emergency operating and emergency shutdown and restart, including a discussion on system integration and electrical interlocks, if any.
  - d. Check out Owner's personnel on proper use of the Equipment. As a minimum, hands-on Equipment training for operations personnel will include:
    - 1. Identify location of Equipment and Equipment components
    - 2. Identifying piping and flow options.
    - 3. Identifying valves and their purpose.
    - 4. Identifying instrumentation:
      - a. Location of primary element.
      - b. Location of instrument readout.
      - c. Discuss purpose, basic operation, and information interpretation.
    - 5. Demonstrate and perform standard operating procedures.
    - 6. Discuss and perform the preventative maintenance activities.
    - 7. Discuss and perform start-up and shut-down procedures.
    - 8. Perform the required equipment exercise procedures.
    - 9. Perform routine disassembly and assembly of equipment, if applicable.
    - 10. Identify and review safety items and perform safety procedures, if feasible
- 4. Preventive Maintenance - Using material previously provided, review preventive maintenance (PM) lists including:
  - a. Reference material.
  - b. Daily, weekly, monthly, quarterly, semiannual, and annual PM jobs.
  - c. Show how to perform PM jobs.
  - d. Show Purchaser's personnel what to look for as indicators of equipment problems.
  - e. Routine preventative maintenance, including specific details on belts, seals, bearing replacement, lubrication, normal maintenance and maintenance of corrosion



protection of the Equipment and ancillary components, replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.

- f. Required Equipment exercise procedures and intervals.
  - g. Routine and long-term calibration procedures
  - h. Routine disassembly and assembly of equipment, if applicable, for purposes such as operator inspection of equipment.
  - i. Equipment inspection and troubleshooting procedures, including the use of applicable test instruments and the "pass" and "no pass" test instrument readings.
5. Corrective Maintenance
- a. List possible problems.
  - b. Discuss repairs and point out special problems.
  - c. Open equipment and demonstrate procedures, where practical.
  - d. Operator detection, without test instruments, of specific equipment trouble symptoms.
6. Parts
- a. Show how to use previously provided parts list and order parts.
  - b. Check over spare parts on hand. Make recommendations regarding additional parts that should be available.
7. Local Representatives
- a. Where to order parts: Name, address, telephone.
  - b. Service problems:
    - 1. Who to call.
    - 2. How to get emergency help.
8. Operation and Maintenance Manuals
- a. Review any other material submitted.
  - b. Update material, as required.
- D. Video Recording: Purchaser may, at its option, provide video or digital recordings to aid in the training sessions.

## **Construction Specification 11210 – Stormwater Pump Relocation**

### **1. Scope**

This specification covers the relocation of one (1) Axial Flow Pump Station including drivers and accessories designed specifically for agricultural water handling applications. Contractor shall select and coordinate his work with qualified pump manufacturer as described below. The Contractor shall be responsible for the performance and quality of the completed pump station.

Owner/Engineer will not be responsible for any discrepancies or deficiencies in the final pump station due to misunderstanding, poor communication or lack of coordination between the pump manufacturer and Contractor.

### **2. Qualifications**

The Contractor shall be responsible for the proper implementation of the removal and relocation of one (1) existing 24” axial flow pump manufactured by Creel Pump, Inc. The Contractor may contract with Creel Pump or another similarly qualified entity who is regularly engaged in the production, repair and installation of axial flow pumps and related equipment who shall be responsible for the overall project of relocating the pump station. Contractor shall submit qualifications of the company selected to coordinate the relocation and repair of the pump station to Engineer for approval.

### **3. Pump Removal**

The Contractor shall coordinate with Highlands County and the owner of the existing 24” axial flow pump to schedule a date when the pump can be disabled for sufficient time to allow it to be updated and relocated. No work shall commence without the knowledge and approval of the pump owner. The pump station is currently in use therefore the work must be completed as expeditiously as possible without impacting the owner’s drainage operations. The pump station shall be removed entirely and relocated approximately 850’ north as shown on the plans. Any damage caused by the Contractor to the exiting pump station or its components during removal shall be his responsibility to repair or replace. Contractor is cautioned to avoid spills of fuel or petroleum products when removing the diesel engine and fuel tank.

### **4. Repair of Existing Pump**

The existing pump will be removed and relocated per design plans and agreement with its owner. To ensure that the pump performs as originally designed and has a long service life some repairs and upgrades to the pump shall be included in this scope of work. All pump work shall be completed by the original manufacturer of the pump or an approved equal and shall include at a minimum the following items:

- Replace all bolts, nuts and other fasteners removed during the moving process
- New gear head shaft
- New split coupling
- New 4 bolt flange bearing
- New pump shaft with hard coating on seals surface
- New oil seals

- New bottom bronze oil bearing
- New Duramax marine bearing
- Sand blast and epoxy (coal tar equivalent) coating
- All steel parts to be installed must be primed and painted with rust resistant paint
- New fuel hoses and clamps

## **5. Pump Installation**

The intent for this scope of work is to relocate the existing pump to a new station location that meets or exceeds the current functionality, quality of workmanship, materials and safety. The replacement station shall have safety equipment upgraded to current OSHA standards for the catwalk, platform, hand rail system, belt covers, shaft covers and fuel containment systems:

- The existing fuel tanks must be replaced by a double wall type tank of equivalent capacity. Contractor should arrange the fuel tank to offset the fuel filler locations to be as far as possible from the waterway.
- Install new fuel hoses routed through PVC pipe to prevent incidental damage.
- Construct a pressure treated wood frame building with galvanized metal exterior walls and roof, and lockable doors similar to the existing building. None of the materials from the existing building should be reused. Provide sufficient open space for air circulation.
- Provide catwalk from the ditch block berm or edge of road to the pump station platform. Catwalk must have metal hand rails per OSHA standards and toe boards on both sides.
- All moving parts accessible to the operator during use shall have OSHA approved covers installed.
- The existing diesel engine and frame will be relocated. Any work on the engine will be by others unless the Contractor causes damage to it handling or by his negligence in which case it shall be restored or replaced at Contractor's expense.
- Pump, discharge pipe, flap gate and intake screen shall be relocated without modifications other than the repairs described in Section 4. The pump critical elevations (platform top, pump intake, pump discharge, and center line drive shaft) shall match the existing station.

## **6. Operation and Maintenance Manual**

Contractor shall submit installation, operation and maintenance manuals (IOM Manuals) containing complete information on installation, operation, lubrication, adjustment, routine and special maintenance as would normally be supplied to the owner of a new pump station by Creel Pump or the approved equal entity.

## **7. Warranty**

Contractor shall warrant his work as specified in General Conditions. Pump repair work shall be warranted for a period no less than 1 year from date of final acceptance.

## **8. Delivery**

Contractor shall coordinate the timely delivery of the pump station equipment to the job site. Handling and storage of equipment will as recommended by the manufacturer to prevent any damage or loss. Contractor shall remain responsible for the loss mitigation, safe storage, and handling of the pump station until final acceptance by the Engineer. Any loss or damage shall be repaired or replaced by the Contractor at no cost to the Owner.

## **Material Specification 548—Corrugated Polyethylene Pipe**

### **1. Scope**

This specification covers the quality of polyethylene pipe and fittings as typically used for culverts and drainage systems.

### **2. Pipe**

Corrugated polyethylene pipe shall conform to the requirements of ASTM F 405, ASTM 667, ASTM F 894, AASHTO M 252, or AASHTO M 294 for the appropriate pipe sizes and fittings.

### **3. Fittings**

ASTM F 405	3-6 inch diameter pipe and fittings
ASTM F 667	8-24 inch diameter pipe and fittings
ASTM F 894	18 to 120 inch diameter pipe and fittings
AASHTO M 252	3-10 inch diameter pipe and fittings
AASHTO M 294	12-36 inch diameter pipe and fittings.

## **Material Specification 552—Aluminum Corrugated Pipe**

### **1. Scope**

This specification covers the quality of aluminum corrugated pipe and fittings.

### **2. Pipe**

Aluminum corrugated pipe and fittings shall conform to the requirements of ASTM B 745, B 746, or B 790 for the specified pipe sheet thickness, shape type, fabrication methods, and the following additional requirements:

- 1) When close-riveted pipe is specified:
  - A. Pipe shall be fabricated with circumferential seam rivet spacing that does not exceed 3 inches except that 12 rivets are sufficient to secure the circumferential seams in 12-inch pipe.
  - B. Longitudinal seams that will be within the coverage area of a coupling band, the rivets shall have flat heads or the rivets and holes shall be omitted and the seams shall be connected by welding to provide a minimum of obstruction to the seating of the coupling bands.

### **3. Coatings**

Bituminous coatings, when specified, shall conform to the requirements of ASTM A 849.

### **4. Coupling bands**

Coupling bands are to be provided for each section of pipe. The hardware for fastening the coupling band tightly to the connecting pipe shall be fabricated to permit tightening sufficiently to provide the required joint tensile strength and, if required, water tightness without failure of its fastening.

Gaskets, if specified, are to be provided for each coupling band. The fabrication shall also be sufficient to provide the required gasket seating without warping, twisting, or bending.

Gaskets provided with connecting bands meeting requirements for special joints in erodible soil conditions shall be as specified in ASTM A 762.

### **5. Fittings**

Fittings shall be fabricated from sheet aluminum meeting the requirements contained in ASTM B 744. The coating for fittings shall be the same as that specified for the contiguous corrugated aluminum pipe.

Fittings that are welded during fabrication shall be accomplished in a good workmanship like manner resulting in a continuous smooth surface finish. Aluminum welding electrodes used shall conform to the requirements of American Welding Society (AWS) specification AWS A5.10, "Specification for Aluminum and Aluminum Alloy Welding Rods and Bare Electrodes." Welded surfaces and adjacent surfaces damaged during welding shall be treated by removing all weld splatter. The affected surface shall be cleaned to bright metal by sand blasting, power disk sanding, or wire brushing. The cleaned area shall extend at least 0.5 inch into the undamaged section of coated area. Within 24 hours of completion of surface preparation all treated surfaces shall be painted with two coats of a chromate rich primer and allowed to fully dry before exposure to weathering conditions.

Aluminum surfaces fabricated that will have contact with steel, iron, or other metals shall be coated with a zinc-chromate primer and allowed to fully dry before final installation.

## **Material Specification 582—Galvanizing**

### **1. Scope**

This specification covers the quality of zinc coatings applied to iron and steel for corrosion resistance.

### **2. Quality**

Zinc coatings shall conform to the requirements of ASTM A 123 for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel product or as otherwise specified in the items of work and construction details on the Construction Specifications.

ASTM A 123 covers both fabricated and nonfabricated products; e.g. assembled steel products, structural steel fabrications, large tubes already bent or welded before galvanizing and wire work fabricated from noncoated steel wire. It also covers steel forgings and iron castings incorporated into the pieces fabricated before galvanizing or which are too large to be centrifuged.



## **Material Specification 2233 – Shell Rock**

### **1. Scope**

The contractor shall provide all labor, equipment and materials to construct a base course by stabilizing the access roadbed soil material with shellrock in accordance with FDOT Standard Specifications for Road and Bridge Construction Section 285 or as specified herein, and in conformity with the lines, grades, notes and typical cross sections shown in the Drawings.

### **2. Shellrock Base**

The installation of a shellrock base shall conform to the requirements of ASTM D1557-00, ASTM D 2922-01, and Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

### **3. Certifications and Testing**

If the engineer deems necessary, field density tests in accordance with ASTM D 2922-01, Test for Density of Soil and Soil-Aggregate in Place by the Nuclear Method will be performed. The areas to be tested shall be determined by the engineer. Laboratory compaction tests in accordance with D1557-00- Standard Test Methods for Laboratory compaction Characteristics of Soil Using the Modified Effort (56,000 ft-lbf/cu.ft.) will also be performed. The contractor shall make the site available for testing and cooperate fully to allow tests to be taken. Failure to meet the specified density will require the contractor to recompact and retest those areas directed by the engineer.

### **4. Inspection and Coordination**

The contractor shall provide access to the work for the engineer as requested for inspection. The Contractor shall provide 48 hours notice of its intention to begin new work activities.

### **5. Products**

#### *Shellrock*

The contractor shall provide shellrock-stabilized base materials in accordance with FDOT Standard Specifications for Road and Bridge Construction Section 913A. With the approval of the engineer suitable shellrock material shall be obtained from approved spoil areas. The minimum acceptable density of the shellrock shall be [129] lbs/cu. ft. [NTS: Confirm the minimum acceptable density for specific project.]

## Material Specification 5500—Fabricated Metalwork and Castings

### 1. Scope

The work of this section shall consist of furnishing all labor, materials, and equipment necessary for the installation of fabricated metalwork and castings as shown on the Drawings and specified herein.

### 2. Products

#### General:

- A. Unless otherwise indicated, all materials shall conform to the latest issue of the following ASTM Specifications:

<u>Item</u>	<u>ASTM Specification</u>
Steel Shapes & Plates	A 36
Steel Pipe Columns	A 501 or A 53, Type EDRS, Grade B
Stainless Steel:	
Bars & Shapes	A 276, Type 316
Steel Plate, Sheet & Strip	A 167, Type 316
Bolts	A 193, Type 316, B8MN, B8M2, or B8M3
Nuts	A 194, Type 316, B8MN, B8M2, or B8M3
Aluminum, Structural Shapes & Plates	Alloy 6061-T6; conform to referenced specifications and ASTM Sections found in the Aluminum Association current Construction Manual Series
Connection Bolts for Steel Members; Use Compressible- Washer Type Direct Tension Indicators at all Connections; Use Hardened Washers also under Head & Nut	A 325-F F 959-85  F 436 (Washers)
Anchor Bolts & Nuts:	
Carbon Steel	A 307 or A 36
Stainless	A 193, Type 316
Galvanized Steel Bolts Head & Nuts	A 153, Zinc Coating for A 307 or A 36
Flat Washers (Unhardened)	F 844, Use A 153 for Zinc Coating
Threaded Bars	A 36
Connection Bolts for Aluminum	Use appropriate Stainless Steel

- B. The miscellaneous metalwork and castings indicated on the Drawings, or required to secure the various parts together and provide a complete installation, shall be included under this section.

#### Anchor Bolts:

- A. Anchor bolts for equipment and machinery, where permanently anchored into concrete, shall be stainless steel, unless otherwise shown. The diameter, length, and any bend dimensions shall be as required by the equipment or machinery manufacturer. Unless

otherwise required, use inch minimum diameter as appropriate for mounting hole provided by device manufacturer or as recommended by device manufacturer and other geometry shown on the Drawings. Furnish a minimum of two nuts and a washer of the same material for each bolt. Provide sleeves as required or as shown for location adjustment.

- B. Submerged use is defined as any connection to concrete from a point 1 foot 6 inches above the maximum water surface in a water-holding basin and any connection below that point.
- C. Anchor bolts for other uses to anchor fabricated metalwork or structural building, or structural frame components in areas of wet use or washdown areas shall be stainless steel. Minimum size shall be as appropriate for mounting hole provided by device manufacturer or as recommended by device manufacturer and other geometry shown on the Drawings.
- D. Fasteners for safety devices such as hand rails and equipment shields shall meet all applicable OSHA standards.

#### Stainless Steel Fasteners Lubricant (Anti-seizing):

Where stainless steel nuts and machined bolts, anchor bolts, concrete anchors, and all other threaded fasteners are used, Subcontractor shall apply an anti-seizing lubricant to the threads prior to making up the connections. The lubricant shall contain substantial amounts of molybdenum disulfide, graphite, mica, talc, or copper.

#### Anchoring Systems for Concrete:

##### A. Wedge Anchors:

- 1. Wedge anchors shall be 100 percent 316 stainless steel and shall not be used below a point 1 foot 6 inches above the peak (maximum) water surface in any water-holding structure. See adhesive anchors or anchor bolts specified elsewhere in this Specification.
- 2. Wedge anchors shall be 316 stainless steel, stud type, stainless steel bolts, completely assembled, concrete anchors. Furnish sizes shown on Drawings. Provide ICBO (International Conference of Building Officials) or other similar building code organization recommendations regarding safe allowable design loads.

##### B. Expansion Anchors:

- 1. Expansion anchors shall not be used except in dry areas where future corrosion is not a problem unless the expansion anchors are 316 stainless steel. In the wet or damp areas, use wedge anchors as specified above or adhesive anchors in submerged conditions as hereinafter specified; 316 stainless steel expansion anchors may be used as defined for stainless wedge anchors.
- 2. Self-drilling anchors, snap-off type or flush type. Provide anchors for use with hot-dipped galvanized bolts. Non-drilling anchors shall be flush type for use with a bolt or stud type with projecting threaded stud. Provide ICBO or other similar code organizations' recommendations regarding safe allowable design loads.

##### C. Adhesive Anchors:

- 1. Adhesive anchors shall be used for anchoring metal components at or below a point 1 foot 6 inches above the peak (maximum) water surface elevations in water-holding structure.

2. Adhesive anchors shall be capsule anchors with 316 stainless steel stud, nuts, and washers, heavy-duty adhesive anchor rod assemblies.

#### Structural Steel Supports:

Provide all structural steel supports of the sizes and weights shown. All connections shall be welded, unless otherwise shown.

#### Bolts and Fasteners:

- A. Bolts and fasteners not permanently embedded in concrete, but located outdoors in areas subject to the weather; chemical handling areas; equipment rooms subject to drainage, leakage, and washdown; and in galleries and trenches, shall be Type 316 stainless steel as hereinbefore specified.
- B. Bolts for flanges of piping, valves, and other similar connections shall be as specified in other sections or as shown on the Drawings.

#### Grating:

- A. All grating utilized on project shall be of aluminum, unless specifically indicated otherwise.
- B. Gratings shall be provided with all frames, seat angles, fasteners, and other appropriate accessories as required. Metals to be embedded in concrete shall be Type 316 stainless steel.
- C. Fasteners for anchoring grating to beam and channel flanges shall be Universal clip type with 1/4" bolts and nuts. Fasteners shall be furnished for a minimum of four, or as required, for proper support to each panel, unless otherwise noted on the Drawings.
- D. Standard Installation clearances and tolerances shall conform to the requirements of the current Metal Bar Grating Manual published by the National Association of Architectural Metal Manufacturers.
- E. Width of any single grating section shall not exceed 4'-0".
- F. Grating shall be of the minimum thickness indicated on the Drawings for the various spans and shall be designed for the minimum uniform loads and concentrated loads as shown in the specified manufacturer's catalogs, unless otherwise indicated, with a maximum deflection not exceeding 1/4-inch and maximum allowable stress of 12,000 psi.
- G. Provide angle supports as indicated. Size support angles to provide a minimum of 1-inch support for all main-bearing bars. Band all edges and cutouts.
- H. Main bearing bars shall be of depth designated as grating thickness on the Drawings. Provide welded 3/16-inch banding for all openings and grating ends. Cross bar spacing shall be a maximum of 2-inches, unless otherwise specified. Limit lateral deflection of grating to prevent pedestrian discomfort.
  1. All cross bars shall be flush with top of grating and shall extend downward a minimum of 50 percent of the main bar depth. Swaged cross bars shall not be used.

#### Lifting Lugs:

Individual equipment and/or each filed disassembling part over 100 pounds in weight shall be provided with proper lifting lugs for easy handling.

#### Square Mesh Wire Cloth:

Wire cloth shall be Type 316 stainless steel. Size shall be 0.75-inch square mesh with 0.080-inch diameter wire, weight of 0.549 pound, per square foot, and 79.8 percent open area. Bond edges of wire cloth with rolled 316 stainless steel, 24 gauge band.

### **3. Execution**

#### General:

- A. Workmanship and finish of all metalwork specified under this section shall be the highest grade and equal to the best practice of modern shops for the respective work. Exposed surfaces shall have smooth finish and sharp, well-defined lines. Provide all necessary rabbets, lugs, and brackets so that the work can be assembled in a neat, substantial manner. Conceal fastenings where practical. Drill metalwork and countersink holes as required for attaching hardware or other materials. Fabricate metals as specified. Weld connections, except where bolting is directed. Items requiring special fabrication methods are mentioned herein. Fabrication of all other items shall be of equal quality. Methods of fabrication not otherwise specified or shown shall be adequate for the stresses and as directed by the Engineer.
- B. Grind all exposed edges of welds smooth on walkways, guardrails, handrails, stairways, channel door frames, steel column bases, and where indicated on the Drawings. All sharp edges shall be rounded to a 1/8" minimum radius; all burrs, jagged edges, and surface defects shall be ground smooth.
- C. Welds and adjacent areas shall be prepared such that there is (1) no undercutting or reverse ridges on the weld bead, (2) no weld spatter on or adjacent to the weld or any other area to be painted, and (3) no sharp peaks or ridges along the weld bead. All embedded pieces of electrode or wire shall be ground flush with the adjacent surface of the weld bead.
  1. Aluminum: Fabricate aluminum as shown, and in accordance with the Aluminum Association Standards and the manufacturer's recommendations as approved. Grind smooth sheared edges exposed in the finished work.

#### Welding:

- A. The technique of welding employed, appearance, quality of welds made, and the methods of correcting defective work shall conform to codes for Arc and Gas Welding in Building Construction of the AWS and AISC. Surfaces to be welded shall be free from loose scale, rust, grease, paint, and other foreign materials, except that mill scale that will withstand vigorous brushing may remain. A light film of linseed oil may likewise be disregarded. No welding shall be done when the temperature of the base metal is lower than 0 degrees Fahrenheit. Finished members shall be true to line and free from twists.
- B. All welding operators shall be qualified in accordance with the requirements of current AWS Standard Qualification Procedure D1.1, Chapter 5, and welders of structural and reinforcing steel shall be certified for all positions of welding in accordance with such procedure. A recognized testing laboratory shall run qualification tests at the Subcontractor's expense.

- C. All welding operators shall be subject to examination for requalification using the equipment, materials, and electrodes employed in the execution of the Contract work. Such requalification, if ordered by the Engineer, shall be done at the expense of the Subcontractor.
  - 1. Aluminum: Aluminum shall be welded with Gas Metal Arc (MIG) or Gas Tungsten Arc (TIG) processes in accordance with the manufacturer's recommendations as approved, and in accordance with the recommendations of the American Welding Society contained in the Welding Handbook, as last revised. Grind smooth all exposed aluminum welds.

Installation of Fabricated Metalwork:

Install in accordance with the shop drawings, the Drawings, and these specifications. Perform field welding and erection work by skilled mechanics. Install fabricated metalwork plumb or level as applicable. The complete installations shall, in all cases, be rigid, substantial, and neat in appearance. Erect structural steel in accordance with the applicable portions of AISC Code of Standard Practice, except as modified. Install commercially manufactured products in accordance with manufacturer's recommendations as approved.

- A. Aluminum: Erection of aluminum shall be in accordance with the Aluminum Association. Mill marking shall not be removed from concealed surfaces. Exposed surfaces not otherwise coated shall have the inked or painted identification marks removed after the material has been inspected and approved by the Engineer.

Anchor Bolts:

All anchor bolts shall be accurately located and held in place with templates at the time the concrete is poured.

Concrete Anchors:

Installation shall not begin until the concrete or masonry receiving the anchors has attained its design strength. An anchor shall not be installed closer than six times its diameter to either an edge of the concrete or masonry, or to another anchor, unless specifically detailed otherwise on the Drawings. Install in strict accordance with manufacturer's written instructions. Use manufacturer's recommended drills and equipment.

Galvanizing and Repair:

- A. Galvanizing of steel plates, shapes, bars (and products fabricated from these items), and strip 1/8-inch thick or thicker, shall conform to ASTM A 120. Material thinner than 1/8-inch shall either be galvanized before fabrication in conformance with the requirements of ASTM A 525, Coating Designation G 210 or after fabrication, in conformance with the requirements of ASTM A 123, except that the weight of zinc coating shall average not less than 1.2 ounces per square foot of actual surface area with no individual specimen having a weight of less than 1.0 ounce. Unless otherwise provided, galvanizing shall be done before or after fabrication, for material that is thinner than 1/8-inch, at the option of the Subcontractor. Galvanizing will not be required for stainless steel, monel metal, and similar corrosion-resistant parts.
- B. All welded areas shall be thoroughly cleaned prior to galvanizing to remove all slag or other material that would interfere with the adherence of the zinc. When it is necessary to

straighten any sections after galvanizing, such work shall be performed without damage to the zinc coating.

- C. In like manner, galvanizing of iron and steel hardware, and nuts and bolts, shall conform to ASTM A 153. Galvanizing shall be performed after fabrication. Galvanizing of tapped holes will not be required.
- D. Fabrication shall include all operations such as shearing, cutting, punching, forming, drilling, milling, bending, welding, and riveting.
- E. Components of bolted assemblies shall be galvanized separately before assembly.
- F. The minimum pitch diameter of the threaded portion of all bolts, anchor bars, or studs shall conform to ANSI B1.1, having a Class 2A tolerance before galvanizing. After galvanizing, the pitch diameter of the nuts or other threaded parts may be tapped over ANSI B1.1, Class 2B tolerance, by the following maximum amounts:

3/8-inch through 9/16-inch	0.016-inch oversize
5/8-inch through 1-inch	0.023-inch oversize
1-1/8 inches and larger	0.033-inch oversize
- G. Except for inlet grates not otherwise required to be welded, all edges of tightly contacting surfaces, where galvanizing is required, shall be completely sealed by welding before galvanizing.
- H. Galvanized surfaces that are abraded or damaged at any time after the application of the zinc coating shall be repaired in accordance with SECTION 09900.

Electrolytic Protection:

Where aluminum is in contact with dissimilar metals, or to be embedded in masonry and concrete, protect surfaces. Allow paint to dry before installation of the materials. Protect painted surfaces during installation; should coating become marred, prepare and touch up surface per paint manufacturer's instructions.

Painting:

Thoroughly clean all ferrous metal items not galvanized and give a shop coating of metal primer. Preparation of surfaces and application of primer shall be in accordance with the paint manufacturer's printed directions and recommendations as approved; and in accordance with SECTION 09900, utilizing the appropriate painting system.

Preparation for Shipment:

Insofar as is practical, the items provided hereunder shall be factory assembled. The parts and assemblies that are of necessity shipped unassembled, shall be packaged and clearly tagged in a manner that will protect the materials

## **Material Specification 09870— Pressure Treated Lumber and Structural Members**

### **1. Scope**

The work of this section consists of furnishing pressure treated lumber and structural timber as called for in the Drawings or as specified herein, including boards for flashboard water control risers.

### **2. Applicable publications**

The following standard specifications shall apply to the Work of this Section as indicated:

- a. Southern Pine Inspection Bureau, Standard Grading Rules, latest edition, (SPIB).
- b. American Society for Testing Materials (ASTM).
- c. United States Environmental Protection Agency.
- d. American Wood Preserves Association (AWPA).

### **3. General requirements**

Lumber and structure timber shall be in accordance with ASTM D 1760-01 and be manufactured and graded in accordance with the current edition of the Standard Grading Rules for Southern Pine Timber, of the SPIB.

### **4. Component requirements**

**Preservative**— The following pressure treated wood formulations are acceptable:

- a. DOT Sodium Borate (SBX) [except where moisture exposure is likely]
- b. Alkaline Copper Quaternary (ACQ-C and ACQ-D with carbonate)
- c. Copper Azole (CBA-A and CA-B)

**Treatment method**— The method of treatment for all timber materials shall be in accordance with ASTM D 1760-01. Use of Chromated Copper Arsenate (CCA) treated timber is not permitted.

Additionally, use of Copper Zinc Arsenate (ACZA) treated timber is not permitted due to its extremely high corrosiveness when in contact with metal products.

**Pressure treatment**— Pressure treatment shall be in accordance with the requirements of American Wood Preserves Association (AWPA) Standard C1, as well as AWPA Standard C2 for lumber and AWPA Standard C9 for plywood. Each piece of pressure preservative treated shall bear the AWPA stamp, indicating point of treatment, preservative symbol, symbol of standard, dated of treatment, and moisture content after treatment.

### **5. Installation**

Avoid milling operations that could adversely affect preservative characteristics of preservative treated wood. Treat end cuts of preservative treated wood members with field-applied end coat prior to installation. Install using stainless steel, hot-dipped galvanized or other approved fasteners for use with treated lumber and plywood.

#### Work Items: Flash Board Risers

1. Contractor shall supply and cut to fit 2" x 6" pressure treated lumber for each flash board riser sufficient to fill the board slots completely to the top of the riser.



## **Material Specification 09900— Protective Coatings**

### **1. Scope**

**Summary of work.** The Subcontractor shall provide coating on exterior and interior surfaces as specified throughout the Project.

**Regulatory requirements.** In addition to requirements specified elsewhere for environmental protection, provide coating materials that conform to the restrictions of the local and regional jurisdiction. Notify the engineer of any coating specified herein that fails to conform to the requirements for the location of the project or location of application.

- Lead Content: Use only coatings that are totally lead free.
- Chromate Content: Do not use coatings containing zinc-chromate or strontium chromate.
- Asbestos Content: Materials shall not contain asbestos.
- Mercury Content: Materials shall not contain mercury or mercury compounds.
- The specified maximum VOC content shall apply to the unthinned product.

### **2. Applicable publications**

#### **American National Standards Institute (ANSI):**

A 13.1 - Scheme for the Identification of Piping Systems.

Z 53.1 - Safety Color Code for Marking Physical Hazards.

#### **American Society for Testing and Materials (ASTM):**

D4258 - Standard Practice for Surface Cleaning Concrete for Coating.

D4259 - Standard Practice for Abrading Concrete.

D4260 - Standard Practice for Acid Etching Concrete.

D4261 - Standard Practice for Surface Cleaning Concrete Unit Masonry for Coating.

#### **Society for Protective Coatings (SSPC) Surface Preparation Specifications:**

SP1 - Solvent Cleaning: Removes oil, grease, soil, drawing and cutting compounds, and other soluble contaminants.

SP2 - Hand Tool Cleaning: Removes loose mill scale, loose rust, loose paint and other loose foreign matter.

SP3 - Power Tool Cleaning: Removes loose material. Not intended to remove all scale or rust.

SP5 - White Metal Blast Cleaning: Removes all scale, rust, foreign matter. Leaves surface gray-white uniform metallic color.

SP6 - Commercial Blast Cleaning: Two-thirds of each square inch free of all visible residues; remainder only light discoloration.

SP7 - Brush-Off Blast Cleaning: Removes only loose material, remaining surface tight and abraded to give anchor pattern.

SP10 - Near-White Blast Cleaning: At least 95% of each square inch shall be free of all visible residues.

SP11 - Power Tool Cleaning to Bare Metal.

### 3. Definitions

Coating systems include surface preparation, prime coat (first coat), finish coats (second and third coats), inspection, cleaning, and touch-up of surfaces and equipment. Shop preparation, prime coat, and finish coats to be shop-applied may be specified elsewhere or referenced to this Section so that a complete system is specified and coordinated.

- 1) Where surface preparation and first (prime) coat are specified in other Sections to be shop-applied, such as for structural steel, hollow metal doors or equipment, only the touch-up and finish coats are a part of field painting. Surface preparation is the required degree of preparation prior to application of first (prime) coat regardless if done in shop or field.
- 2) If materials are provided without shop primer such as miscellaneous steel or sheet metal, then surface preparation, first, second, and third coats are a part of field painting.
- 3) Concealed surfaces are generally not required to have finish-coats unless otherwise specified, but prime coat should be applied and touched up prior to concealment.
- 4) Where equipment and materials are provided with shop-applied finished coating system, only touch up is a part of field painting.
- 5) Refer to applicable Sections to determine whether surface preparation and first coat, or complete coating system, is to be shop-applied.
- 6) The term "DFT" means minimum dry film thickness, with no tolerance for thinner films.

### 4. Submittals

Submittals include, but are not limited to, the following:

- 1) Schedule of products and paint systems to be used. Schedule shall include the following information:
  - A. Surfaces for system to be applied.
  - B. Surface preparation method and degree of cleanliness.
  - C. Product manufacturer, name, and number.
  - D. Method of application.
  - E. Dry film thickness per coat of coating to be applied.
- 2) Color charts for selection and acceptance.
- 3) Product information
  - A. Manufacturer's data sheet for each product proposed
  - B. Technical and performance information that demonstrates compliance with the system performance and material requirements
  - C. Manufacturer's instructions and recommendations on surface preparation and application
  - D. Compatibility of shop and field applied coatings (where applicable)
  - E. Material Safety Data Sheet for each product used

- 4) Certification by coating manufacturers that each coating is suitable for service intended as stated on each coating system sheet.
- 5) Subcontractor shall certify in writing to the Engineer that applicators have previously applied all the systems in this Specification and have the ability and equipment to prepare the surfaces and apply the coatings correctly.
- 6) Samples
  - A. Sample of each paint, finish, and other coating material on 8-1/2 inch by 11-inch sheet metal. Each sheet shall be completely coated over its entire surface with one coating material, type, or color.
  - B. Two sets of color samples that match each color selected by the Engineer from the manufacturer's color charts. The color designation shall be shown on the back of the color sample.

## 5. Qualifications

Coating work shall be performed by an SSPC certified contractor having a minimum of Category QP 1 certification for work without hazardous paint removal, and Category QP 2 certification for work involving hazardous paint removal.

## 6. Inspection coordination

- 1) Prepainting Conference: Before field painting starts, representatives for the Subcontractor & Contractor with Engineer's personnel.
- 2) Agenda for the meeting will include details of surface preparations and coating systems to ensure understanding and agreement by all parties for compliance.
- 3) A coating report shall be completed daily by Subcontractor at each phase of the coating system starting with surface preparation. Reports shall be submitted on the form attached at end of this Section.
- 4) In the event a problem occurs with coating system, surface preparation, or application, coating applicator and coating manufacturer's technical representative shall promptly investigate the problem and submit results to Engineer.
- 5) Whenever water tightness in a water-retaining structure is dependent upon work in other sections, the Subcontractor shall assume full responsibility for water tightness of the integrated assembly. Prior to starting work, Subcontractor shall meet with installers involved and with manufacturers of all materials involved to review Drawings and Specifications to insure that materials are being used properly and details are correct. A written report of this meeting shall be submitted to the Engineer. The report shall contain at least: Meeting date and names and affiliations of those present and written statements from each installer and manufacturer of their acceptance of Drawings, Specifications and conditions, and of proposed use of their materials as proper for purposes shown.

## 7. Warranty

**Warranty inspection.** A warranty inspection may be conducted during the eleventh month following completion of coating and painting work. Subcontractor and a representative of the coating material manufacturer shall attend this inspection. All defective work shall be repaired in accordance with these specifications and to the satisfaction of the Contractor. The Subcontractor

may, by written notice to the Contractor, reschedule the warranty inspection to another date within the one year correction period or may cancel the warranty inspection altogether. If the warranty inspection is not held, the Subcontractor is not relieved of its other responsibilities under the Contract Documents.

Furnish a warranty issued jointly with the manufacturer and the applicator of the exterior and interior coating, against moisture penetration through treated surfaces for a period of five years. The warranty shall cover both the material necessary to remedy a problem and the labor and equipment to apply the material. At satisfactory completion of the work, the warranty shall be completed, signed, notarized, and delivered to the Engineer.

**8. General product information**

Materials furnished for each coating system must be compatible with the substrate.

**Single manufacturer.** All materials in each coating system shall be by the same coating manufacturer to assure compatibility of coatings.

**Compatibility.** When shop-painted surfaces are to be field coated, the Subcontractor shall ascertain whether finish materials will be compatible with shop coating. Coatings of uncertain composition shall be removed completely before applying new coatings

**Colors.**

- 1) Color of finish coatings shall match accepted color samples.
- 2) When second and finish coats of a system are of same type, Subcontractor shall tint or use an alternate color on second coat to enable visual coverage inspection of the third coat. When first and second coats only are specified and are of same or different types, tint or use an alternate color on first coat to enable visual coverage inspection of the second coat.

**Include on label of material containers**

- 1) Manufacturer's name, product name, and number.
- 2) Type of paint and generic name.
- 3) Color name and number.
- 4) Storage and temperature limits.
- 5) Mixing and application instructions, including requirements for precautions which must be taken.
- 6) Drying, recoat, or curing time.

**Surfaces to be coated**

Generic Description	Example of Surfaces	System
Steel equipment and structural steel, prime coated, normal exposure, non-immersion, interior and exterior	1. Carbon steel in fabricated equipment for machinery	S-3
Aluminum in contact with concrete or any other metal	1. Railing posts, CMP culverts	A-1

### **Surfaces not to be coated**

- 1) Drainage pumps shall be coated by pump manufacturer and only touch up paint supplied by them will be used in the field. See construction specification CS11200.
- 2) Factory finished equipment, except for touch-up or noted otherwise.
- 3) Metal surfaces of stainless steel, bronze, aluminum, and fiberglass.
- 4) Concrete, unless listed on specific surfaces above.
- 5) Machined surfaces
- 6) Grease fittings
- 7) Glass
- 8) Equipment nameplates
- 9) Platform gratings, stair treads, door thresholds, and other walking surfaces unless listed on specific surfaces above
- 10) Concrete Floors unless listed above.

### **9. Delivery, storage, and handling**

**Manufacturer recommendations.** Unless this specification requires otherwise, Subcontractor shall strictly follow the manufacturer's printed recommendations and instructions for storing and handling coating system materials.

**Delivery of materials.** Deliver in sealed containers with labels and information legible and intact. Containers shall also have correct labels with required information. Subcontractor shall allow sufficient time for testing if required.

**Storage of materials.** Subcontractor shall store under conditions recommended by the Material Safety Data Sheets

- 1) All protective coating materials shall be used within the manufacturer's recommended shelf life.
- 2) Store only acceptable materials on Project site.
- 3) Provide separate area and suitable containers for storage of coatings and related coating equipment.
- 4) Dispose of used or leftover containers, thinners, rags, brushes, and rollers in accordance with applicable regulations.

### **10. Preparation for coating**

**General.** All surfaces to receive protective coatings shall be clean prior to application of coatings. The Subcontractor shall examine all surfaces to be coated, and shall correct all surface defects before application of any coating material. All marred or abraded spots on shop-primed and on factory-finished surfaces shall receive touch-up restoration prior to any coating application. Surfaces to be coated shall be dry and free of visible dust.

**Protection of surfaces not to be coated.** Surfaces that are not to receive protective coatings shall be protected during surface preparation, cleaning, and coating operations.

Hardware, lighting fixtures, switch plates, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not to be painted shall be removed, masked, or otherwise protected. Drop cloths shall be provided to prevent coating materials from falling on or marring adjacent surfaces. The working parts of mechanical and electrical equipment shall be protected from damage during surface preparation and coating operations. Openings in motors shall be masked to prevent entry of coating or other materials.

Care shall be exercised not to damage adjacent work during blast cleaning operations. Spray painting shall be conducted under carefully controlled conditions. The Subcontractor shall be fully responsible for and shall promptly repair any and all damage to adjacent work or adjoining property occurring from blast cleaning or coating operations.

**Protection of painted surfaces.** Cleaning and coating shall be coordinated so that dust and other contaminants from the cleaning process will not fall on wet, newly coated surfaces.

## **11. Surface preparation**

### **General**

- 1) Prepare surfaces for each coating system conforming to SSPC or ASTM surface preparation specifications listed. If grease or oils are present, SSPC-SP1 must precede any other method specified. Remove surface irregularities such as weld spatter, burrs, or sharp edges, prior to specified surface preparation.
- 2) Depth of profile shall be as specified for each system, but in no instance shall it exceed one-third of the total dry-film thickness of complete system.
- 3) Prepare only those areas which will receive the first coat of the system on the same day.

### **Metals**

- 1) The minimum abrasive blasting surface preparation shall be as indicated in the coating system sheets included at the end of this Section. Where there is a conflict between these specifications and the coating manufacturer's printed recommendations for the intended service, the higher degree of cleaning shall apply.
- 2) All sharp edges shall be rounded or chamfered, and all burrs, surface defects, and weld splatter shall be ground smooth prior to blast cleaning.
- 3) The type and size of abrasive shall be selected to produce a surface profile that meets the system sheet requirements for the particular coating and service conditions. Abrasives for submerged and severe service coating systems shall be clean, hard, sharp cutting crushed slag. Automated blasting systems shall not be used for surfaces that will be in submerged service. Metal shot or grit shall not be used for surfaces that will be in submerged service, even if subsequent abrasive blasting is planned to be one with hard, sharp cutting crushed slag.
- 4) Abrasive shall not be reused unless an automated blasting system is used for surfaces that will be in non-submerged service. For automated blasting systems, clean oil-free abrasives shall be maintained. The abrasive mix shall include at least 50 percent grit.
- 5) The Subcontractor shall comply with the applicable federal, state, and local air pollution control regulations for blast cleaning.
- 6) Compressed air for air blast cleaning shall be supplied at adequate pressure from well

maintained compressors equipped with oil and moisture separators that remove at least 95 percent of the contaminants.

- 7) Surfaces shall be cleaned of all dust and residual particles of the cleaning operation by dry air blast cleaning, vacuuming, or another method prior to painting.
- 8) Enclosed areas and other areas where dust settling is a problem shall be vacuum cleaned and wiped with a tack cloth.
- 9) Damaged or defective coating shall be removed by the blast cleaning to meet the clean surface requirements before recoating.
- 10) If the required abrasive blast cleaning will damage adjacent work, the area to be cleaned is less than 100 square feet, and the coated surface will not be submerged in service, then SSPC SP2 or SSPC SP3 may be used.
- 11) Shop applied coatings of unknown composition shall be completely removed before the indicated coatings are applied. Valves, castings, ductile iron pipe, and fabricated pipe or equipment shall be examined for the presence of shop-applied temporary coatings. Temporary coatings shall be completely removed by solvent cleaning per SSPC SP1 before the abrasive blast cleaning work is started.
- 12) Shop primed equipment shall be solvent cleaned in the field before finish coats are applied.

#### **Concrete and concrete masonry units**

- 1) Surface preparation shall not begin until at least 30 days after the concrete or masonry has been placed.
- 2) All oil, grease, and form release and curing compounds shall be removed by detergent cleaning per SSPC SP1 before abrasive blast cleaning.
- 3) Concrete, concrete block masonry surfaces and deteriorated concrete surfaces to be coated shall be abrasive blast cleaned to remove existing coatings, laitance, deteriorated concrete, and to roughen the surface equivalent to the surface of the No. 80 grit flint sandpaper.
- 4) If acid etching is required by the coating application instructions, the treatment shall be made after abrasive blasting. After etching, Subcontractor shall rinse surfaces with water and test the pH. The pH shall be between neutral and 8.
- 5) Surfaces shall be clean and as recommended by the coating manufacturer before coating is started.
- 6) Unless required for proper adhesion, surfaces shall be dry prior to coating. The presence of moisture shall be determined with a moisture detection device such as Delmhorst Model DB, or equal.

#### **12. Application**

- 1) Subcontractor shall apply coatings in accordance with coating manufacturer's recommendations. Materials shall be thoroughly stirred, strained, and kept at uniform consistency during application. Coatings from different manufacturers shall not be mixed together.
- 2) Use properly designed brushes, rollers, and spray equipment for all applications.
- 3) On unprimed surfaces apply first coat of the system the same day as surface preparation.

- 4) Cleaned surfaces and all coats shall be inspected prior to each succeeding coat. The Subcontractor shall schedule such inspection with the Engineer in advance.
- 5) Blast cleaned ferrous metal surfaces shall be painted before any rusting or other deterioration of the surface occurs. Blast cleaning shall be limited to only those surfaces that can be coated in the same working day.
- 6) Special attention shall be given to edges, angles, weld seams, flanges, nuts and bolts, and other places where insufficient film thicknesses are likely to be present. Use stripe painting for these areas.
- 7) Dry-film thickness of each system shall be at least as thick as the minimum specified. Maximum dry-film thickness shall not exceed the minimum more than 20% or coating manufacturer's requirements, whichever is less. Where a dry-film thickness range is specified, the thickness shall not be outside the range.
- 8) Shop and field painting shall not be applied within 3 inches of unprepared surface of any substrate such as areas to be welded or bolted.

#### **Environmental conditions**

- 1) Atmospheric temperature must be 50 degrees Fahrenheit or higher during application, unless approved in writing by coating manufacturer. Do not apply coatings when inclement weather or freezing temperature may occur during the curing time interval.
- 2) Wind velocities for exterior applications shall be at a minimum to prevent overspray or fallout and not greater than coating manufacturer's limits.
- 3) Relative humidity must be less than 85% and the temperature of the surface to be painted must be at least 5 degrees above the dew point.
- 4) Provide adequate ventilation in all areas of application to ensure that at no time does the content of air exceed the Threshold Limit Value given on the manufacturer's Material Safety Data Sheets for the specific coatings being applied.

**Recoat time.** In the event a coating, such as an epoxy, has exceeded its recoat time limit, prepare the previously applied coating in accordance with manufacturer's recommendations.

#### **Protection:**

- 1) Cover or otherwise protect surfaces not to be painted. Remove protective materials when appropriate.
- 2) Mask, remove, or otherwise protect finish hardware, machined surfaces, grilles, lighting fixtures, and prefinished units as necessary.
- 3) Provide cover or shields to prevent surface preparation media and coatings from entering orifices in electrical or mechanical equipment. Where ventilation systems must be kept in operation at time of surface preparation, take precautions to shield intakes and exhausts to prevent the materials from entering system or being dispersed.
- 4) Provide signs to indicate fresh paint areas.
- 5) Provide daily cleanup of both storage and working areas and removal of all paint refuse, trash, rags, and thinners. Dispose of leftover containers, thinners, rags, brushes, and rollers that cannot be reused in accordance with applicable regulations.



- 6) Do not remove or paint over equipment data plates, code stamps on piping, or UL fire-rating labels.

### **13. Inspection**

- 1) Subcontractor shall provide and use a wet-film gauges to check each application approximately every 15 minutes in order to immediately correct film thickness under or over that specified.
- 2) On ferrous surfaces, measurements shall be made with one of the thickness gauges listed below. The gauge shall be calibrated on metal practically identical in composition and surface preparation to that being coated and be of substantially the same thickness, except that for measurements on metal thicker than 1/4 inch, the instrument may be calibrated on metal with a minimum thickness of 1/4 inch. When calibrating any of the gauges for making film measurements of over 3 mils, the calibrating thickness standards (shims) shall be of non-metallic composition. Where only one thickness criterion is specified, the calibrating shim thickness shall closely approximate the specified thickness, but where both thicknesses are specified, the shim's thickness shall closely approximate an average of the two. Calibrating instructions, thickness standards and, in the case of the Mikrotest gauge, a calibrating tool, should obtained from the manufacturer or supplier of the gauge.
- 3) Use holiday or pinhole detector on systems over metal substrates to detect and correct voids when indicated on system sheet.
- 4) Furnish a sling psychrometer and perform periodic checks on both relative humidity and temperature limits.
- 5) Check temperature of the substrate at regular intervals to be certain surface is 5 degrees Fahrenheit or more above the dew point.

### **14. Cleaning and repairs**

Remove spilled, dripped, or splattered paint from surfaces.

Touch up and restore damaged finishes to original condition. This includes surface preparation and application of coatings specified

## Electrical Specification 13300 – Pump Instrumentation and Controls – General Provisions

### 1. Scope

A single preapproved system supplier (Supplier) shall furnish all services and equipment defined herein and in other Specification sections as listed below under related work which shall include the following:

- 1) Furnish a dead front NEMA 4X controls panel(s) as needed to house a PLC based control and two soft start motor controls for \*75 HP, 208-230/460 Volt, 3 phase, 60 Hz, TEFC, T Frame Motors. (\*Contractor shall verify motor specifications with pump manufacturer before purchasing control system)
- 2) A communication link between the pump station site and some remote control/monitoring station, location to be determined later, may be required in the future but is not part of this project.
- 3) Provide two 4-20 ma liquid level monitoring with level sensors for water supply canal and stormwater pond. Level sensors shall include mounting hardware. Water level shall be calibrated to actual NAVD 88 elevation.
- 4) Provide two liquid minimum water level safety switches to be installed in each of the precast concrete pump sumps to protect pumps from damage due to clogged intake screens. Level switches shall include adjustable mounting hardware.
- 5) Provide a Programmable Logic Controller to integrate the functions of the soft start motor controllers, level sensors, motor and pump safeties and manual switches and indicator lights. The PLC shall have installed a custom program for lift station pumps with pump alternation, adjustable time delays and water level settings.
- 6) Provide TVSS for each sensor wire, for the 3 phase primary power, each soft starter, 120 VAC control wire and the PLC.
- 7) Provide one 120 VAC, 15 amp service outlet and one 120 VAC, 5 amp outlet for photocell controlled area lighting fixture.

The supplier shall provide all materials, equipment, labor and services required to achieve a fully integrated and operational system. The supplier shall design and coordinate the instrument and control system for proper operation with related equipment and materials furnished by other suppliers under other sections of these Specifications and with related existing equipment.

Auxiliary and accessory devices necessary for system operation or performance, such as transducers or relays to interface with existing equipment or equipment provided by other suppliers under other Sections of these Specifications, shall be included whether they are shown on the instrument drawings or not.

Substitutions on functions or type of equipment specified will acceptable with submittal of shop drawings and approval by Engineer. In order to insure the interchangeability of parts, the maintenance of quality, the ease of interfacing between the various subsystems and the establishment of minimums with regard to ranges and accuracy, strict compliance with the above requirements shall be maintained. In order to insure compatibility between all equipment, it shall be the responsibility of the system supplier to coordinate all interface requirements with mechanical and electrical system suppliers and furnish any signal isolation devices that might be required.

Equipment shall be fabricated, assembled, installed and placed in proper operating condition in full conformity with detail Drawings, specifications, engineering data, instructions and recommendations of the equipment manufacturer as approved by the Engineer.

To facilitate the Owner's future operation and maintenance, products shall be of the same major instrumentation manufacturer, with panel mounted devices of the same type and model as far as possible.

Equipment removed in the course of this work shall remain the property of the Owner.

All equipment and installations shall satisfy applicable Federal, State and local codes.

Supplementing this Section, the Drawings and the related Specification sections provide additional details showing panel elevations, instrument device schedules, functional requirements of the system and interaction with other equipment.

The system supplier shall furnish start-up assistance and system check-out services.

## **2. Related Work**

The instrument supplier shall provide all equipment and services defined in this specification.

Instrument and control systems supplied by the supplier shall be designed and coordinated for proper operation with related equipment and materials furnished by other suppliers under other sections of these specifications and to related existing equipment.

Review of submittals prior to final determination of related equipment shall not relieve the contractor from supplying the systems in full compliance with the specific requirements of the related equipment.

## **3. Qualifications**

The system shall be supplied by Curry Controls Company, Lakeland Florida or equal. The control company shall have been in regular business for at least 5 years designing, fabricating, wiring and servicing custom automation and motor control systems and must have an UL approved shop. The company shall be located in Florida or have a facility within 120 miles of the job site which offers customer support, parts and service.

## **4. General Submittal Requirements**

Submit shop drawings in accordance with GS 025. These shop Drawings shall fully demonstrate that the equipment and services to be furnished will comply with the provisions of these specifications and shall provide a true and complete record of the equipment as manufactured and delivered. Submittals shall be bound in separate three-ring binders, with an index and sectional dividers, with all Drawings reduced to a maximum size of 11-in by 17-in for inclusion within the binder. Separate submittals shall be made as follows:

- 1) Project Plan
- 2) Process instrumentation and controls
- 3) Digital system hardware (programmable controllers, computers, peripherals, etc.)
- 4) Digital system software
- 5) Digital specific system software applications

The project plan shall be submitted and approved before any further submittals will be accepted.

Testing Related Submittals:

- 1) Test Procedures: Submit the procedures proposed to be followed during the in shop and in field tests. Procedures shall include test descriptions, forms, and checklists to be used to control and document the required tests.
  - A. Preliminary test procedure submittals: Prior to the preparation of the detailed test procedures, submit outlines of the specific proposed tests. Submittals shall include examples of the proposed forms and checklists.
  - B. Test Procedure Submittals: After the preliminary test procedure submittals have been reviewed by the Engineer and returned stamped either "approved" or "approved as noted, confirm" submit the proposed detailed test procedures. Following this, the tests may be started.
- 2) Test Documentation: Upon completion of each required tests, document the test by submitting a copy of the signed off test procedures.

Spares, Expendables, and Test Equipment Lists Submittal - This submittal shall include for each Subsystem:

- 1) A list of, and descriptive literature for, spares, expendables and test equipment as specified below.
- 2) A separate list of, and descriptive literature for, additional spares, expendables and test equipment recommended by the System Supplier.
- 3) Provide special storage and handling instructions for spare parts if appropriate.

Process Instrumentation and Controls - This submittal shall provide complete documentation of all field instruments, control panels and other instrument and control equipment not specified to be submitted elsewhere.

- 1) Provide data sheets for each component listing all model numbers, optional and ancillary devices that are being provided.

The data sheets shall be provided with an index and proper identification and cross referencing. They shall include but not be limited to the following information.

- A. Identification tag number per the Loop Diagrams.
- B. Product (item) name used herein and on the Contract Drawings.
- C. Manufacturer's complete model number.
- D. Location of the device.
- E. Input - output characteristics.
- F. Range, size and graduations.
- G. Physical size with dimensions, enclosure NEMA classification and mounting details.
- H. Materials of construction of all components.
- I. Instrument or control device sizing calculations where applicable.
- J. Certified calibration data on all flow metering devices.

- 2) Provide equipment specification sheets which shall fully describe the device, the intended function, how it operates and its physical environmental and performance characteristics. Each data sheet shall have appropriate cross references to loop or equipment identification tags. As a minimum the specification sheets shall include the following:
  - A. Dimension, rigid-clearances or scaled drawing.
  - B. Mounting or installation details.
  - C. Connection.
  - D. Electrical power.
  - E. Materials of construction.
  - F. Environmental characteristics.
  - G. Performance characteristics.
- 3) Provide detailed loop diagrams on a single 11-in by 17-in or 8.5-in by 11-in sheet for each monitoring or control loop. The loop diagram shall show all components of the loop both analog, digital and discrete including all relays, switches, dropping resistors, etc which are being provided for proper operation. Loop numbers used shall correspond to the loop numbers indicated in the contract documents. The format shall be the Instrument Society of America, Standard for Instrument Loop Diagrams, ISA-S5.4 plus the following requirements:
  - A. On each diagram present a tabular summary of 1) the output capability of the transmitting instrument, 2) the input impedance of each receiving instrument, 3) an estimate of the loop wiring impedance based on wire sizes and approximate length used, 4) the total loop impedance, 5) reserve output capacity.
  - B. Show all interconnecting wiring between equipment, panels, terminal junction boxes and field mounted components. The diagrams shall show all components and panel terminal board identification numbers and all wire numbers. This diagram shall include all intermediate terminations between field elements and panels (e.g. terminal junction boxes). The diagrams shall be coordinated with the electrical supplier and shall bear his/her mark showing this has been done.
  - C. Show location of all devices.
  - D. Show instrument description showing type, manufacturer, model number, range, set points and operation (e.g. fail open, open on energization, normally closed, etc) as applicable.
  - E. Show all instrument loop power or instrument air requirements back to termination on terminal block or bulkhead, fuse block (including fuse size), etc, as applicable.
  - F. Show all grounding points within cabinets and panels and identify the connection point of individual components.
- 4) Provide detailed Drawings covering control panels consoles and/or enclosures which shall include:
  - A. Cabinet assembly and layout Drawings to scale. These shall include both front and interior layouts.

- B. Material, fabrication and painting specifications.
  - C. Provide ladder type schematic diagrams for all hardwired discrete control and power circuits. Diagrams shall show all devices requiring electrical connection. Panel schematic diagrams shall identify all wire types. Relay contacts shall be referenced by line number and sheet number. Schematics shall show each circuit individually, no common schematics will be allowed.
  - D. Panel wiring diagrams showing all power connections to equipment within and on the panel, combined panel power draw requirements (volts, amps), breaker sizes, fuse sizes and grounding. This wiring diagram shall be in ladder logic format and shall reference the appropriate loop drawing for continuations or details where required. Show all wire numbers, and terminal block designations.
- 5) The submittal shall also contain all planning information, site preparation instructions, grounding and bonding procedures, cabling diagrams, plug identifications, safety precautions or guards and equipment layouts in order to enable the Contractor to proceed with the detailed site preparation for all equipment.

Digital System Hardware (Programmable Controllers, Computers, Peripherals, etc.) - This submittal shall provide complete documentation of the proposed hardware including:

- 1) A complete system block diagram(s) showing in schematic form, the interconnections between major hardware components such as; control centers, panels, power supplies, consoles, computer and peripheral devices, telemetry equipment, local digital processors and like equipment. The block diagram shall reflect the total integration of all digital devices in the system and shall reflect any man/machine interface locations. All components shall be clearly identified with appropriate cross references to the location of each.

The diagram shall reference all interconnecting cabling requirements for digital components of the system including any data communication links.

- 2) Data sheet for each hardware component listing all model numbers, optional, auxiliary and ancillary devices that are being provided.

The data sheets shall be provided with an index and proper identification and cross referencing. They shall include but not be limited to the following information.

- A. ID tag per the Loop Diagrams (as applicable).
- B. Product (item) name used herein and on the Contract Drawings.
- C. Manufacturer's complete model number.
- D. Location of the device.
- E. Input - output characteristics.
- F. Range, size, and graduations.
- G. Physical size with dimensions, enclosure NEMA classification and mounting details.
- H. Materials of construction of all components.
- I. Power supply device sizing calculations where applicable.

- 3) Equipment specification sheets which shall fully describe the device, the intended function, how it operates and its physical environmental and performance characteristics. Each data sheet shall have appropriate cross references to loop or equipment identification tags. As a minimum the specification sheets shall include the following:
  - A. Dimensions and working clearances.
  - B. Mounting or installation details.
  - C. Connection diagrams.
  - D. Electrical power requirements (volts, amps).
  - E. Materials of construction.
  - F. Environmental characteristics.
  - G. Performance characteristics.
- 4) Detailed drawings covering control consoles and/or enclosures which shall include:
  - A. Cabinet assembly and layout Drawings to scale. These shall include both front and rear layouts.
  - B. Fabrication and painting specifications.
  - C. Color selection samples for selection by the Engineer.
  - D. Panel wiring diagrams showing all power connections to equipment within and on the enclosure, combined panel power draw requirements (volts, amps), breaker sizes, fuse sizes and grounding.
- 5) The System Hardware submittal shall also contain all planning information, site preparation instructions, grounding and bonding procedures, cabling diagrams, plug identifications, safety precautions or guards and equipment layouts in order to enable the Contractor to proceed with the detailed site preparation for all equipment.
- 6) Network Analysis: A complete network analysis covering the ultimate system configuration shall be provided within 90 days of Award of Contract.

Digital System Software:

- 1) The Software Functional Design submittal shall provide a complete description of the system on a functional level. The software shall be organized into functional subsystems. The intent of the Software Functional Design submittal shall be to describe, in detail, what functions are to be performed by each subsystem. It is not the intent of this documentation to describe the individual programs that support these functions.
- 2) The Software Functional Design submittal shall include, but not be limited to, the following items for each subsystem:
  - A. Subsystem Abstract - A brief overview of the subsystem which shall describe its major functions.
  - B. Technical Description - A description of all the functions to be performed by the subsystem. This description shall indicate how the functions work from a user's standpoint.

- C. Subsystem Structure - A diagram of the overall subsystem indicating major modules, data structures and data flow. It shall also be defined whether the function is performed in the central system, a remote unit or both.
  - D. Interface Structure - A diagram and/or description of the manner in which the subsystem interfaces with other subsystems.
  - E. Man-Machine Interface Consideration - A detailed description of all interface between the system and the operator shall be provided. All related CRT formats shall be shown.
  - F. Initialization Considerations - A description of the impact of power fail or system failover type restarts upon the subsystem shall be described.
- 3) The Software Functional Design Documentation shall also include a functional description of all support software as described in this Specification. As with the previous subsystems, this Software Functional Design submittal shall describe what functions are performed by each software support subsystem. This documentation shall describe what functional subsystems and data bases are affected by each support software subsystems.
  - 4) This software submittal shall not cover the detailed control algorithms, plant reports, or process graphic displays. These shall be included in a subsequent submittal after the system supplier has met with the Engineer and Owner and developed the specifics of these for the plant.

#### Specific Digital System Applications

- 1) This submittal shall cover the specific plant control schemes as well as the details of the plant reports and process graphic displays that the system supplier has previously developed through meetings with the Engineer and Owner.
- 2) Any functional part of any loop that is implemented in software may either be shown on the same loop connection diagram or on a separate supplemental "loop software diagram". In either case, software diagramming shall be provided for each loop included herein. The software diagramming and the actual program shall be cross referenced and well annotated.

Symbology for software diagramming shall utilize one of the following methods. (Note this may or may not be the actual programming language used):

- A. a. Ladder Diagram Format - this method may be used for programmable controllers only. The use of ladder diagrams to show logic in computer or microprocessors that cannot be programmed in ladder logic is not acceptable. Ladder diagram formats which depict analog control functions or which utilize subroutines, special programming control blocks, etc, shall be further described utilizing one of the following formats (formats b through e) as is applicable.
- B. Flow Chart Format - this method shall utilize symbology and conventions set forth in ANSI X3.5.
- C. Binary Logic Format - this method shall utilize the symbology and conventions set forth in ISA Standard S5.2. (Latest Edition).
- D. Structured Logic Format - this method shall utilize structured logic statements; if/and, and/or, etc.



- E. Graphic Symbolic Representation Format - Symbolic representation of functions of digital systems shall be as set forth in ISA Standard S5.3.
- 3) Included with each diagram shall be:
- A. Brief description of the Control Function.
  - B. Listing of all scanned inputs to the control function.
  - C. A short narrative of the control strategy.
  - D. Any assumptions made in developing the program.
  - E. Listing of all outputs (i.e., AO, DO) from the control function.
  - F. Listing of all operator inputs/outputs to and from the control function. Any special CRT displays related to the function shall be illustrated. A description of the operation of any panels shall be described as it relates to the control function.
  - G. Failure contingencies shall be described in detail.
  - H. Cross references to appropriate loop drawings and other programs.
- 4) The specifics of the logs, reports and process graphic displays shall be developed by the system supplier in conjunction with the Engineer and Owner. The types and quantities are described in the Specification. The specifics of what shall appear on each and what calculations are required to support them shall be developed and submitted in final printed form for approval.

## 5. Reference Standards

- 1) American Society for Testing and Materials (ASTM).
  - A. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- 2) Instrument Society of America (ISA)
  - A. ISA S5.2 - Binary Logic Diagrams for Process Operations
  - B. ISA S5.3 - Graphic Symbols for Distributed Control/Shared Display Instrumentation Logic and Computer Systems.
  - C. ISA S5.4 - Instrument Loop Diagrams
  - D. Display Instrumentation Logic and Computer Systems
- 3) American National Standards Institute (ANSI)
  - A. ANSI X3.5 - Flowchart Symbols and Their Usage in Information Processing
- 4) National Electrical Manufacturers Association (NEMA)

Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

## 6. Delivery, Storage, and Handling

Shipping Precautions

- 1) After completion of shop assembly, factory test and approval all equipment, cabinets, panels and consoles shall be packed in protective crates and enclosed in heavy duty polyethylene envelopes or secured sheeting to provide complete protection from damage, dust and moisture. Dehumidifiers shall be placed inside the polyethylene coverings. The equipment shall then be skid-mounted for final transport. Lifting rings shall be provided for moving without removing protective covering. Boxed weights shall be shown on shipping tags together with instructions for unloading, transporting, storing and handling at job site.
- 2) Special instructions for proper field handling, storage and installation required by the manufacturer for proper protection, shall be securely attached to the packaging for each piece of equipment prior to shipment. The instructions shall be stored in resealable plastic bags or other acceptable means of protection.

#### Identification

- 1) Each component shall be tagged to identify its location, tag number and function in the system. Identification shall be prominently displayed on the outside of the package.
- 2) A permanent stainless steel or other non-corrosive material tag firmly attached and permanently and indelibly marked with the instrument tag number, as given in the tabulation, shall be provided on each piece of equipment supplied under this Section.

#### Storage

- 1) Equipment shall not be stored out-of-doors. Equipment shall be stored in dry permanent shelters including in-line equipment and shall be adequately protected against mechanical injury. If any apparatus has been damaged, such damage shall be repaired by the Contractor at his/her own cost and expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through such tests as directed by the Engineer. This shall be at the cost and expense of the Contractor, or the apparatus shall be replaced by the Contractor at his/her own expense.

### **7. Maintenance**

#### *Tools*

A complete set special tools, cables, gender adapters and PC software shall be furnished with the equipment as necessary for the Owner to operate, test, program and maintain the control systems. Standard mechanical hand tools and Windows PC Laptop will be provided by the Owner.

#### *Test Equipment*

A list of suggested test equipment and estimated costs shall be provided to the Engineer if they are specific to the job, have value for normal operation and maintenance procedures and may not be easily or locally available.

#### *Spare Parts*

A list of suggested spare parts (including fuses) and their estimated costs shall be provided to Engineer which are specific to the job, has value for normal operation and maintenance procedures and may not be easily or locally available.

### **8. Instrumentation General**

### *Type*

All instrumentation supplied shall be of the manufacturer's latest design and shall produce or be activated by signals which are established standards for the water and wastewater industries.

All electronic instrumentation shall be of the solid-state type and shall utilize linear transmission signals of 4 to 20 ma dc (milliamp ere direct current), however, signals between instruments within the same panel or cabinet may be 1-5V dc (volts direct current), or the like.

Outputs of equipment that are not of the standard signals as outlined, shall have the output immediately raised and/or converted to compatible standard signals for remote transmission. No zero based signals will be allowed.

All instruments shall be provided with mounting hardware and floor stands, wall brackets, or instrument racks as shown on the Drawings or as required.

Equipment installed in a hazardous area shall meet Class, Group, and Division as shown on the Electrical Drawings, to comply with the National Electrical Code.

All indicators and recorder readouts shall be linear in process units, unless otherwise noted.

All transmitters shall be provided with either integral indicators or conduit mounted indicators in process units, accurate to two percent.

Electronic equipment shall be of the manufacturer's latest design, utilizing printed circuitry and suitably coated to prevent contamination by dust, moisture and fungus. Solid state components shall be conservatively rated for their purpose, to assure optimum long term performance and dependability over ambient atmosphere fluctuations and 0 to 100 percent relative humidity. The field mounted equipment and system components shall be designed for installation in dusty, humid and slightly corrosive service conditions.

All equipment, cabinets and devices furnished hereunder shall be heavy-duty type, designed for continuous industrial service. The system shall contain products of a single manufacturer, in-so-far as possible and shall consist of equipment models which are currently in production. All equipment provided shall be of modular construction and shall be capable of field expansion.

The field mounted digital system equipment and system components shall be designed for installation in dusty, humid and slightly corrosive service conditions.

All electronic/digital equipment shall be provided with radio frequency interference protection and shall be FCC approved.

### *Electrical*

All equipment, except for actuated valves, shall be designed to operate on a 60 Hertz alternating current power source at a nominal 117 volts, plus or minus 10 percent, except where specifically noted. Actuated valves shall be designed to operate from 480 V, 3 phase, 60 Hertz power. All regulators and power supplied required for compliance with the above shall be provided between power supply and interconnected instrument loop. Where equipment requires voltage regulation, constant voltage transformers shall be supplied.

Materials and equipment used shall be U.L. approved wherever such approved equipment and materials are available.

All equipment shall be designed and constructed so that in the event of a power interruption, the equipment specified hereunder shall resume normal operation without manual resetting when power is restored.

## **9. Lightning/Surge Protection**

General - Lightning/Surge protection shall be provided to protect the electronic instrumentation system from induced surges propagating along the signal and power supply lines. The protection systems shall be such that the protective level shall not interfere with normal operation, but shall be lower than the instrument surge withstand level and be maintenance free and self-restoring.

Instruments shall be housed in a suitable metallic case, properly grounded. Ground wires for all surge protectors shall be connected to a good earth ground and where practical each ground wire run individually and insulated from each other. These protectors shall be mounted within the instrument enclosure or a separate NEMA 4 junction box coupled to the enclosure.

Power Supply - Protection of all 120 VAC instrument power supply lines shall be provided.

Cabinet(s)/panel(s) and groups of field instruments regardless of location (indoor or outdoor), shall be protected by UL-listed isolation transformers and three-stage LTSS with combination gas tube and zener diode devices. Individual field instruments shall be protected by individual 120VAC three-stage LTSS devices. Transient protection shall be provided for line to line and line to ground protection. Maximum withstand ratings shall be coordinated with the electrical service entrance surge arrestors. Transformers shall be GE, SOLA, or equal. LTSS devices shall be Phoenix Contact, Joslyn, MCG Electronics, or equal.

Signal Line - All signal lines when they enter or leave a building shall be protected through the use of UL-listed two-stage LTSS devices containing gas tube surge arrestors, inductor filters, and transorb diode protectors. Panel protectors shall be track-mounted. Field protectors shall be conduit-mounted. These shall be provided at both ends of the signal lines and as close to the instruments as possible. Devices shall be Phoenix Contact, Joslyn, Rosemount, EDCO, Weidmueller, or equal.

## **10. Other Products**

See CS 13315 for other instrumentation product specifications.

## **11. Control Panels, Enclosure, and Cabinets**

The following Paragraphs describe general fabrication requirements of control panels, enclosures, consoles and cabinets.

- 1) Pneumatic Tubing
  - A. None used.
- 2) Wiring
  - A. All interconnecting wiring, except for electronic circuits, shall have 600 volt insulation and rated for not less than 90 degrees C.
  - B. Power distribution wiring on the line side of fuses shall be 12 AWG minimum. Control wiring on the secondary side of fuses shall be 14 AWG minimum. Electronic analog circuits shall utilize 16 AWG shielded, twisted pair, cable insulated for not less than 300 volts.
  - C. Power and low voltage dc wiring systems shall be routed in separate wireways. Crossing of different system wires shall be at right angles. Different system wires

routed parallel to each other shall be separated by at least 12-in. Different wiring systems shall terminate on separate terminal blocks. Wiring troughs shall not be filled to more than 60 percent visible fill.

- D. All wiring shall terminate in a master terminal board, rigid type and numbered. The master terminal board shall have a minimum of 25 percent spares. Terminal blocks shall be arranged in vertical rows and separated into groups. (Power, AC control, DC signal, alarm, and graphic). Terminal blocks shall be barrier type with the appropriate voltage rating (600 volts minimum). They shall be the raised channel mounted type. Wire connectors shall be the hook fork type with non-insulated barrel for crimp type compression connection to the wire. Wire and tube markers shall be the sleeve type with heat impressed letters and numbers. Direct interlock wiring between equipment will not be allowed. Only one side of a terminal block row shall be used for internal wiring. The field wiring side of the terminal shall not be within 6-in of the side panel or adjacent terminal.
- E. All wiring to hand switches and the like which are live circuits independent of the panel's normal circuit breaker protection shall be clearly identified as such.
- F. All wiring shall be clearly tagged and color coded. All tag numbers and color coding shall correspond to the panel wiring diagrams and loop drawings. All power wiring, control wiring, grounding and dc wiring shall utilize different color insulation for each wiring system used.
- G. Each control loop or system shall be individually protected by fuses or breakers. All protecting devices shall be clearly labeled and located for ease of maintenance.
- H. Provide surge protectors on all incoming power supply lines at each panel.

### 3) Equipment Mounting/Arrangement

- A. All components shall be mounted in a manner that shall permit servicing, adjustment, testing and removal without disconnecting, moving or removing any other component. Components mounted on the inside of panels shall be mounted on removable plates and not directly to the enclosure. Mounting shall be rigid and stable unless shock mounting is required otherwise by the manufacturer to protect equipment from vibration. Components mounting shall be oriented in accordance with the internal components shall be identified with suitable plastic or metal engraved tags attached with drive pins adjacent to (not on) each component identifying the component in accordance with the drawing, specifications and supplier's data.
- B. All exterior panel mounted equipment shall be installed with suitable gaskets, faceplates, etc, required to maintain the NEMA rating of the panel.

### 4) Nameplates

- A. All panels shall be supplied with suitable nameplates which identify the panel and individual devices as required.

### 5) Painting

- A. All sections shall be descaled, degreased, filled, ground and finished. The enclosure when fabricated of steel shall be finished with two rust resistant phosphate prime coats

and two coats of enamel, polyurethane, or lacquer finish which shall be applied by either the hot air spray or conventional cold spray methods. Brushed anodized aluminum, stainless steel and FRP panels will not require a paint finish.

- 6) Freestanding Vertical Panels, Wall or Unistrut Mounted Cabinets, or Computer Consoles
  - A. All assemblies shall be Underwriters Laboratories (UL) listed and approved.
  - B. The instrumentation shall be housed in a dust-proof and waterproof NEMA 4X, Type 304, 14 Gauge stainless steel enclosure powder coated white, with a 304 stainless steel, lockable three-point handle-type latching mechanism. All exterior hardware and hinges shall be stainless steel.
  - C. A 14 gauge aluminum back-panel will be provided to mount all electrical control devices. All interior electrical control components mounted on the back-panel will be secured using stainless steel machine screws 8-32 minimum size. Heavier items including the RTU, control power transformer and items in excess of 10 pounds will be secured with 1/4"-20 stainless steel machine screws. Screw anchor nuts will be permanently installed in the sub-panel using cadmium plated steel knurled threaded inserts AKV Model AKS7 or equal. No self-tapping sub-panel tapped screws will be used.
  - D. All wiring to the control devices within the RTU panel will be harnessed and permanently attached to the panel using welded 8-32 studs and stud mounted cable ties. Stick on tie wrap fasteners are not acceptable. Wiring will be supported every 8 inches minimum. This panel will be grounded via a 10-32 stud located in the bottom hinged side and bonded to the enclosure and ground buss.
  - E. There shall be a permanently affixed document pocket on the interior side of the exterior enclosure door to include a laminated wiring diagram, and bill of materials.
  - F. No devices or equipment shall be mounted to the top of the control panel enclosure, exclusive of radio antenna.
  - G. The enclosure, sub-panel, and dead front operator panel will all be painted with heat fused polyester powder, electrostatically applied paint on a phosphatized base. The enclosure will be white, inside and outside. The interior panels will be silver-tek bronze.
  - H. All components will be able to operate at -22 F or lower to 140 F and higher at 95% humidity
  - I. Panels shall be provided with full length rear doors or front access doors as shown on the panel details. Full length rear access door shall be not greater than 24-in in width. Front access doors with mounted instruments or control devices shall be of sufficient width to permit door opening without interference from flush mounted instruments. All doors shall be mounted with strong, continuous, piano type hinges and be provided with lockable door handles and three point latches.
  - J. Approximate size and equipment layout is shown on the panel details.
  - K. Print storage pockets shall be provided on the inside of each panel. Its size shall be of sufficient size to hold al of the prints required to service the equipment. Reduced drawings shall be provided to be stored in these pockets.

## 12. General Installation

Instrumentation and accessory equipment shall be installed in accordance with the manufacturer's instructions. The locations of equipment, transmitters, alarms and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. Obtain in the field all information relevant to the placing of process control work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

The instrumentation loop diagrams indicate the intent of the interconnection between the individual instruments. Any exceptions should be noted. Two complete sets of approved shop drawings shall be kept at the job site during all on-site construction. Both sets shall be identically marked up to reflect any modifications made during field installation or start-up. All markings shall be verified and initialed by the Engineer or his/her designated representative.

Following completion of installation and the operational readiness test, one set of the marked up drawings shall be provided to the Engineer, the other retained by the supplier for incorporation of the mark-ups into final as-built documentation.

The instrumentation installation details on the Drawings indicate the designed installation for the instruments specified. Where specific installation details are not specified or shown on the Drawings, the American Petroleum Institute (API) Recommended Practice 550 shall be followed as applicable.

All work shall be executed in full accordance with codes and local rulings. Should any work be performed contrary to said rulings, ordinances and regulations, the Contractor shall bear full responsibility for such violations and assume all costs arising therefrom.

All equipment used in areas designated as hazardous shall be designed for the Class, Group and Division as required on the Electrical Drawings for the locations. All work shall be in strict accordance with codes and local rulings, should any work be performed contrary to said rulings, ordinances and regulations, the supplier shall bear full responsibility for such violations and assume all costs arising there from.

Unless specifically shown in the Drawings, direct reading or electrical transmitting instrumentation shall not be mounted on process piping. Instrumentation shall be mounted on instrument racks or stands as detailed on the installation detail drawings. All instrumentation connections shall be provided with shutoff and drain valves. For differential pressure transmitters, valve manifolds for calibration, testing and blow down service shall also be provided. For slurries, chemical or corrosive fluids, diaphragm seals with flushing connections shall be provided.

All piping to and from field instrumentation shall be provided with necessary unions, test tees, couplings, adaptors and shut-off valves.

Field instruments requiring power supplies shall be provided with local electrical shutoffs and fuses as required.

Brackets and hangers required for mounting of equipment shall be provided. They shall be installed in a workmanlike manner and not interfere with any other equipment.

The system supplier shall investigate each space in the building through which equipment must pass to reach its final location. If necessary, the system supplier shall be required to ship his/her material in sections sized to permit passing through restricted areas in the building. The system supplier shall also investigate, and make any field modifications to the allocated space for each cabinet, enclosure and panel to assure proper space and access (front, rear, side).

The shield on each process instrumentation cable shall be continuous from source to destination and be grounded as directed by the manufacturer of the instrumentation equipment but in no case shall more than one ground point be employed for each shield.

Lifting rings from cabinets/assemblies shall be removed. Hole plugs shall be provided for the holes of the same color as the cabinet.

The system supplier, acting through the Contractor, shall coordinate the installation, the placing and location of system components, their connections to the process equipment panels, cabinets and devices, subject to the Engineer's approval. He/She shall be responsible to insure that all field wiring for power and signal circuits are correctly done in accordance with best industry practice and provide for all necessary system grounding to insure a satisfactory functioning installation.

### **13. Test (General)**

The supplier shall test all equipment at the factory prior to shipment. Unless otherwise specified in the individual specification sections, all equipment provided by the supplier shall be tested at the factory as a single fully integrated system.

As a minimum, the testing shall include the following:

- 1) Unwitnessed Factory Test (UFT).
- 2) Operational Readiness Tests (ORT).
- 3) Functional Demonstration Tests (FDT).
- 4) 30-Day Acceptance Tests

Each test shall be in the cause and effect format. The person conducting the test shall initiate an input (cause) and upon the system's or subsystem's producing the correct result (effect), the specific test requirement will have been satisfied.

All tests shall be conducted in accordance with prior Engineer- approved procedures, forms and checklist. Each specific test to be performed shall be described and a space provided after it for signoff by the appropriate party after its satisfactory completion.

Copies of these signoff test procedures, forms and checklists will constitute the required test documentation.

Provide all special testing materials and equipment. Wherever possible, perform tests using actual process variables, equipment, and data. Where it is not practical to test with real process variables, equipment and data, provide suitable means of simulation. Define these simulations techniques in the test procedures.

The Contractor shall require the supplier to coordinate all of his/her testing with him, all affected Subcontractors and the Owner.

The Engineer reserves the right to test or retest all specified functions whether or not explicitly stated in the prior approved Test Procedures.

The Engineer's decision shall be final regarding the acceptability and completeness of all testing.

No equipment shall be shipped until the engineer has received all test results and approved the system is ready for shipment.



The supplier shall furnish the services of servicemen, all special calibration and test equipment and labor to perform the field tests.

#### **14. Unwitnessed Factory Tests (UFT)**

The entire system except for primary elements, final control elements, and field mounted transmitters shall be interconnected and tested to ensure the system will operate as specified. All analog and discrete input/output points not interconnected at this time shall be simulated to ensure proper operation of all alarms, monitoring devices/functions and control devices/functions. All panels, consoles and assemblies shall be inspected and tested to verify that they are in conformance with related submittals, Specifications and Drawings.

During the tests all digital system hardware and software shall be operated for at least five days continuously without a failure to verify the system is capable of continuous operation.

#### **15. Operational Readiness Tests (ORT)**

General: Prior to startup and the Functional Acceptance Test, the entire system shall be certified (inspected, tested and documented) that it is READY for operation.

Loop/Component Inspections and Tests: The entire system shall be checked for proper installation, calibrated and adjusted on a loop-by-loop and component-by-component basis to ensure that it is in conformance with related submittals and these Specifications.

- 1) The Loop/Component Inspections and Tests shall be implemented using Engineer-approved forms and checklists.
  - A. Each loop shall have a Loop Status Report to organize and track its inspection, adjustment and calibration. These reports shall include the following information and check off items with spaces for signoff by the system supplier:
    1. Project Name.
    2. Loop Number.
    3. Tag Number for each component.
    4. Check offs/signoffs for each component.
      - Tag/identification
      - Installation
      - Termination - wiring
      - Termination - tubing
      - Calibration/adjustment
    5. Check offs/signoffs for the loop.
      - Panel interface terminations
      - I/O interface terminations
      - I/O signal operation
      - Inputs/outputs operational: received/sent, processed, adjusted
      - Total loop operation

6. Space for comments.
- B. Each active Analog Subsystem element and each I/O module shall have a Component Calibration Sheet. These sheets shall have the following information, spaces for data entry and a space for signoff by the system supplier:
1. Project Name.
  2. Loop Number.
  3. Component Tag Number of I/O Module Number.
  4. Component Code Number Analog System.
  5. Manufacturer (for Analog system element).
  6. Model Number/Serial Number (for Analog system).
  7. Summary of Functional Requirements. For example:
    - For Indicators and Recorders: Scale and chart ranges
    - For Transmitters/Converters: Scale and chart ranges
    - For Computing Elements: Function
    - For Controllers: Action (direct/reverse) control modes (PID)
    - For Switching Elements: Unit range, differential (FIXED/ADJUSTABLE), reset (AUTO/MANUAL)
    - For I/O Modules: Input or output
  8. Calibrations; for example:
    - For Analog Devices: Required and actual inputs and outputs at 0, 10, 50 and 100 percent of span, rising and falling.
    - For Discrete Devices: Required and actual trip points and reset points.
    - For Controllers: Mode settings (PID).
    - For I/O Modules: Required and actual inputs or outputs for 0, 10, 50 and 100 percent of span, rising and falling.
  9. Space for comments.
  10. Space for signoff by the system supplier.
- 2) The Contractor shall require the system supplier to maintain the Loop Status Reports and Components Calibration sheets at the jobsite and make them available to the Engineer/Owner at any time.
  - 3) These inspections and tests do not require witnessing. However, the Engineer will review and initial all Loop Status Sheets and Component Calibration Sheets and spot-check their entries periodically and upon completion of the Operational Readiness Tests. Any deficiencies found shall be corrected.

## 16. Functional Acceptance Test

Prior to startup and the Functional Acceptance Test, the entire installed instrument and control system shall be certified that it is ready for operation. All preliminary testing, inspection, and calibration shall be complete as defined in the operational readiness tests.

Once the facility has been started up and is operating, a witnessed Functional Acceptance Test shall be performed on the complete system to demonstrate that it is operating and in compliance with these Specifications. Each specified function shall be demonstrated on a paragraph-by-paragraph, loop-by-loop, and site-by-site basis.

Loop-specific and non-loop-specific tests shall be the same as specified under Factory Demonstration Tests except that the entire installed system shall be tested and all functions demonstrated.

Updated versions of the documentation specified to be provided for during the Factory Tests shall be made available to the Engineer at the jobsite both before and during the tests. In addition, one copy of all O & M Manuals shall be made available to the Engineer at the jobsite both before and during testing.

The daily schedule specified to be followed during the Factory Tests shall also be followed during the Functional Acceptance Testing.

The system shall operate for a continuous 100 hours without failure before this test will be considered successful.

### **17. 30-Day Acceptance Test**

After completion of the Operational Readiness Tests, the System Supplier shall be responsible for operation of the entire system for a period of 30 consecutive days, under conditions of full plant process operation, without a single non-field repairable malfunction.

During this test, plant operating and supplier personnel shall be present as required. The supplier is expected to provide personnel for this test who have an intimate knowledge of the hardware and software of the system.

While this test is proceeding, the Owner shall have full use of the system. Only plant operating personnel shall be allowed to operate equipment associated with live plant processes.

Any malfunction during the tests shall be analyzed and corrections made by the system supplier. The Engineer and/or Owner will determine whether any such malfunctions are sufficiently serious to warrant a repeat of this test.

Any malfunction, during this 30 consecutive day test period, which cannot be corrected within 24 hours of occurrence by the Supplier's personnel, or more than two similar failures of any duration, will be considered as a non-field-repairable malfunction.

Upon completion of repairs, by the system supplier, the test shall be repeated as specified herein.

In the event of rejection of any part or function, perform repairs or replacement within 90 days.

All data base errors must be corrected prior to the start of each test period. The 30 day test will not be considered successful until all data base is correct.

The total availability of the system shall be greater than 99.5 percent during this test period. Availability shall be defined as "Avail. = ((Total Time-Down Time) ÷ Total Time) x 100".

Down times due to power outages or other factors outside the normal protection devices or backup power supplies provided, shall not contribute to the availability test times above.

Upon successful completion of the 30 day operation test and subsequent review and approval of complete system final documentation, the system shall be considered substantially complete and the one year warranty period shall commence.

## **18. Training**

Contractor shall provide onsite training as recommended by manufacturer. Training shall be conducted by a qualified manufacturer representative for up to 16 hours.

The cost of training programs to be conducted with Owner's personnel shall be included in the Contract price. The training and instruction, insofar as practicable, shall be directly related to the system being supplied.

The supplier shall provide detailed manuals to supplement the training courses. The manuals shall include specific details of equipment supplied and operations specific to the project.

The supplier shall make use of teaching aids, manuals, slide/video presentations, etc. After the training services, such materials shall be delivered to Owner.

The training program shall represent a comprehensive program covering all aspects of the operation and maintenance of the system.

All training schedules shall be coordinated with, and at the convenience of the Owner. Shift training may be required to correspond to the Owner's working schedule.

## **19. Warranty/Preventative Maintenance**

A written maintenance contract executed by the supplier shall be provided to the Owner for on-site warranty and preventive maintenance services. This maintenance contract shall include all labor, parts, and emergency calls providing on-site response within 24 hours, to provide complete system maintenance for a period of one year after the date of final acceptance of the system.

## **20. Control System Diagrams and Details**

To assist the system supplier in determining the scope of work, a series of loop diagrams and details are provided. Unless specifically stated otherwise, the system supplier shall be responsible for providing all instrumentation, control equipment and auxiliary devices necessary to perform the functions specified herein and as shown and described on these diagrams. Any auxiliary devices such as lightning/surge protectors, relays, timers, signal isolators, signal boosters, etc, which are necessary for complete operation of the system, or to perform the functions specified shall be included, whether or not they are specifically shown or tabulated on the loop diagrams.

The intent of the loop diagrams is to describe in as much detail as possible, the hardware, software and functional requirements of a process measurement or control system. They are not intended to convey requirements for conduit and wiring between panels or system components. This information is included in appropriate electrical specifications and Drawings.

## **Electrical Specification 13315 – Pump Instrumentation and Controls - Products**

### **1. Scope**

This section covers the furnishing, installation, and services for the following major systems, panels and subassemblies:

- 1) Control/Monitoring Systems
  - A. One PLC based control system.
  - B. Two soft start motor controls.
  - C. Two Level sensors and two-level switches.

Refer to Instrumentation General Provisions, ES 13300.

### **2. Related Work**

Refer to ES 13300 for General Provisions

Refer to ES 13330 for PLC Software

### **3. Submittals**

Refer to ES 13300.

### **4. Reference Standards**

Refer to ES 13300.

### **5. Quality Assurance**

Refer to ES 13300.

### **6. Maintenance and Test Equipment**

Refer to ES 1330

### **7. Field Mounted Instruments**

Weighted Float Type Level Switches

- 1) Type:
  - A. The switch assembly shall be weighted and suspended on its own cable.
  - B. Mercury switch
- 2) Functional/Performance:
  - A. Temperature Rating - 0 to 50 degrees C
  - B. Contact Rating - Up to 250V AC/DC, and 8 amps AC, 5 amps DC.
  - C. Contact Arrangement - Form C contact which is field selectable normally open or closed.
  - D. Angular Operating Differential - 20 degrees.
  - E. Vertical Operating Differential - 1/2-inch.

- 3) Physical:

- A. Contact - Sealed mercury switch housed in a chemical-resistant polypropylene casing.
- B. Flexible Support Cable - Synthetic three wire cable, minimum 19 AWG wire.
- C. Specific Gravity - Match to fluid being measured.

4) Options/Accessories Required:

- A. Provide flexible support cable of sufficient length to ensure no splice or connection is required in the basin.
- B. Provide junction box inside the stilling well for connection of cable.
- C. Provide stainless steel supports/mounting accessories as required.
- D. Support bracket with adjustable clamp for setting switch height.

5) Manufacturers:

- A. FLYGT Model ENH-10.
- B. Or equal.

#### 4-20 ma Liquid Level Sensors

1) Type:

- A. The Level Sensor assembly shall be field mounted in a PVC wet well specifically provided for the sensor
- B. 4-20 ma submersible sensor

2) Functional/Performance:

- A. Temperature Rating - 0 to 50 degrees C

3) Physical:

- A. Contact - Sealed housed in a chemical-resistant polypropylene or stainless steel casing.
- B. Flexible Support Cable - Synthetic wire cable, minimum 19 AWG wire.

4) Options/Accessories Required:

- A. Provide flexible support cable of sufficient length to ensure no splice or connection is required in the basin.
- B. Provide junction box inside the stilling well for connection of cable.
- C. Provide stainless steel supports/mounting accessories as required.
- D. Support bracket with adjustable clamp for setting sensor height.

5) Manufacturers:

- A. FLYGT or equal.

### 8. Miscellaneous Panel Components

#### Pilot Type Indicating Lights

1) Type:

- A. Heavy duty oil tight type which utilizes a low voltage lamp.

- 2) Functional/Performance:
  - A. Units shall be provided with low voltage lamps suitable for the voltage supplied. Lights supplied with 120V AC power shall have integral reduced voltage transformers.
  - B. Lamps shall be replaceable from the front of the unit.
- 3) Physical:
  - A. Lens color shall be as indicated on the instrument device schedule. Lens shall be approximately 1-1/4-in in diameter.
  - B. Provide legend faceplates engraved to indicate the required function of each device.
  - C. Units shall be rated NEMA 13 for indoor panels. Units located outdoors or indicated to be weatherproof shall be rated NEMA 4X.
- 4) Manufacturers:
  - A. Square D
  - B. Micro switch
  - C. Allen Bradley
  - D. General Electric

#### Rotary Hand Switches and Pushbuttons

- 1) Type:
  - A. Control devices shall be heavy duty oil tight type with stackable contact blocks.
- 2) Functional/Performance:
  - A. Provide contact arrangement and switching action as required for the control system specified.
- 3) Physical:
  - A. For 120V AC service provide contacts rated 10 amps at 120V AC, for 24V DC service provide silver sliding contacts rated 5 amps at 125V DC, for electronic (millivolt/milliamp) switching provide contacts rated lamp at 28V DC.
  - B. Pushbuttons shall have flush type operators. Selector switches shall have knob or wing lever operators.
  - C. Units shall be rated NEMA Type 13 for indoor service. Units located outdoors or indicated to be weatherproof shall be rated NEMA 4X.
  - D. Provide legend plates denoting switch/pushbutton position/ function.
- 4) Options/Accessories Required:
  - A. Provide lock-out-pushbuttons, key-operators, etc, as indicated on the instrument device schedule.
  - B. Provide make-before-break bridging contacts where required.
- 5) Manufacturers:
  - A. Square D

- B. Micro switch
- C. Allen Bradley
- D. General Electric

#### Square Type Selector Switches and Multilight Indicators

- 1) Type:
  - A. Selector switches and indicators shall be of the illuminated, multiple lamp, oil tight type with square shape display windows and removable contact blocks.
- 2) Functional/Performance:
  - A. Provide contact arrangement as required for the control system specified.
- 3) Physical:
  - A. For 120V AC service provide contacts rated 10 amps at 120V AC, for 24V DC circuits provide silver sliding contacts rated 5 amps at 125V DC, for electronic (Millivolt/Milliamp) switching duty provide gold plated sliding contacts rated lamp at 28V DC.
  - B. Units shall be approximately 2-1/2-in square and shall be divided into as many as four separate lightable quadrants.
  - C. Indicating lights used with 120 volt control power shall be provided with an integral transformer to reduce the voltage.
  - D. Provide legend plates, color inserts and cover plates to indicate the required function.
- 4) Manufacturers:
  - A. Square D
  - B. Micro switch type CMC

#### Industrial Relays and Time Delays

- 1) Type:
  - A. Industrial heavy duty relays.
- 2) Functional/Performance:
  - A. Contact arrangement/function shall be as required to meet the specified control function specified.
  - B. Contacts shall be rated 10 amps continuous at 600 volts.
  - C. Relays shall be provided with convertible contact blocks.
  - D. Pneumatic time delay relays shall be used on time delays less than 180 seconds and shall be adjustable.
  - E. Solid state time delay relays shall be used on time delays between 180 seconds and one-hour.
- 3) Options/Accessories Required:



- A. Provide all mounting rails, etc, that are required.
- 4) Manufacturers:
  - A. Square D
  - B. Allen Bradley

#### General Purpose Relays and Time Delays

- 1) Type:
  - A. Units shall be of the general purpose plug-in type.
- 2) Functional/Performance:
  - A. Coil voltage shall match supply voltage.
  - B. Contact arrangement/function shall be as required to meet the specified control function.
  - C. Mechanical life expectancy shall be in excess of 10 million.
  - D. Duty cycle shall be rated for continuous operation.
  - E. Units shall be provided with integral indicating light to indicate if relay is energized.
  - F. Solid state time delays shall be provided with polarity protection (DC units) and transient protection.
  - G. Time delay units shall be adjustable and available in ranges from .1 second to 4.5 hours.
- 3) Physical:
  - A. For 120V AC service provide contacts rated 10 amps at 120V AC, for 24V DC service provide contacts rated 5 amps at 28V DC, for electronic (milliamp/millivolt) switching applicator provide gold plated contacts rated for electronic service.
  - B. Relays shall be provided with dust and moisture resistant covers.
- 4) Options/Accessories Required:
  - A. Provide mounting sockets with pressure type terminal blocks rated 300 volt and 10 amps.
  - B. Provide mounting rails/holders as required.
- 5) Manufacturers (or equal):
  - A. Square D
  - B. Eagle signal controls
  - C. Allen Bradley
  - D. Potter & Brumfield

#### Signal Relay Switches (Current Trips)

- 1) Type:

- A. Solid state electronic type.
- 2) Functional/Performance:
  - A. Input - 4-20 mA
  - B. Output - Isolated contact output, double pole double throw, rated 5 amps at 120V AC.
  - C. Accuracy - 0.1 percent.
  - D. Protection - Provide RFI protection.
  - E. Deadband - Adjustable between 0.1 and 5.0 percent of span.
  - F. Set point Adjustment - Provide graduated dial for each alarm set point from 0 to full scale. Alarms shall be adjustable to trip on rising or falling input signal.
  - G. Repeatability - Trip point repeatability shall be at least 0.1 percent of span.
- 3) Physical:
  - A. Mounting - Suitable for mounting in an enclosure or high density instrument rack.
- 4) Options/Accessories Required:
  - A. Mounting rack or general purpose enclosure as required.
- 5) Manufacturers (or equal):
  - A. Moore Industries
  - B. Rochester Instrument Systems
  - C. Acromag Inc.

#### Signal Isolators/Boosters/Converters

- 1) Type:
  - A. Solid state electronic type.
- 2) Functional/Performance:
  - A. Accuracy - 0.15 percent.
  - B. Inputs - Current, voltage, frequency, temperature, or resistance as required.
  - C. Outputs - Current or voltage as required.
  - D. Isolation - There shall be complete isolation between input Circuitry, output circuitry, and the power supply.
  - E. Adjustments - Zero and span adjustment shall be provided.
  - F. Protection - Provide RFI protection.
- 3) Physical:
  - A. Mounting - Suitable for mounting in an enclosure or instrument rack.
- 4) Options/Accessories Required:
  - A. Mounting rack or general purpose enclosure as required.

- 5) Manufacturers (or equal):
  - A. Moore Industries
  - B. Rochester Instrument Systems
  - C. Acromag Inc.

#### Signal Selectors, Computation, and Conditioning Relays

- 1) Type:
  - A. Solid state electronic type.
- 2) Functional/Performance:
  - A. Inputs - 4-20 mA
  - B. Outputs - 4-20 mA
  - C. Protection - Provide RFI protection.
  - D. Operation - The relay shall multiply, add, subtract, select, extract the square root, or perform the specified conditioning/computation function required. All inputs shall be able to be individually rescaled and biased as required.
  - E. Isolation - All inputs, outputs, and power supplies shall be completely isolated.
  - F. Accuracy - 0.35 percent of span.
  - G. Adjustments - Multiturn potentiometer for zero, span, scaling, and biasing.
- 3) Physical:
  - A. Mounting - Suitable for mounting in an enclosure or instrument rack.
- 4) Options/Accessories Required:
  - A. Mounting rack or general purpose enclosure as required.
- 5) Manufacturers:
  - A. Moore Industries
  - B. Rochester Instrument Systems
  - C. Acromag Inc.

#### Intrinsically Safe Relays

- 1) Type:
  - A. Relays shall be of the solid state electronic type in which the energy level of the sensing or actuation circuit is low enough to allow safe usage in hazardous areas.
- 2) Options/Accessories Required:
  - A. Relays shall match power supply provided.
  - B. Relays shall be located in non-hazardous areas.
- 3) Manufacturers (or equal):
  - A. Consolidated Electric

- B. Gems Safe-Pak
- C. Warrick Controls
- D. R. Stahl, Inc.

## **9. Soft Start Motor Controls**

Each \*75 HP electric pump motor shall be operated and protected by a solid state soft start motor starter. (\*Contractor shall verify motor HP and specifications with pump manufacturer before purchasing control system.)

The soft start shall consist of hardwire I/O and an interface compatible with the proposed PLC.

Soft start shall be suitable for a 120V single phase control power supply. It also shall be provided with a main circuit breaker and TVSS.

Manufacturer: Square D or equal

## **10. Programmable Logic Controllers**

The pump control station will include a Programmable Logic Controller (PLC). The PLC will accumulate data generated by: level sensors, level switches, and run time meter. The PLC will instruct the pump soft start controllers to perform operations according to a custom program.

PLC and other low voltage controls may be mounted in the same enclosure as the motor soft starters or in a separate enclosure, as safety standards and design efficiency permit.

PLC shall be Square D, Omron or Allen-Bradley MicroLogix or equal with Ethernet port and associated I/O hardware.

## **11. Execution – General**

Instrumentation and accessory equipment shall be installed in accordance with specification Section 13300 and as specified herein.

Unless specifically shown otherwise in the Drawings, direct reading or electrical transmitting instrumentation shall not be mounted on process piping. Instrumentation shall be mounted on instrument racks or stands. All instrumentation connections shall be provided with shutoff and drain valves.

All piping to and from field instrumentation shall be provided with necessary unions, test tees, couplings, adapters, and shut-off valves.

Field instruments requiring power supplies shall be provided with local electrical shut-offs and fuses as required.

The shield on each process instrumentation cable shall be continuous from source to destination and be grounded as directed by the manufacturer of the instrumentation equipment, but in no case shall more than one ground point be employed for each shield.

Lifting rings shall be removed from all panels and assemblies once in position. Plugs of the same color as the panel shall then be installed in the holes.

The supplier shall coordinate the installation, placing and location of system components, their connections to the process equipment panels, cabinets and devices, subject to the Engineer's approval.

The supplier shall ensure that all field wiring for power and signal circuits are in accordance with best industry practice, and provide for all necessary system grounding to insure a satisfactory functioning installation.

## Electrical Specification 13330 – Pumps Instrumentation and Controls – PLC Software

### 1. Scope

This section covers the furnishing program logic for the PLC controller located at the inflow pump station.

### 2. Definitions

This section refers to several sensors which are referred to by letter for clarity. The sensors are defined in the table below.

Sensor ID	Sensor Location	Measures	Type
A	PVC Wet Well	Inflow Canal Water Supply Level	Analog
B	Inside Sluice Gate Precast Pump	Stormwater Pond Water Level	Analog
C	Inside Pump 1 Precast Sump	Minimum Water Level Sensor	Float Switch
D	Inside Pump 2 Precast Sump	Minimum Water Level Sensor	Float Switch

The PLC program will have time delays to provide smooth operation and to prevent damage to the motors. A summary of the delays are provided in the table below.

Delay ID	PLC Time Range	Beginning Program Time Value	Time Units	Description
1	0-9999	300	Seconds	Sensor A start pump signal – Lead Pump
2	0-9999	300	Seconds	Sensor A start pump signal – Lag Pump
3	0-9999	60	Seconds	Sensor A stop pump signal – Lead Pump
4	0-9999	60	Seconds	Sensor A stop pump signal – Lag Pump
5	0-9999	10	Seconds	Sensor B run enable pumps signal
6	0-9999	120	Seconds	Sensor B stop pumps signal
7	0-9999	10	Seconds	Sensor C stop pump signal
8	0-9999	60	Seconds	Sensor C enable pump restart signal
9	0-9999	10	Seconds	Sensor D stop pump signal
10	0-9999	60	Seconds	Sensor D enable pump restart signal

### 3. Related Work

Refer to ES 13300 and 13315.

### 4. Submittals

Programmer must demonstrate to the Engineer the functionality of the proposed PLC program prior to installing on the PLC units.

### 5. Reference Standards

Refer to ES 13300.

### 6. Quality Assurance

Refer to ES 13300.

## **7. Maintenance and Test Equipment**

Any special equipment and software necessary for the continued operation, monitoring and maintenance of the PLC's and the pump control program will be included as part of this contract with no extra charges incurred to the Owner including PC software and connection cables for standard Windows PC laptop (supplied by Owner.)

## **8. Program Logix – Duplex Pump Control**

The control logic discussion assumes that the PCL logic use standard duplex pump control logic for two pump down (dewatering) pumps. Typical for this type of software are the following functions:

- 1) Pump start alternation
- 2) Pump alternation for run time
- 3) Alternating or parallel pump operation based on level conditions and program settings
- 4) Adjustable time delays to provide smooth operation
- 5) Pump short cycling protection
- 6) Hand-Off-Auto coordination
- 7) Restart options after safety shutdown
- 8) Indicator lights for time delays, safety shutdown and pump operation
- 9) Bypass a pump which has been taken off line by safeties
- 10) Log and display run time hours for each pump
- 11) Log faults and provide fault resolution

Lead pump will be the first to start when the water level reaches the required level, Lag pump will start if water level continues to rise to second start level, typically 6" above lead pump.

## **9. Program Logix – PLC Software Development**

The control equipment designer and programmer of the PLC should coordinate with the Engineer by meeting with him through internet software or in person prior developing the PVC software. The Engineer envisions the PLC software to be a standard duplex pump control product with only minor adjustments to the programming being required to fit the specifics of the proposed pump station.

## **Electrical Specification 16050 – Basic Materials and Methods**

### **1. Scope**

Summary of Work: The Contractor shall furnish all labor, equipment and material for installation of the electrical hardware as described herein and as shown on the Drawings.

The provisions of this Section apply to all electrical specifications, except for those covered by sections ES 13300, ES 13315 and ES 13330.

Concrete, excavation, backfill, and steel reinforcement required for encasement, installation, or construction of the work of the various sections of the electrical specifications is included as a part of the work under the respective sections, including duct banks, manholes, handholes, equipment housekeeping pads, and light pole bases.

The Contractor shall be responsible for identifying available existing circuit breakers in lighting panels for the intended use as required by the Drawings. Contractor shall also be responsible for field verifying the available space in substation switchboards to integrate new power circuit breakers. Costs for this work shall be included in the Contractor's original bid amount.

### **2. Applicable publications**

- 1) NEC (NFPA 70) National Electrical Code 2015 Edition
- 2) NETA International Electrical Testing Association – Acceptance Testing Specifications
- 3) NEMA 250 - Enclosure for Electrical Equipment (1,000 Volts Maximum)
- 4) Local Building Codes and Standards

### **3. Submittals**

The Contractor shall provide the following for shop drawing submittals:

- 5) Complete material lists stating manufacturer and brand name of each item or class of material.
- 6) Shop Drawings for all grounding work not specifically indicated.
- 7) Front, side, rear elevations, and top views with dimensional data.
- 8) Location of conduit entrances and access plates.
- 9) Component data.
- 10) Connection diagrams, terminal numbers, internal wiring diagrams, conductor size, and cable numbers.
- 11) Method of anchoring, seismic requirements, weight.
- 12) Types of materials and finish.
- 13) Nameplates.
- 14) Temperature limitations, as applicable.
- 15) Voltage requirement, phase, and current, as applicable.
- 16) Front and rear access requirements.
- 17) Test reports.



- 18) Grounding requirements.
- 19) Catalog cuts or photocopies of applicable pages of bulletins or brochures for mass produced, non-custom manufactured material. Catalog data sheets shall be stamped to indicate the project name, applicable Section and paragraph, model number, and options. This information shall be marked in spaces designated for such data in the company's stamp.

Shop Drawings shall be custom prepared. Drawings or data indicating "optional" or "as required" equipment are not acceptable. Options not proposed shall be crossed out or deleted from Shop Drawings.

**Materials and equipment schedules:** The Contractor shall deliver to the Engineer within 30 days of the commencement date in the Notice to Proceed, a complete list of all materials, equipment, apparatus, and fixtures proposed for use. The list shall include type, sizes, names of manufacturers, catalog numbers, and such other information required to identify the items.

**Record drawings:** The Contractor shall show invert and top elevations and routing of all duct banks and concealed below-grade electrical installations. Buried electrical conduits shall be located by showing the horizontal distance to two fixed structures at the start of the conduit installation, the end of the conduit installation, and for every conduit change of direction. In addition, circuit schematic drawings and wiring drawings shall show all field changes. Layout drawings shall show all equipment location changes. Record drawings shall be prepared and be available to the Engineer.

Where test reports are indicated, proof of design test reports for mass-produced equipment shall be submitted with the Shop Drawings, and factory performance test reports for custom-manufactured equipment shall be submitted and be approved prior to shipment. Field test reports shall be submitted for review prior to Substantial Completion.

#### **4. Responsibilities**

The Contractor shall contact the serving utility and verify compliance with requirements before construction. The Contractor shall coordinate schedules and payments for work by all utilities.

Electrical service shall be as indicated and be as required by the serving utility.

The Contractor shall verify and provide all service conduits, fittings, transformer pad, grounding devices, and all service wires not provided by the serving utility. The Contractor shall verify with the utility the exact location of each service point and type of service, and shall pay all charges levied by the serving utilities as part of the work.

Permits shall be obtained and inspection fees shall be paid according to the terms of the contract between the Owner and the Contractor.

The Contractor shall pay all connection and turn-on service charges required by the utility company.

The Contractor shall be responsible for factory and field tests required by the electrical specifications, by the Engineer and other authorities having jurisdiction. The Contractor shall furnish necessary testing equipment and pay costs of tests, including all replacement parts and labor, due to damage resulting from damaged equipment or from testing and correction of faulty installation.

#### **5. Inspection coordination**

The Contractor shall provide access to the work for the Engineer as requested for inspection. The Contractor shall provide 48 hours notice of its intention to begin new work activities.

## 6. Products

### 1) General:

- A. The Contractor shall provide equipment and materials that shall be new, shall be listed by UL, or by an independent testing laboratory acceptable to the local code enforcement agency having jurisdiction, and shall bear the UL label or other certification where these requirements apply. Equipment and materials shall be the products of experienced and reputable manufacturers in the industry. Similar items in the work shall be products of the same manufacturer. Equipment and materials shall be of heavy duty industrial grade.
- B. Where the requirements of the specifications conflict with UL, NEMA, NFPA, or other applicable standards, the more stringent requirements shall govern.
- C. On devices indicated to display dates, the year shall be displayed as 4 digits.

### 2) Signage:

#### A. Electrical Equipment

- 1. Each piece of electrical equipment shall be legibly marked to indicate its purpose unless the purpose is indicated by the location and arrangement.

#### B. Warning Signs

- 1. 115 to 600 Volts nominal, or less. – Entrances to rooms and other guarded locations or enclosures that contain live parts shall be marked with conspicuous signs prohibiting unqualified persons to enter.
- 2. All buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at 600 volts nominal, or less, shall be lockable. Permanent and conspicuous warning signs shall be provided reading as follows: DANGER – HIGH VOLTAGE – KEEP OUT.
- 3. Outside branch circuits and feeders – for 600 volts nominal, or more – Warning signs shall be posted in plain view where unauthorized persons might come in contact with live parts – "WARNING – HIGH VOLTAGE – KEEP OUT"

- C. Isolating Switches – Isolating switches not interlocked with an approved circuit interrupting device shall be provided with a sign warning against opening them under load.

## 7. Area designations

### 1) General:

- A. Raceway system enclosures shall comply as mentioned herein.
- B. Electric work specifically indicated in sections within any of the Specifications shall comply with those requirements.

AREA	NEMA ENCLOSURE CLASSIFICATION						
	1	3R	4X	7	9	12	Notes
Air Condition Space	√						
Non A/C Space Interior		√	√			√	Or as directed by project drawings
Outdoor Application		√	√				Or as directed by project drawings

2) Materials Requirements

- A. NEMA 4X enclosures shall be 316 stainless steel.
- B. NEMA 7 enclosures shall be cast aluminum where used with aluminum conduit; cast iron when used with galvanized steel conduit.
- C. NEMA 1, 3R, and 12 enclosures shall be steel coated with ANSI 61 grey paint. NEMA 4X, 7, and 9 shall not be coated.

**8. Mounting hardware**

1) Miscellaneous Hardware

- A. Threaded rods for trapeze supports shall be continuous threaded, 3/8-inch diameter minimum. Utilize hot dipped galvanized steel for dry indoor non process areas and 316 stainless steel for “wet,” “damp,” or “corrosive” areas.
- B. Strut for mounting of conduits and equipment shall be 316 stainless steel or hot dipped galvanized as specified on project drawings. Where contact with concrete or dissimilar metals may cause galvanic corrosion, suitable non-metallic insulators shall be utilized to prevent such corrosion.
- C. Wall-mounted panels that weigh more than 500 pounds shall be provided and mounted with steel support pedestals. Transformers hung from 4-inch stud walls and weighing more than 300 pounds shall have auxiliary floor supports.

2) Bolts and Anchors

- A. Standard Service (Non-Corrosive Application): Unless otherwise indicated, bolts, anchor bolts, washers, and nuts shall be steel as indicated herein. Threads on galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing. Except as otherwise indicated, steel for bolt material, anchor bolts and cap screws shall be in accordance with the following
  - 1. Structural connections: ASTM A 307, Grade A or B, hot-dip galvanized
  - 2. Anchor Bolts: ASTM A 307, Grade A or B, or ASTM A 36, hot-dip galvanized
  - 3. High strength bolts where indicated: ASTM A 325

- B. Corrosive Service: All bolts, nuts, and washers in the locations listed below shall be stainless steel as indicated below.
  - 1. All buried locations.
  - 2. All submerged locations.
  - 3. All locations subject to seasonal or occasional flooding.
  - 4. Inside hydraulic structures below the top of the structure.
  - 5. Inside buried vaults, manholes, and structures which do not drain through a gravity sewer or to a sump with a pump.
  - 6. All chemical handling areas.
  - 7. Inside trenches, containment walls, and curbed areas.
  - 8. Locations indicated by the Contract Documents or designated by the Engineer to be provided with stainless steel bolts.
- C. Unless otherwise indicated, stainless steel bolts, anchor bolts, nuts, and washers shall be Type 316 stainless steel, class 2, conforming to ASTM A 193 for bolts and to ASTM A 194 for nuts. All threads on stainless steel bolts shall be protected with an antiseize lubricant suitable for submerged stainless steel bolts, to meet government specification MIL-A-907E. Buried bolts in poorly drained soil shall be coated the same as the buried pipe.
  - a. Anti-seizure lubricant shall be classified as acceptable for potable water use by the NSF.
  - b. Anti-seizure lubricant shall be odorless, non-toxic, weather-proof, teflon based, with operating temperatures up to 475 deg F.
- D. Indoors Finished Areas Service:
  - a. Expanding-Type Anchors: Expanding-type anchors if indicated or permitted, shall be 18-8 stainless steel split expansion ring with threaded stud bolt body and integral cone expander, nut and washer. Plated carbon steel, hot-dipped galvanized carbon steel, type 304 stainless steel or type 316 stainless steel anchor bodies, as identified in the drawings or other notations.

## 9. Electrical identification

Nameplates: Nameplates shall be fabricated from white-letter, black-face laminated plastic engraving stock. Each shall be fastened securely, using fasteners of brass, cadmium plated steel, or stainless steel, screwed into inserts or tapped holes, as required. Engraved characters shall be block style with no characters smaller than 1/4-inch high.

Conductor and Equipment Identification: Conductor and equipment identification devices shall be either imprinted plastic-coated cloth marking devices or shall be heat-shrink plastic tubing, imprinted split-sleeve markers cemented in place.

## 10. Execution

### General:

Incidentals: The Contractor shall provide all materials and incidentals required for a complete and operable system, even if not required explicitly by the Specifications or the Drawings. Typical incidentals are terminal lugs not furnished with vendor supplied equipment, compression connectors for cables, splices, junction and terminal boxes, and control wiring required by vendor furnished equipment to connect with other equipment indicated in the Contract Documents.

- 1) Field Control of Location and Arrangement: The Contractor shall determine the exact locations in the field based on the physical size and arrangement of equipment, finished elevations, and other obstructions. The Drawings indicate the desired location and arrangement of outlets, conduit runs, equipment, and other items. Locations on the Drawings, however, shall be followed as closely as possible.
  - A. Where conduit development drawings or "home runs" are shown, the Contractor shall route the conduits in accordance with the indicated installation requirements. Routings shall be exposed or encased as indicated, except that conduit in finished areas shall be concealed unless specifically indicated otherwise. Conduits encased in a slab shall be sized for conduit OD to not exceed one-third of the slab thickness and be laid out and spaced to not impede concrete flow.
  - B. Conduit and equipment shall be installed in such a manner as to avoid all obstructions and to preserve head room and keep openings and passageways clear. Lighting fixtures, switches, convenience outlets, and similar items shall be located within finished rooms as indicated. Where the Drawings do not indicate exact locations, such locations shall be determined by the Engineer. Lighting fixture locations shall be adjusted slightly as necessary prior to installation to avoid obstructions and to minimize shadows.
  - C. Wherever conduits and wiring for lighting and receptacles are not indicated, it shall be the Contractor's responsibility to provide all lighting and receptacle-related conduits and wiring as required, based on the actual installed fixture layout and the circuit designations as indicated. Wiring shall be #12 AWG minimum, and conduits shall be 3/4-inch minimum (exposed) and 1-inch minimum (encased). Where circuits are combined in the same raceway, the Contractor shall derate conductor ampacities in accordance with NEC requirements.
- 3) Workmanship: Materials and equipment shall be installed in strict accordance with printed recommendations of the manufacturer. Installation shall be accomplished by workers skilled in the work. Installation shall be coordinated in the field with other trades to avoid interference.
- 4) Protection of Equipment and Materials: The Contractor shall fully protect materials and equipment against damage from any cause. Materials and equipment, both in storage and during construction, shall be covered in such a manner that no finished surfaces will be damaged, marred, or splattered with water, foam, plaster, or paint. Moving parts shall be kept clean and dry. The Contractor shall replace or refinish damaged materials or equipment, including faceplates of panels and switchboard sections as part of the work.
- 5) Incoming utility power equipment shall be provided in conformance with the utility's requirements.

- 6) Installation of electrical equipment and materials shall comply with OSHA Safety and Health Standards (29 CFR 1910 and 29 FR 1926, as applicable), state building standards, and applicable local codes and regulations.

Core drilling:

- 1) The Contractor shall perform core drilling required for installation of raceways through concrete walls and floors. Locations of floor penetrations, as may be required, shall be based on field conditions. Verify all core drilling locations based on equipment actually furnished as well as exact field placement. To the extent possible, identify the existence and locations of encased raceways and other piping in existing walls and floors with the Engineer prior to any core drilling activities.

Concrete housekeeping pads:

- 1) Concrete housekeeping pads shall be provided for indoor floor standing electrical equipment. Housekeeping pads for equipment, including future units, shall be 4 inches nominal above surrounding finished floor or grade and 4 inches larger in both dimensions than the equipment, unless otherwise indicated.
- 2) Concrete housekeeping curbs shall be provided for all conduit stub-ups in indoor locations that are not concealed by equipment enclosures. Such curbing shall be 4 inches nominal above finished floor or grade.

Equipment identification: Equipment and devices shall be identified as follows:

- 1) Nameplates shall be provided for all panelboards, control and instrumentation panels, starters, switches, and pushbutton stations. In addition to nameplates, control devices shall be equipped with standard collar-type legend plates.
- 2) Control devices within enclosures shall be identified as indicated. Identification shall be similar to the subparagraph above.
- 3) Toggle switches which control loads out of sight of switch and all multi-switch locations of more than 2 switches shall have inscribed finish plates clearly indicating the load.
- 4) Where shown on the drawings, name tags shall be inscribed with the equipment name and tag number.
- 5) The Contractor shall furnish typewritten circuit directories for panelboards; circuit directory shall accurately reflect the devices/equipment connected to each circuit breaker.

Cleaning:

- 1) The Contractor shall thoroughly clean the electrical work before final acceptance. Exposed parts shall be thoroughly clean of cement, plaster, and other materials. Oil and grease spots shall be removed with a non-flammable cleaning solvent. Such surfaces shall be carefully wiped and all cracks and corners scraped out. Touch-up paint shall be applied to scratches on panels and cabinets. Electrical cabinets or enclosures shall be vacuum-cleaned.

## **Electrical Specification 16110 – Raceways, Boxes, Fittings, and Supports**

### **1. Scope**

Furnish and install complete raceway systems as shown on the Drawings and as specified herein.

This specification applies to all electrical work except those covered by sections CS 13300, CS 13315, and CS 13330.

### **2. Applicable publications**

- 1) NEC (NFPA 70) National Electrical Code.
- 2) NETA International Electrical Testing Association - Acceptance Testing Specifications.
- 3) NEMA 250 - Enclosure for Electrical Equipment (1,000 Volts Maximum).
- 4) Local Building Codes and Standards.
- 5) ASTM A47 - Standard Specification for Ferric Malleable Iron Castings
- 6) ASTM 1011 - Standard Specification for Steel. Sheet and Strip, Hot-Rolled, Carbon, Structural, High - Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- 7) ASTM 635 - Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Carbon, Commercial Steel, Drawing Steel, Structural, High - Strength Low Alloy, High - Strength Low Alloy with Improved Formability, Hot-Rolled, General Requirements for D2000 Standard Classification System for Rubber Products in Automotive Applications
- 8) ASTM D 2564-02 - Solvent Cements for Poly Vinyl Chloride Plastic Piping Systems
- 9) UL 508 - Industrial Control Equipment
- 10) UL 514A - Metallic Outlet Boxes
- 11) UL 514B - Fittings for Cable and Conduit
- 12) UL 886 - Standard for Safety for Outlet Boxes and Fittings for use in Hazardous (Classified) Locations
- 13) UL 1059 - Terminal Blocks
- 14) UL 6 - Standard for Safety for Rigid Metal Conduit - Tight
- 15) UL 360 - Standard for Liquid Tight Flexible Steel Conduit
- 16) ANSI C80.1 revision 94 – Standard for Rigid Steel Conduit - Zinc Coated
- 17) UL 5B - Strut-Type Channel Raceways and Fittings

### **3. Shop drawings**

Complete catalog cuts of all raceways, fittings, boxes, supports, and mounting hardware, marked to show proposed materials and finishes.

Complete catalog cuts of all pullboxes, manholes, and handholes, marked where applicable to show proposed materials and finishes

Dimensioned layout drawings of all cable tray routings, including elevations.

Dimensioned layout drawings of all conduit racks and trapeze type hangers including elevations.

#### **4. Responsibilities**

Unless otherwise hereinafter specified, or shown on the Drawings, all boxes shall be metal.

Combination expansion-deflection fittings shall be used where exposed or embedded conduits cross structure expansion joints.

All conduit, fittings and accessories shall be UL listed and labeled.

Furnish sizes of conduit, fittings and accessories as indicated, specified or as required by Electrical Codes and Standards.

#### **5. Inspection coordination**

The Subcontractor shall provide access to the work for the Engineer as requested for inspection.

The Subcontractor shall provide 48 hours notice of its intention to begin new work activities.

#### **6. Materials**

Rigid Galvanized Steel (RGS) Conduit:

- 1) Rigid steel conduit shall be mild steel, hot-dip galvanized inside and out.
- 2) Rigid steel conduit shall be manufactured in accordance with ANSI C80.1 - Rigid Steel Conduit, Zinc Coated, and UL-6.
- 3) Each conduit length shall be threaded on both ends with threads protected.

Rigid Non-Metallic Conduit:

- 1) Rigid non-metallic conduit shall be Schedule 40 PVC, UV resistant.
- 2) Rigid non-metallic conduit shall be manufactured in accordance with NEMA TC-2 - Electrical Plastic Tubing and Conduit, and UL-651 - Standard for Rigid Non-metallic Conduit.

Electrical Metallic Tubing (EMT):

- 1) Electrical metallic tubing shall be hot-dipped galvanized steel. EMT conduit shall only be allowed in office or control room areas which are considered air conditioned interior space.

Liquidtight Flexible Conduit:

- 1) Liquidtight flexible conduit shall be constructed of a flexible galvanized metal core with a sunlight resistant thermoplastic outer jacket. Utilize liquid tight flexible conduit with spiral enclosed copper bonding conductors for conduit sizes 1 1/4 inches and smaller.
- 2) Liquidtight flexible conduit shall be manufactured in accordance with UL-360 - Steel Conduits, Liquid-Tight Flexible.
- 3) Fittings used with flexible conduit shall be of the screw-in type.

Flexible Couplings:

- 1) Flexible couplings shall be of heavy-duty construction, water tight, and have electrical conductivity equal to rigid conduit. 3/4" - 2" shall have an inner brass core with insulating liner, outer bronze braid. 2 1/2"-4" shall have inner stainless steel core with insulating liner, outer stainless steel braid. Couplings shall be in compliance with UL Standard 886 and conform to ASTM A47-77, Grade 32510.



#### Boxes and Fittings:

- 1) Terminal boxes, junction boxes, pull boxes, etc. shall be sheet steel unless otherwise shown on the Drawings. Boxes shall be galvanized and have continuously welded seams. Welds shall be ground smooth and galvanized. Box bodies shall be flanged and shall not have holes or knockouts. Box bodies shall not be less than 14-gauge metal and covers shall not be less than 12-gauge metal. Covers shall be gasketed and fastened with stainless steel screws.
- 2) Cast iron boxes and fittings shall be galvanized with cast galvanized covers and corrosion proof screws. Cast and malleable iron fittings for use with metallic conduit shall be the threaded type with five full threads
- 3) In outdoor areas, conduit shall be terminated in raintight hubs. In other than outdoor areas, sealed locknuts and bushings shall be used.
- 4) Conduit, fittings, and boxes in hazardous locations shall be suitable for the Class and Division indicated.
- 5) Floor boxes shall be of the round or rectangular cast metal type. Boxes shall be watertight and cover frames shall be adjustable. Box covers shall finish flush with finished floor surface. Boxes shall be located as directed by the District and/or as indicated on the Drawings. Necessary gaskets, sealing compound, plugs, or devices shall be provided for the complete installation.
- 6) Steel elbows and couplings shall be hot-dipped galvanized. Joints shall be taped.
- 7) Electrical metallic tubing fittings shall be of the rain-tight, concrete-tight, compression type.

#### Outlet Boxes:

- 1) Construction: Outlet boxes shall be Zinc-coated or cadmium-plated sheet steel boxes of a class to satisfy the condition at each outlet except where unilet or conduit bodies are required. They shall be knockout type with knockouts removed only where necessary to accommodate the conduit entering. Square cornered, straight-sided gang boxes, 4-inch octagon concrete rings and 4 inch octagon hung ceiling boxes with bars, may be folded type. All other boxes shall be one-piece, deep-drawn.
- 2) Size: All boxes shall be of sufficient size to accommodate the required number and sizes of conduits, wires and splices in accordance with NEC requirements, but not smaller than size shown or specified. Special purpose boxes shall be sized for the device or application indicated.
- 3) Fixture Studs: 3/8 inch malleable-iron fixture studs shall be used in outlet boxes for ceiling lighting fixtures and interior-bracket lighting fixtures, other than lamp receptacles and drop cords.
- 4) Exposed: Screw-joint type boxes, with gasketed weatherproof covers shall be used in locations exposed to the weather.
- 5) Tile Boxes: Boxes rectangular in shape with square corners and straight sides shall be used for receptacles and switches mounted in furniture cabinets or in glazed tile, concrete block, marble, brick, stone or wood walls. Install without plaster rings.
- 6) Wall-mounted Switch, Receptacle, and Signal Boxes: Shall be, unless otherwise noted or specified, not less than 4 inches square by 2 inches deep for two devices, and multigang

boxes for more than two devices. Boxes for switches and receptacles on unfinished walls may be screw-joint type with covers to fit the devices.

- 7) Wall-mounted Telephone Outlet Boxes: Shall be 4 inches square by 2 inches deep, unless otherwise noted on the Drawings.
- 8) Light Fixture Boxes: Shall be 4 inch diameter by 2 inch deep, minimum, for ceiling and interior bracket fixtures with concealed conduits. Plaster covers for bracket fixtures shall have 3-inch diameter openings. Screw-joint boxes with canopy seat shall be used for ceiling and interior bracket fixtures with exposed conduits.
- 9) Grounding Terminal: Provide a grounding terminal in each box containing a green equipment ground conductor, or serving motors, lighting fixtures, or receptacles. Grounding terminal shall be green-colored, washer-inhead, machine screw or grounding bushing.

#### Pullboxes:

- 1) Pullboxes shall be minimum NEC size requirements unless larger box is noted, as specified for outlet boxes with blank cover for pullboxes with internal volume not more than 150 cubic inches, and as specified for cabinets for pullboxes with internal volume over 150 cubic inches, except covers to have some thickness as box with corrosion resistant screw or bolt attachment.

#### PVC Fittings:

- 1) Fittings for use with rigid non-metallic conduit shall be PVC, solvent welded type.
- 2) Provide watertight field-applied coat of all weather PVC solvent cement compound with viscosity and wet film thickness recommended as required for installation of non-metallic conduit and fittings. The cement compound shall be furnished by the conduit manufacturer. PVC solvent cement shall meet the requirements of ASTM D 2564-02, "Solvent Cements for Poly Vinyl Chloride Plastic Piping Systems".

#### Stainless Steel Boxes:

- 1) Stainless steel boxes shall be used with RGS conduit and where indicated.
- 2) Stainless steel boxes shall be NEMA 4X, Type 316 as indicated in specification SECTION 16050.
- 3) Stainless steel shall be minimum 14-gauge thickness, with a brushed finish.
- 4) Doors shall have full length stainless steel piano hinges. Non-hinged boxes are not acceptable.

#### Terminal Cabinets:

- 1) Interiors shall be so designed that control relays and terminal blocks can be replaced or added without disturbing adjacent units. Each cabinet shall be furnished with a minimum of 30% spare terminals.
- 2) All interiors shall be completely factory assembled with control relays, terminal blocks, insulating barriers, etc. All 120 volt AC and DC terminal blocks shall be isolated from each other by insulating barriers or separate enclosures.

- 3) All wiring within the cabinets shall be grouped together in harnesses and secured to the structure.
- 4) For terminal block specification refer to ES 16120.
- 5) Boxes shall be made from 14 gauge galvanized steel and shall be of sufficient size to provide a minimum of 4 inches of wiring space on all sides and between adjacent terminal blocks. A minimum two-inch spare shall be provided between control relays. A minimum of four mounting studs shall be provided on each cabinet. Cabinets shall be furnished without knockouts. Holes for raceways shall be drilled on the job.
- 6) A single hinged door shall cover the front of each terminal cabinet. Doors shall have a neoprene gasket, vault type handle, three-point catch and lock. Two keys will be supplied for each lock. All locks shall be keyed alike.
- 7) All exterior and interior steel surfaces of the cabinets shall be properly cleaned and finished with gray over a rust-inhibiting phosphatized coating conforming to ANSI A55.1. The finish paint shall be of a type to which field applied paint will adhere.
- 8) Cabinets shall be painted 14 gauge or 16 gauge steel with 14 gauge steel doors, seams continuously welded and ground smooth, no holes or knockouts, with latch kit hardware. Cabinets shall conform to UL 508, File No. E61997, Type 12 and Type 13, NEMA/EEMAC Type 12 and Type 13.

#### Conduit Mounting Hardware:

- 1) Conduit supports shall be one hole galvanized malleable iron pipe straps with galvanized clamp backs and nesting backs where required.
- 2) Ceiling hangers shall be adjustable galvanized carbon steel pipe hangers. Straps or hangers of plumbers perforated tape shall not be acceptable. Hanger rods shall be 3/8 inch minimum galvanized all-thread rod and shall meet or exceed ASTM A193B7. Trapeze, rod type hangers shall not be loaded in excess of 500 pounds per rod. Where loading exceeds this value, rigid frames shall be provided.
- 3) Racks shall be constructed from framing channel. Channels and all associated hardware shall be steel, hot dipped galvanized after fabrication of the channel. Field cuts shall be painted with zinc rich paint. Channels attached directly to building surfaces shall be 14-gauge minimum material 1 5/8 inch wide by 13/16 inch depth. All other channels shall be 12-gauge minimum 1 5/8 inch wide by 1 5/8 inch minimum depth. Racks shall be designed to limit deflection to 1/200 of span length. All exposed ends of framing channel shall be covered with manufacturer's standard plastic inserts.

#### **7. Cable trays**

Cable tray systems shall be composed of straight sections, curved sections, fittings, and accessories as defined in the latest NEMA Standards publication VE-1 - Ventilated Cable Tray.

- 1) The cable tray and fittings shall be hot-dip galvanized after fabrication, aluminum or stainless steel.
- 2) Cable tray shall be ladder type with 6, 9, 12, or 24-inch spacing with ventilated trough or solid trough. Tray sizes shall have 3, 4, 5 or 6-inch minimum usable load depth as indicated on project drawings.

- 3) Loading capacities shall meet NEMA weight classification with a safety factor of 1.5.

## **8. Manholes and handholes**

Manholes and pullboxes shall be precast, light duty, heavy duty or extra heavy duty of square, rectangular, or round configurations with loading capacities as shown on the drawings.

- 1) Traffic covers shall be traffic type, H-20 loading, except as indicated otherwise. Manhole and pullbox covers shall be identified as "Electric" by raised letters cast into the covers. Manhole frames and covers shall be heavy duty, frost-tight, water-tight neoprene gasketed frame, solid lids and inner lids.
- 2) Manholes shall have frost-proof and water-tight grey iron frames and covers with solid lids and inner lids with 28-inch clear openings. Covers and lids shall be bolted to cast-in-place steel frames with corrosion resistant hardware. Covers shall be cast-iron and shall have pick-holes.

Manholes and pullboxes shall be equipped with pulling-in irons opposite and below each ductway entrance.

PVC ductbank conduits shall be provided with end bells. Brackets and 60-inch concrete inserts shall be provided in manholes as required for racking wiring through manholes.

## **9. Duct banks**

Underground ducts shall be Schedule 40 PVC, unless otherwise noted.

Ducts shall be arranged as shown on the drawings and encased in concrete. Variations from the standard duct bank configurations will be considered by the Engineer on a case by case basis if needed to clear obstacles or provide adequate cover. Concrete shall have 3,000 psi compressive strength conforming to CS 031/34M.

Ductbanks shall contain a No. 4/0 bare stranded copper ground wire. The ground wire shall be continuous through the ductbank and terminate at power distribution equipment and grounding grid.

Identification Tape: Continuous lengths of underground warning tapes shall be installed 12-inches above and parallel to all ductbanks. Tape shall be 6-inches wide polyethylene with foil backing film imprinted "CAUTION - ELECTRIC UTILITIES BELOW."

## **10. Preparation**

The Subcontractor shall provide suitable protection for conduit risers against damage during construction.

The Subcontractor shall cap ends of all conduits before concrete is poured.

The Subcontractor shall install pull cord and cap all conduits after cleaning where conduits are to be left empty by this Contract.

The Subcontractor shall carefully ream ends of all conduit lengths after cutting to eliminate sharp burrs.

The Subcontractor shall clean out all conduits before pulling wire.

The Subcontractor shall clean out all conduits immediately after concrete work is finished.

## 11. Installation

- 1) No conduit smaller than 3/4-inch electrical trade size shall be used, nor shall any have more than three 90° bends in any one run. Pull boxes shall be provided as required per references listed in section 1.02.
- 2) No wire shall be pulled until the conduit system is complete in all details; in the case of concealed work, until all rough plastering or masonry has been completed; in the case of exposed work, until the conduit system has been completed in every detail.
- 3) The ends of all conduits shall be tightly plugged to exclude dust and moisture while under construction.
- 4) Conduit supports shall be spaced at intervals of 8 feet or less, as required to obtain rigid construction.
- 5) Single conduits shall be supported by means of one-hole pipe clamps in combination with one-screw back plates, to raise conduits from the surface. Multiple runs of conduits shall be supported on trapeze type hangers with steel horizontal members and threaded hanger rods. The rods shall be not less than 3/8-inch diameter.
- 6) Conduit hangers shall be attached to structural steel by means of beam or channel clamps. Where attached to concrete surfaces, concrete inserts of the spot type shall be provided.
- 7) All conduits on exposed work shall be run at right angles to and parallel with the surrounding wall and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduits shall be run perfectly straight and true.
- 8) No unbroken run shall exceed 300 feet in length. This length shall be reduced by 75-feet for each 90° elbow.
- 9) Conduits terminating in pressed steel boxes shall have double lock nuts and insulated bushings.
- 10) Conduits terminating in gasketed enclosures shall be terminated with conduit hubs.
- 11) Conduit wall seals shall be used for all conduits penetrating walls below grade or other locations shown on the Drawings.
- 12) Liquid-tight, flexible metal conduit shall be used for all motor terminations and other equipment where vibration is present.
- 13) Conduit stubouts for future construction shall be provided with threaded PVC end caps at each end.
- 14) All wiring shall be run in raceway unless indicated otherwise.
- 15) Raceways shall be installed between equipment as indicated. Raceway systems shall be electrically and mechanically complete before conductors are installed. Bends and offsets shall be smooth and symmetrical, and shall be accomplished with tools designed for this purpose. Factory elbows shall be utilized wherever possible.
- 16) Where raceway routings are indicated on plan views, follow those routings to the extent possible.

- 17) Where raceways are indicated but routing is not shown, such as home runs or on conduit developments and schedules, raceway routings shall be the Subcontractor's choice and in strict accordance with the NEC and customary installation practice. Raceway shall be encased, exposed, concealed, or under floor as indicated, except that conduit in finished areas shall be concealed unless specifically indicated otherwise.
- 18) Underground raceways shall be installed between manholes, handholes, and pullboxes as indicated. Raceway systems shall be electrically and mechanically complete before conductors are installed. Bends and offsets shall be smooth and symmetrical, and shall be fabricated with tools designed for this purpose. Factory elbows shall be utilized wherever possible. Continuous lengths of underground warning tapes shall be installed 12-inches above and parallel to all underground conduits. Tape shall be 6-inches wide polyethylene with foil backing film imprinted "CAUTION – ELECTRIC UTILITIES BELOW."
- 19) Routing shall be adjusted to avoid obstruction. Coordinate between trades prior to installation of raceways. Lack of such coordination shall not be justification for extra compensation, and removal and re-installation to resolve conflicts shall be by the Subcontractor as part of the work
- 20) Exposed raceways shall be installed parallel or perpendicular to structural beams.
- 21) Install expansion fittings with bonding jumpers wherever raceways cross building expansion joints.
- 22) Wherever contact with concrete or dissimilar metals can produce galvanic corrosion of equipment, suitable insulating means shall be provided to prevent such corrosion.
- 23) Holes:
  - A. The Subcontractor shall provide the required insert materials and holes for all openings in new work completely bonded, curbed, flashed and finished off in an approved manner, whether in concrete, steel grating, metal panels or roofs. Resulting seal shall prevent smoke and gas penetration and adhere to Lloyds Register Standards Certificate Numbers SVG/F93/468, SVG/F93/469 and SVG/F93/470 and applicable UL Standards. Insert materials shall be of one of the following type:
    1. Non-shrinking grout applied to continuously fill annular space between pipe and wall opening. The resulting seal shall serve as an isolator of fire, weather and gaseous conditions.
    2. Fire rated, Ozone and Ultra-Violet radiation resistant, two-part silicone room temperature vulcanizing (RTV) foam.
  - B. The Subcontractor shall core-drill all holes required in existing building work using a dustless method.
- 24) The Subcontractor shall place grout or foam as specified, in the following locations:
  1. All holes in concrete wall, floor and roof slabs after installation of conduit.
  2. Wall entrances where conduit enters the building or vaults from exterior underground.

- 25) The Subcontractor shall install fire and smoke stop fittings at all conduit penetration of fire rated walls, ceilings and floors.

## **11. Conduit**

Exposed conduit shall be Rigid Schedule 40 PVC, unless indicated otherwise:

- 1) In areas with chlorine or acid, schedule 40 PVC shall be utilized.
- 2) In lime or ferric chloride areas, rigid aluminum conduit shall be utilized
- 3) In Class I, Div. I or Div. II hazardous locations, rigid aluminum conduit shall be utilized.

Where conduit emerges from concrete encasement, a PVC Schedule 40 elbow shall be utilized for transition from the concrete (utilize PVC Coated, RGS elbow for analog control conduits). Conduit shall emerge from the concrete perpendicular to the surface whenever possible.

Concrete cover for conduit and fittings shall not be less than 1-1/2 inches for concrete exposed to earth or weather, or less than 3/4-inch for concrete not exposed to weather or in contact with the ground.

Conduits passing through a slab, wall, or beam shall not impair significantly the strength of the construction.

Conduits embedded within a slab, wall, or beam (other than those merely passing through) shall satisfy the following:

- 1) Conduits with their fittings embedded within a column shall not displace more than 4 percent of the gross area of cross section.
- 2) Conduits shall not be larger in outside dimension than one third the overall thickness of slab, wall, or beam in which embedded.
- 3) Conduits shall not be spaced closer than 3 outside diameters on centers

Conduit shall be placed so that cutting, bending, or displacing reinforcement from its proper location will not be required.

Threads shall be coated with a conductive lubricant before assembly.

Joints shall be tight, thoroughly grounded, secure, and free of obstructions in the pipe. Conduit shall be adequately reamed to prevent damage to wires and cables during installation. Strap wrenches and vises shall be used to install conduit to prevent wrench marks on conduit. Conduit with wrench marks shall be replaced.

Wherever possible, conduit runs shall slope to drain at one or both ends of run. Wherever conduit enters substructures below grade, the conduit shall be sloped to drain water away from the structure.

Installation of rigid steel conduit through a core-drilled hole in an exterior wall below grade shall utilize a modular sealing device.

Each conduit shall be identified at each end with a permanent non-corrosive metal marker. Designation shall be pressure stamped into the tag. The conduit identification shall be designated circuit number as shown.

## **12. Supports**

The Subcontractor shall construct metal framing strut systems with sufficient rigidity to hold all mounted equipment and material in permanent and neat alignment. All channels, fittings and

hardware of the strut assemblies shall be as per contract drawings and specifications and shall not exceed load requirements in UL classification 5B, NEC Article 352 and applicable NEMA and ASTM standards. Utilize galvanized material for interior non-corrosive and air conditioned spaces and stainless steel or aluminum, for outdoor or corrosive environments.

Design supports to provide 1/4-inch space between equipment housings and walls or columns upon which they are mounted.

After Power Tool Cleaning, paint all welds, field cuts and damaged areas with one manufacturer type of primer and paint. Utilize organic zinc-rich primer at 3 mils dry film thickness.

All screws, nuts, bolts, pipe clamps and other anchoring materials for struts and framing shall be stainless steel.

All outdoor supports shall be constructed to meet wind load requirements of the site as set forth in structural specifications or/and contract drawings.

### **13. Outlet boxes**

Installation: Unless otherwise specified or shown on the drawings, outlet boxes shall be flush mounted, and the front edges of the boxes or plaster covers shall be flush with the finished wall or ceiling line; or, if installed in walls and ceilings of incombustible construction, not more than 1/4 inch back of same. Mount boxes with the long axes of devices vertical, unless otherwise specified. A multiple of box extensions and/or covers will not be permitted. Install in a rigid and satisfactory manner with suitable metal bar hangers, box cleats, adjustable box hangers, etc. Use wood screws on wood, expansion shields on masonry and machine screws on steelwork.

Mounting Heights: The mounting height of a wall-mounted outlet box shall be construed to mean the height from the finished floor to the horizontal center line of the cover plate. On exposed tile, block, or brick constructions, mount outlet boxes at the nearest bed joint to the mounting height indicated. Verify heights with the Engineer.

Wall-mounted Switch, Receptacle and Signal Outlets: On columns, pilasters, etc., mount so the centers of the columns are clear for future installation of partitions. Install outlet boxes near doors or windows close to the trim. Install according to architectural drawings, unless other locations are approved by the Engineer.

Back-to-back: Outlets shown on the drawings "back-to-back" are to be installed with a minimum of 6 inches lateral separation between outlets. "Through-the-wall" type boxes are not permitted.

### **14. Fixture connections**

Recessed or surface light fixtures in lay-in or accessible ceilings shall be connected with minimum 1/2 inch flexible metallic conduit, 4 to 6 feet long, with grounding provisions.

### **15. Ductbanks**

Ductbanks shall be installed in accordance with the criteria below:

- 1) Duct shall be assembled using high impact non-metallic spacers and saddles to provide conduits with vertical and horizontal separation. Plastic spacers shall be set every 5-feet. The duct array shall be anchored every 5-feet to prevent movement during placement of concrete.
- 2) The duct shall be laid on a grade line of at least 3-inches per 100-feet, sloping towards pullboxes or manholes. Duct shall be installed and pullbox and manhole depths adjusted so



that the top of the concrete envelope is a minimum of 18-inches below grade and a minimum of 24-inches below roadways.

- 3) Changes in direction of the duct envelope by more than 10° horizontally or vertically shall be accomplished using bends with a minimum radius 24 times the duct diameter.
- 4) Duct couplings shall be staggered a minimum of 6-inches.
- 5) The bottom of trench shall be of select backfill or sand.

Each bore of the completed ductbank shall be cleaned by drawing through it a standard flexible mandrel one foot long and 1/4-inch smaller than the nominal size of the duct. After passing of the mandrel, a wire brush and swab shall be drawn through. Spare raceways that are not indicated to contain conductors shall have a 1/8-inch polypropylene pull cord installed throughout the entire length of the raceway.

Duct entrances shall be grouted smooth; ducts shall be terminated with flush end bells. Sections of pre-fabricated manholes and pullboxes shall be assembled with waterproof mastic and shall be set on a 12-inch bed of gravel as recommended by the manufacturer or as required by field conditions.

Ductbank penetration through walls of manholes, pullboxes, and building walls below grade shall be watertight.

Concrete encased ductbank shall terminate at building foundations. When duct enters the building with a concrete slab on grade foundation, duct shall not be encased, but shall transition to rigid steel conduits at the edge of the slab.

#### **16. Buried conduits, yard areas**

The Subcontractor shall place PVC schedule 40 conduit where indicated on project drawings.

Make all joints watertight per requirements of section 2.01.J.2.

Bury conduits a minimum of 24 inches below finish grade unless indicated otherwise.

Slope conduit away from conduit risers where possible.

Maintain 6-inch separation from underground piping.

Use long radius bends at all risers unless indicated otherwise.

After trench bottom has been excavated to elevation, lay conduit. Backfilling shall be as specified in CS 023.

Provide watertight seal around wires where conduit terminates in pull box.

Empty service entrance conduits shall be PVC Schedule 40, or as otherwise required by serving utility.

## **Electrical Specification 16120 – Wires and Cables**

### **1. Scope**

This section includes furnishing and installing (including terminations) of all electrical wire, cable and accessories except where it conflicts with sections CS 13300 or CS 13315.

### **2. Applicable publications**

- 1) NEC (NFPA 70) National Electrical Code 2002 Edition.
- 2) UL 83 – Thermoplastic Insulated Wires and Cables
- 3) NETA International Electrical Testing Association – 1999 Acceptance Testing Specifications

### **3. Submittals**

The Subcontractor shall submit Shop Drawings in accordance with Subcontractor Submittals.

### **4. Testing**

Cable Assembly and Testing: Cable assembly and testing shall comply with applicable requirements of 1999 NETA ATS Section 7.3.2. Factory test results shall be submitted to Engineer prior to shipment of cable. The following field tests shall be the minimum requirements:

- 1) Power cable rated at 600 VAC shall be tested for insulation resistance between phases and from each phase to a ground using a megohmmeter.
- 2) Field testing shall be done after cables are installed in the raceways.
- 3) Field tests shall be performed by a certified test organization acceptable to the cable manufacturer. Test results shall be submitted to the Engineer for review and acceptance.
- 4) Cables failing the tests shall be replaced with a new cable or be repaired. Repair methods shall be as recommended by the cable manufacturer and shall be performed by persons certified by the industry.

Continuity Test: Control and instrumentation cables shall be tested for continuity, polarity, undesirable ground, and origination. Such tests shall be performed after installation and prior to placing cables in service.

### **5. Inspection coordination**

The Subcontractor shall provide access to the work for the Engineer as requested for inspection. The Subcontractor shall provide 48 hours notice of its intention to begin new work activities.

### **6. Warranty**

Any cable which fails either the megohmmeter or continuity test after installation shall be replaced by the Subcontractor at no cost to the Contractor.

### **7. Materials**

Conductors, include grounding conductors, shall be stranded copper. Aluminum conductor wire and cable will not be permitted. Insulation shall bear UL label, the manufacturer's trademark, and identify the type, voltage, and conductor size. All conductors except flexible cords and cables, fixture wires, and conductors that form an integral part of equipment such as motors and controllers shall conform to the requirements of Article 310 of the National Electric Code, latest edition, for

current carrying capacity. Flexible cords and cables shall conform to Article 400, and fixture wires shall conform to Article 402. Wiring shall have wire markers at each end.

Low voltage wire and cable:

- 1) Power and Lighting Wire
  - A. Wire rated for 600 volts in duct or conduit for all power and lighting circuits shall be Class B Type THHN or THWN, polyvinyl chloride rated at 90°C in dry locations, 75°C in wet locations, meeting the requirements of UL 83.
  - B. Conductors for feeders as defined in Article 100 of the NEC shall be sized to prevent a voltage drop exceeding 3 percent at the farthest outlet of power, heating, and lighting loads, or combinations of such loads, and where the maximum total voltage drop on both feeders and branch circuits to the farthest connected load does not exceed 5 percent.
  - C. Conductors for branch circuits as defined in Article 100 of the NEC, shall be sized to prevent voltage drop exceeding 3 percent at the farthest connected load or combinations of such loads and where the maximum total voltage drop on both feeders and branch circuits to the farthest connected load does not exceed 5 percent.
- 2) Control Wire
  - A. Control wire in duct or conduit shall be the same type as power and lighting wire indicated above.
  - B. Control wiring shall be No.14 AWG.
  - C. Control wires at panels and cabinets shall be machine tool grade type MTW, UL approved, rated for 90 degrees C at dry locations.
- 3) Instrumentation Cable
  - A. Instrumentation cable shall be rated at 600 volts.
  - B. Individual conductors shall be No. 16 AWG stranded, tinned copper. Insulation shall be color coded polyethylene: black-red for two-conductor cable and black-red-white for three-conductor cable.
  - C. Instrumentation cables shall be composed of the individual conductors, an aluminum polyester foil shield, a No. 16 AWG stranded tinned copper drain wire, and a PVC outer jacket with a thickness of 0.048-inches.

Connectors:

- 1) Cable connectors shall be designed and sized for specific cable being connected.
- 2) Solderless, pressure-type connectors shall be constructed of non-corrodible tin-plated copper.
- 3) All connectors shall have a current-carrying capacity equal to or greater than the cable being connected.
- 4) Application tooling for connectors shall contain die or piston stops to prevent over-crimping and cycling or pressure relief to prevent under-crimping. Dies of all application

tooling shall provide dot or wire size coding for quality control verification. All tooling shall be manufactured by the connector manufacturer.

- 5) Compression connectors shall be threaded split bolt type of high strength copper alloy. Pressure type, twist-on connectors will not be acceptable.
  - A. Pre-insulated fork tongue lugs shall be nylon terminals with vinyl insulation. Insulators shall have funnel entry.
  - B. General purpose insulating tape shall be high temperature (105°C) tape, with a dielectric strength of 1,150 V/mil of polyvinyl material.
- 6) Power Connectors (10 AWG and Smaller) 600V and Below:
  - A. Power connectors shall be spring wire type.
- 7) Power Connectors (Sizes 8-4 AWG) 600V and Below:
  - A. Non-insulated ring-tongue type.
  - B. Ring tongue sized to match terminal stud size.
  - C. Brazed barrel seam.
  - D. Application tooling designed to crimp the wire barrel (conductor grip) with a one-step crimp.
- 8) Control, Instrument and Specialty Cable Connectors:
  - A. Tin-plated copper.
  - B. Vinyl or nylon pre-insulated ring-tongue type. (Spade lugs will not be permitted).
  - C. Sized to match terminal study size.
  - D. Have insulation grip sleeve to firmly hold to cable insulation.
  - E. Insulation grip sleeve shall be funneled to facilitate wire insertion and prevent turned-back strands.
  - F. Application tooling designed to crimp the wire barrel (conductor grip) and the insulation grip sleeve with a one-step crimp.

Terminal blocks:

- 1) For Mounting in Terminal Boxes:
  - A. Designed and sized for the cables being terminated.
  - B. Phenolic block rated 600 volts.
  - C. Binding screw-type terminals for power cables and straight-strap stud terminals for control and instrument cables.
  - D. Rated current carrying capacity equal to or greater than the cable being terminated.
  - E. Marking strip.
- 2) For Mounting in Cabinets, Panels, Control Boards, Etc.:
  - A. Designed and sized for the cables being terminated.

- B. Terminal blocks shall be tubular screw type with pressure plates and shall be rated 600 V AC/DC, less than 55 A rated minimum.

Cable identification tags: Refer to ES 16050 for appropriate conductor identification material.

## 8. Execution

**General:** The Subcontractor shall provide and terminate all power, control, and instrumentation conductors except where indicated.

**Installation:** Conductors shall not be pulled into raceway until raceway has been cleared of moisture and debris.

Pulling tensions on raceway cables shall be within the limits recommended by the cable manufacturer. Wire pulling lubricant, where needed, shall be UL approved.

Instrumentation wire shall not be run in the same raceway with power and control wiring except where specifically indicated.

Wire in panels, cabinets, and wireways shall be neatly grouped using nylon tie straps, and shall be fanned out to terminals.

Single conductor cable in cable trays shall be No. 1/0 or larger and shall be of a type listed and marked for use in cable trays. Tray cable smaller than 1/0 shall be multi-conductor, with outer jacket.

## 9. Splices and terminations

Wire taps and splices shall be properly taped and insulated according to their respective classes.

In general, there shall be no cable splices in underground manholes or pullboxes. If splices are necessary, the cables shall be brought aboveground and terminated in a NEMA 4X, stainless steel terminal or splice cabinet on a concrete pad. Splices in underground manholes and pullboxes may be made only with the approval of the Engineer.

Stranded conductors shall be terminated directly on equipment box lugs making sure that all conductor strands are confined within lug. Use forked-tongue lugs where equipment box lugs have not been provided.

Excess control and instrumentation wire shall be properly taped and terminated as spares.

- 1) Control Wire and Cable
  - A. Control conductors shall be spliced or terminated only at the locations indicated and only on terminal strips or terminal lugs of vendor furnished equipment.
  - B. In junction boxes, motor control centers, and control panels, control wire and spare wire shall be terminated to terminal strips.
- 2) Instrumentation Wire and Cable
  - A. Shielded instrumentation cables shall be grounded at one end only, preferably the receiving end on a 4-20 mA system.
  - B. Two- and three-conductor shielded cables installed in conduit runs which exceed available standard cable lengths may be spliced in pullboxes. Such cable runs shall have only one splice per conductor.

- 3) Power Wire and Cable
  - A. All 120/208-volt, 120/240-volt, and 480/277-volt branch circuit conductors may be spliced in suitable fittings at locations determined by the Subcontractor.
  - B. Splices to motor leads in motor terminal boxes shall be wrapped with mastic material to form a mold and then shall be taped with a minimum of two layers of varnished cambric tape overtaped with a minimum of two layers of high temperature tape.

## 10. Cable Identification

**General:** Wires and cables shall be identified for proper control of circuits and equipment and to reduce maintenance effort.

**Identification numbers:** The Subcontractor shall assign to each control and instrumentation wire and cable a unique identification number. Numbers shall be assigned to all conductors having common terminals and shall be shown on "as built" drawings. Identification numbers shall appear within 3-inches of conductor terminals. "Control Conductor" shall be defined as any conductor used for alarm, annunciator, or signal purposes.

- 1) Multiconductor cable shall be assigned a number which shall be attached to the cable at intermediate pull boxes and at stub-up locations beneath free-standing equipment. It is expected that the cable number shall form a part of the individual wire number. Individual control conductors and instrumentation cable shall be identified at pull points as described above. The instrumentation cable numbers shall incorporate the loop numbers assigned in the Contract Documents.
- 2) All 120/208-volt system feeder cables and branch circuit conductors shall be color coded as follows: Phase A - black, Phase B - red, Phase C - blue, and Neutral - white. The 120/240-volt system conductors shall be color coded as follows: Line 1 - Black, Line 2 - Red, and Neutral - White. The 480/277-volt system conductors shall be color coded as follows: Phase A - Brown, Phase B - Orange, Phase C - Yellow, and Neutral - Gray. Color coding tape shall be used where colored insulation is not available. Branch circuit switch shall be yellow. Insulated ground wire shall be green, and neutral shall be gray. Color coding and phasing shall be consistent throughout the Site, but bars at panelboards, switchboards, and motor control centers shall be connected Phase A-B-C, top to bottom, or left to right, facing connecting lugs.
- 3) General purpose AC control cables shall be red. General purpose DC control cables shall be blue.
- 4) Spare cable shall be terminated on terminal screws and shall be identified with a unique number as well as with destination.
- 5) Terminal strips shall be identified by computer printable, cloth, self-sticking marker strips attached under the terminal strip.

## **Electrical Specification 16450 – Grounding**

### **1. Scope**

The Subcontractor shall provide the electrical grounding system, complete and operable, in accordance with the Contract Documents. Including but not limited to the building grounding grid, the grounding rod system and ground riser extension to electrical equipment. All grounding components and installation shall meet local building codes.

The requirements of ES 16050 – Basic Materials and Methods apply to this Section.

### **2. Applicable publications**

- 1) NEC Article 250 – Grounding.
- 2) UL 467 - Standard for Safety Grounding and Bonding Equipment.
- 3) IEEE, 837 – 1989 Standard for Qualifying Permanent Connections Used in Substation Grounding.
- 4) IEEE 81-1983 Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
- 5) AWWA C210 – 1997 Standard for Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
- 6) NETA (International Acceptance Testing Specifications)

### **3. Definitions**

Low Voltage Grounded System (600V or less): A low voltage grounded system is a system where the local power supply is a transformer with the transformer secondary grounded.

The first disconnecting means on the load side of this transformer shall provide the point where the neutral conductor is grounded.

The neutral shall be connected to the Equipment Grounding Circuit Conductor only at one point which is within the enclosure of the disconnecting means.

The Grounding Electrode Conductor or the Equipment Grounding Circuit Conductor shall not be used as the neutral.

### **4. Shop drawings**

Manufacturer's product information for connections, clamps, grounding rods and grounding system components, showing compliance with the requirements of this Section must be submitted prior to commencement of work.

### **5. Responsibilities**

The Subcontractor shall not conceal or cover any ground connections until the Engineer or his authorized representative has established that every grounding connection conforms to the Contract Documents and has given the Subcontractor written confirmation.

### **6. Testing**

Measure and test the ground impedance in accordance with IEEE Standard 81 after installation but before connecting the electrode to the remaining grounding system. Verify all ground potentials on plan drawings and submit to the Engineer for final approval.

Test the grounding system per 2017 NETA ATS section 7.13.

## **7. Inspections coordination**

The Subcontractor shall provide access to the work for the Engineer as requested for inspection. The Subcontractor shall provide 48 hours notice of its intention to begin new work activities.

## **8. Products**

Components of the grounding electrode system shall be manufactured in accordance with ANSI/UL 467 - Standard for Safety Grounding and Bonding Equipment, and shall conform to the applicable requirements of National Electrical Code Article 250 and local codes.

Grounding Electrode System:

- 1) Grounding loop conductors shall be bare annealed copper conductors suitable for direct burial. Conductors shall be at least #4/0 unless indicated otherwise.
- 2) Ground Rods
  - A. Unless indicated otherwise, the ground rod shall be a minimum of 3/4-inch in diameter, 20-feet long with pointed end to facilitate driving, and have a uniform covering of electrolytic copper metallurgically bonded to a rigid steel core. The copper to steel bond shall be corrosion resistant. The rod length shall be clearly stamped near the top of the rod.
  - B. Conform to ANSI/UL 467.
  - C. Sectional type joined by threaded copper alloy couplings.
- 3) Buried cable-to-cable and cable-to-ground rod connections shall be made using exothermic welds or compression connectors suitable for direct burial.
- 4) Exposed grounding connectors shall be of the compression type (connector to cable), made of high copper alloy, and be manufactured specifically for the particular grounding application.
- 5) Grounding conductor to grounding rods shall be done by thermal bonding.
- 6) Equipment Grounding Circuit Conductors
  - A. These conductors shall be the same type and insulation as the load circuit conductors. The minimum size shall be as outlined in Table 250.122 of the National Electrical Code, unless indicated otherwise.
  - B. Present in all raceways. The conduit system is not an allowable equipment ground.
  - C. Cable to equipment ground lugs shall be compression type, bolted to the equipment with silicon bronze bolts and lock washers.

Epoxy Coatings:

- 1) All underground grounding connections shall be coated with epoxy paint as specified herein.
- 2) Coating shall be of Polyamide Epoxy with high build corrosion resistance. Resulting coat shall conform to the performance requirements of AWWA C 210.



## **9. Wire, cable, and raceway grounding**

Provide a separate grounding conductor, securely grounded in each raceway independent of raceway material as well as in each raceway with parallel feeder run.

Size as given on the conduit schedule and in accordance with the NEC-Article 250.

Provide the duct bank ground system indicated, including, trenching, splices, ground rods, and connections to equipment and structures.

Grounding Wires and Cables:

- 1) Install using as few joints as possible.
- 2) Protect against abrasion by several wrappings of rubber tape at all points where cable leaves concrete in exposed areas.
- 3) Suitably protect cable against damage during construction.
- 4) Replace or suitably repair cable if damaged by anyone before final acceptance.

## **10. Grounding boxes, motors, and electrical equipment**

Provide a separate grounding conductor for each motor and connect at motor box. Do not use bolts securing motor box to frame or cover for grounding connectors.

Provide a grounding type bushing for secondary feeder conduits which originate from the secondary section of each MCC section, switchboard, or panelboard.

Individually bond these raceways to the ground bus in the secondary section.

Provide a green insulated wire as grounding jumper from the ground screw to a box grounding screw and, for grounding type devices, to equipment grounding conductor.

Interconnect the secondary switchgear neutral bus to the ground bus in the secondary switchgear compartment only at service entrance point or after a transformer.

## **11. Grounding systems**

Embedded Ground Connectors

- 1) The connection shall be made in accordance with the manufacturer's instructions.
- 2) Lay in bottom of trench or in other excavations at least 18 inches below finished grade.
- 3) Maintain clearance of at least 12 inches from all underground metal piping or structures, except where connections thereto are specifically indicated.
- 4) Duct Bank Ground: A grounding conductor shall be embedded in every duct bank as indicated.

Ground Ring

- 1) Furnish trenching and materials necessary to install the ground ring as indicated.
- 2) Bonding conductor shall be in direct contact with the earth and be of the size indicated.
- 3) Minimum burial depth 36-inches or as indicated on the Drawings, whichever is greater.
- 4) Re-compact disturbed soils to original density in 6-inch layers.

## Ground Rods

- 1) Ground rods forming an individual ground array shall be equal in length.
- 2) The Subcontractor shall install rods as indicated by driving and not by drilling or jetting.
- 3) The Subcontractor shall drive rods into unexcavated portion of the earth where possible.
- 4) In excavated areas, the Subcontractor shall drive grounding rods after compaction and backfill is completed.
- 5) The Subcontractor shall drive to a depth such that top of rods will be approximately 18 inches below final grade, or subgrade, and connect main grid ground cable thereto.

## **12. Shield grounding**

Shielded instrumentation cable shall have its shield grounded at one end only unless Shop Drawings indicate the shield will be grounded at both ends.

The grounding point shall be at the control panel or otherwise at the receiving end of the signal carried by the cable.

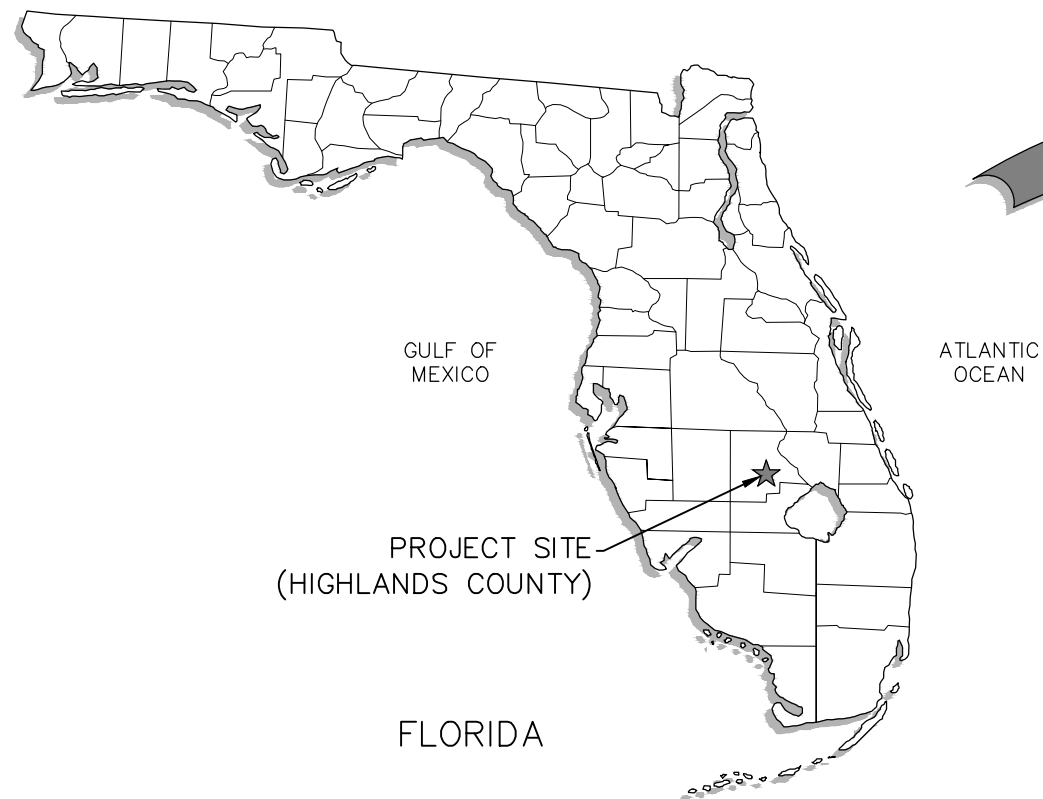
Termination of shield drain wire shall be on its own terminal screw.

All terminal screws shall be jumpered together using manufactured terminal block jumpers.

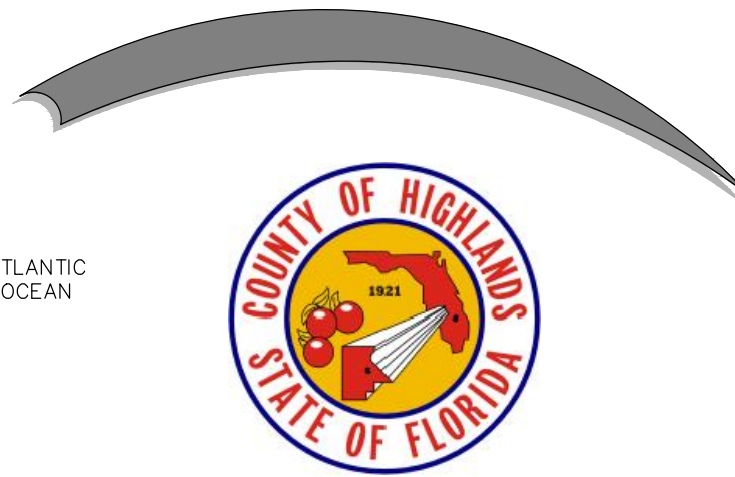
Connection to the ground bus shall be via a green No. 12 conductor to the main ground bus for the panel.

# HIGHLANDS COUNTY BOARD OF COUNTY COMMISSIONERS

## ISTOKPOGA MARSH WATER IMPOUNDMENT DISTRICT IMPOUNDMENT PHASE II



VICINITY MAP  
NTS



MARCH 2018

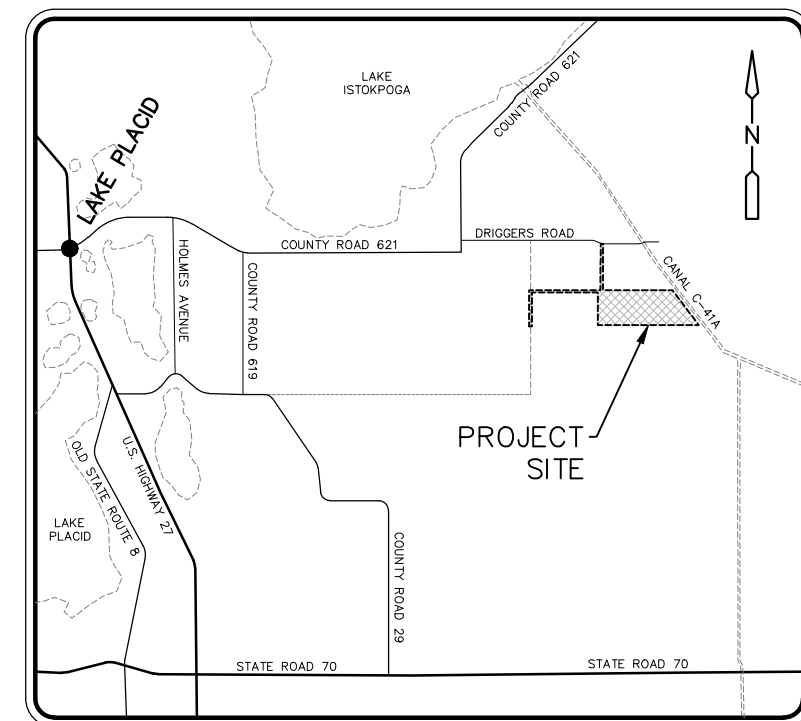
PREPARED BY:

ROYAL CONSULTING SERVICES, INC.

RCS PROJECT NO. 0202-02-ES

Royal Consulting Services, Inc.

211 West Warren Avenue  
Longwood, FL 32750  
(407) 831-3095 phone  
(407) 831-5095 fax  
www.royalconsulting.com  
FL COA No. 7290



LOCATION MAP  
NTS

PROFESSIONAL ENGINEER  
STATE OF FLORIDA

**For Review**

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GENERAL  
CIVIL

Richard A. Jones  
FL P.E. No. 31118





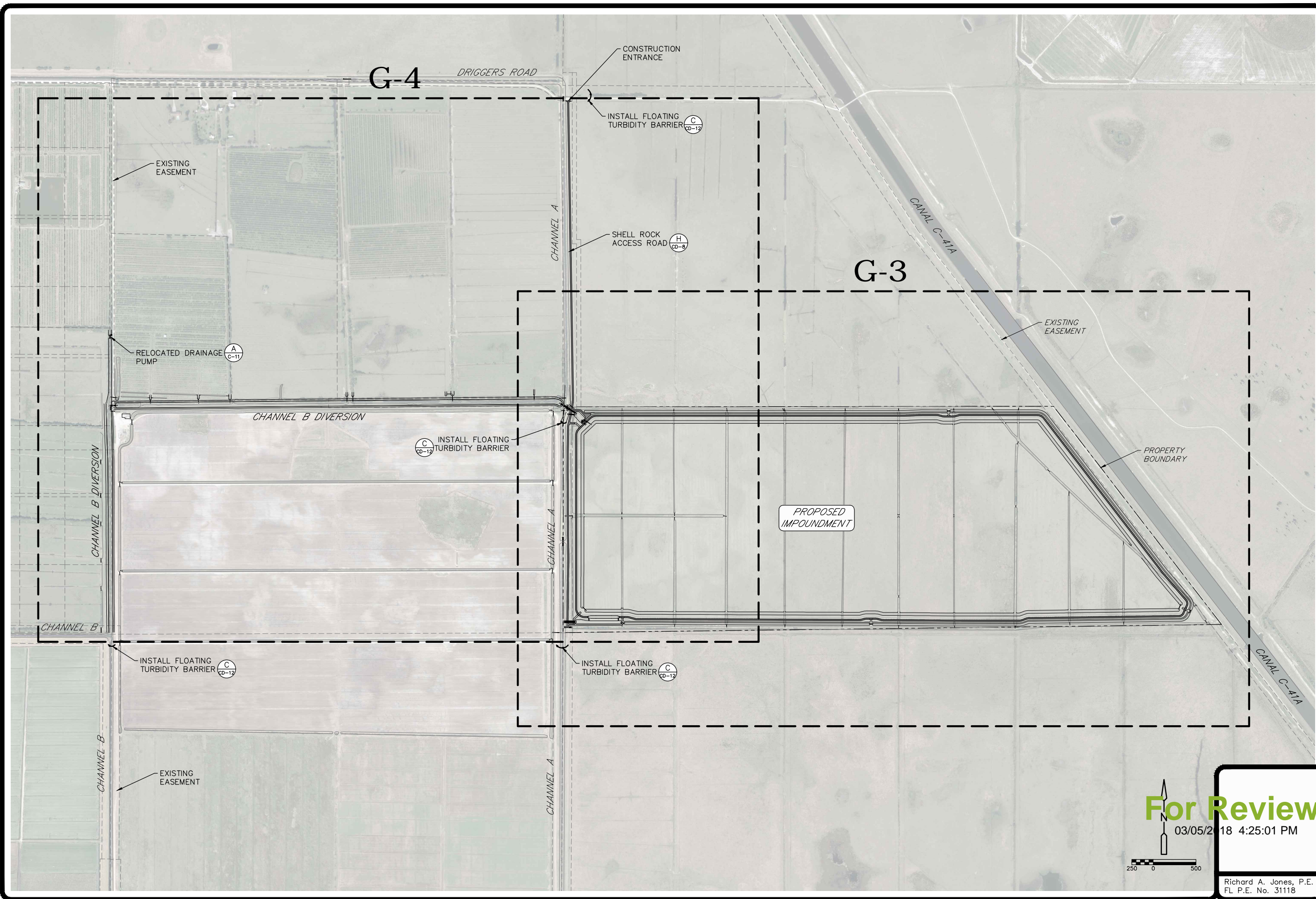
No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

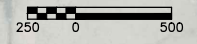
SITE OVERVIEW

Royal Consulting Services, Inc.  
 211 West Warren Avenue  
 Longwood, FL 32750  
 (407) 831-5095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
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SHEET  
 G-2

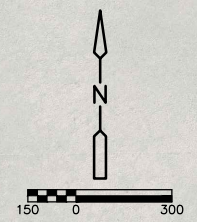
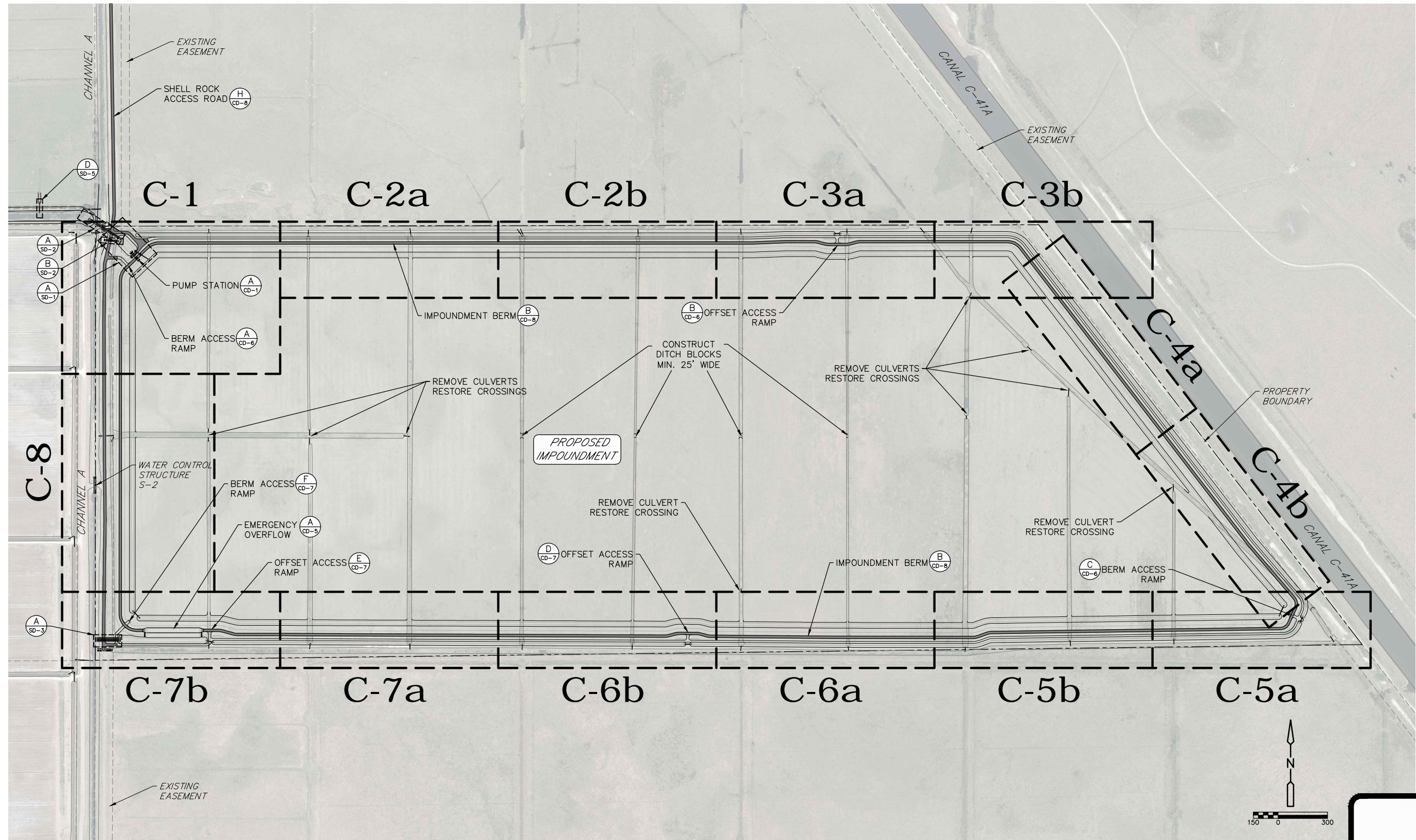


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 FL P.E. No. 31118





No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

IMPOUNDMENT  
 KEY MAP

Royal Consulting Services, Inc.  
 211 West Warren Avenue  
 Longwood, FL 32750  
 (407) 831-5095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290

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Richard A. Jones, P.E.  
 FL P.E. No. 31118

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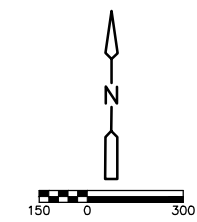
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 Scale: As Shown  
 Date: 3-5-2018  
 Design: R.A.J.  
 Drawn: J.J.D.  
 Checked: D.C.R.  
 Approved: B.L.R.

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY FLORIDA

ACCESS ROAD AND  
 CHANNEL B DIVERSION  
 KEY MAP

Royal Consulting Services, Inc.  
 211 West Warren Avenue  
 Longwood, FL 32750  
 (407) 831-5095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290



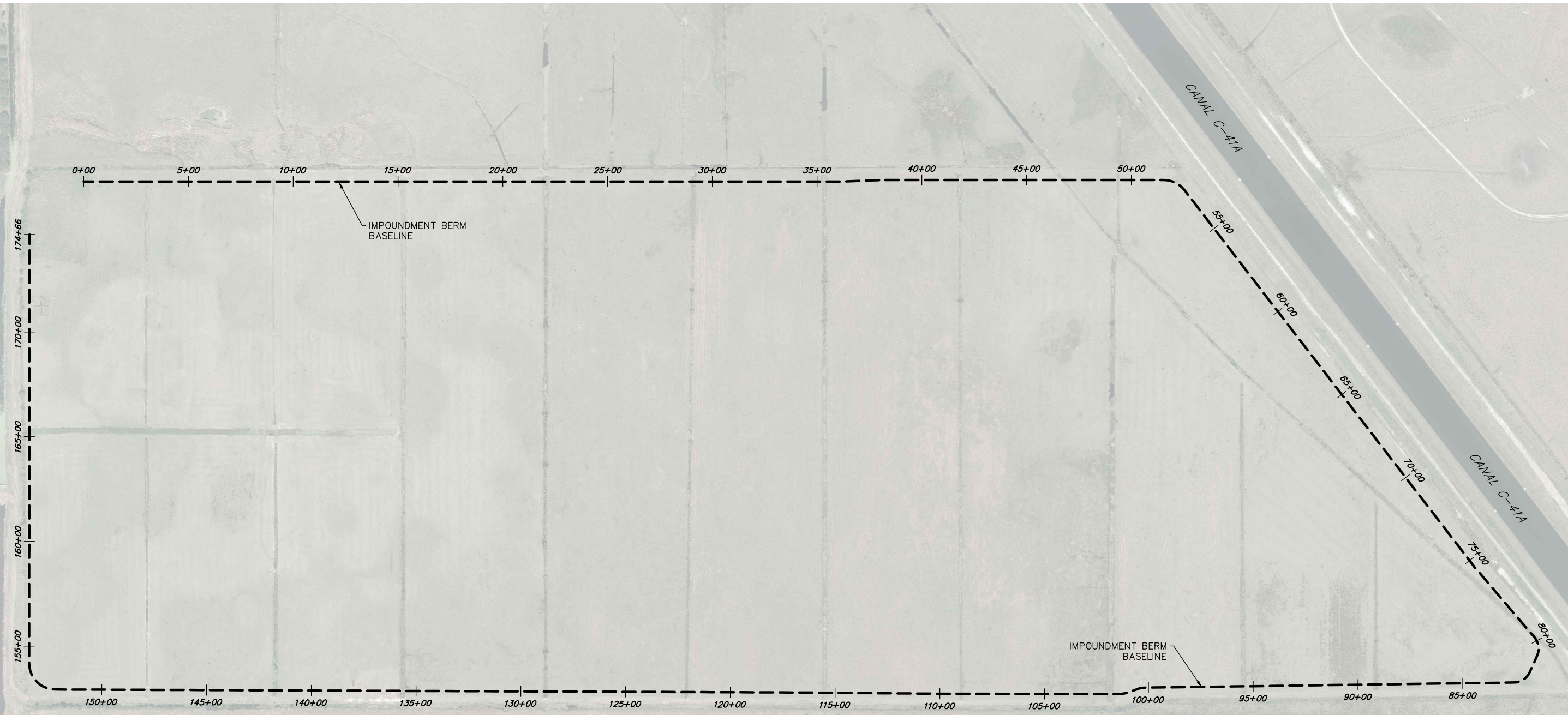
**For Review**

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 FL P.E. No. 31118

SHEET  
**G-4**





Impoundment Berm Baseline Station Coordinates											
Station Number	Northing Y	Easting X	Existing Elevation (ft NAVD)	Station Number	Northing Y	Easting X	Existing Elevation (ft NAVD)	Station Number	Northing Y	Easting X	Existing Elevation (ft NAVD)
0 + 00	1073972.72	580377.06	30.5	60 + 00	1073352.41	586076.19	31.1	120 + 00	1071534.30	583463.11	28.9
5 + 00	1073972.72	580877.06	30.9	65 + 00	1072956.03	586380.95	31.0	125 + 00	1071536.34	582963.11	28.8
10 + 00	1073972.72	581377.06	31.0	70 + 00	1072559.64	586685.72	31.4	130 + 00	1071538.38	582463.11	29.3
15 + 00	1073972.72	581877.06	30.8	75 + 00	1072163.26	586990.48	30.8	135 + 00	1071540.43	581963.12	28.6
20 + 00	1073972.73	582377.06	29.9	80 + 00	1071780.28	587311.61	29.3	140 + 00	1071542.47	581463.12	30.9
25 + 00	1073972.73	582877.06	29.5	85 + 00	1071577.20	586958.38	29.5	145 + 00	1071544.51	580963.13	30.8
30 + 00	1073972.73	583377.06	29.2	90 + 00	1071570.21	586458.43	29.1	150 + 00	1071546.55	580463.13	30.1
35 + 00	1073972.73	583877.06	28.9	95 + 00	1071563.22	585958.48	28.6	155 + 00	1071754.81	580117.08	29.7
40 + 00	1073980.59	584376.91	29.0	100 + 00	1071556.24	585458.53	29.4	160 + 00	1072254.81	580117.37	30.0
45 + 00	1073980.59	584876.91	29.6	105 + 00	1071526.23	584963.08	28.4	165 + 00	1072754.81	580117.66	31.7
50 + 00	1073980.58	585376.91	30.7	110 + 00	1071526.91	584463.08	28.7	170 + 00	1073254.81	580117.95	31.0
55 + 00	1073748.80	585771.43	31.0	115 + 00	1071531.48	583963.10	28.9	174 + 66	1073720.94	580118.22	30.8

**For Review**  
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No.	Date	Revision

HIGHLANDS COUNTY BCC  
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 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

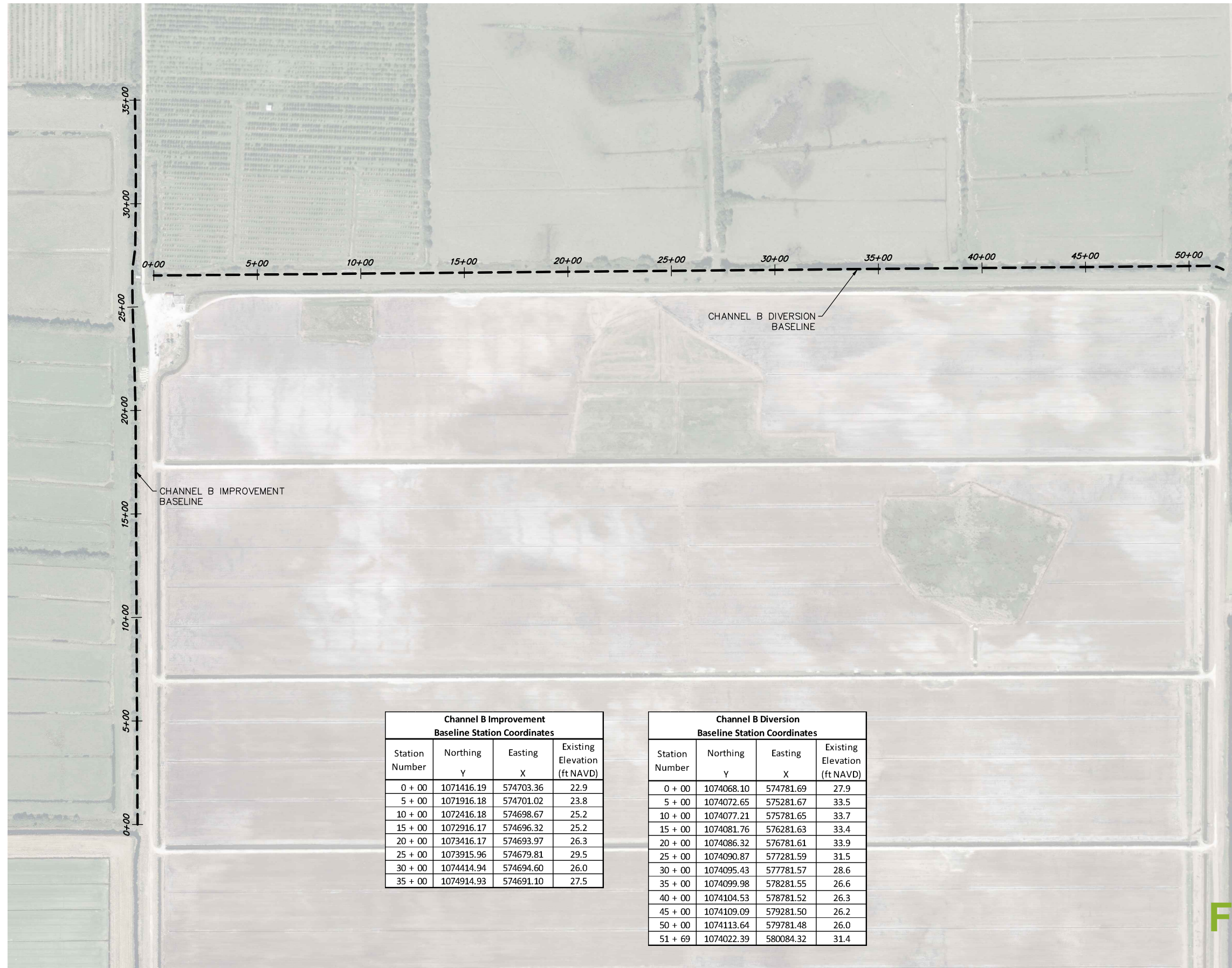
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 (407) 831-5095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290

Richard A. Jones, P.E.  
 FL P.E. No. 31118

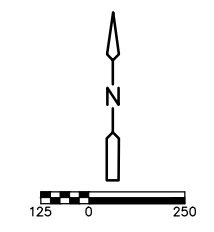
SHEET  
 G-5





Channel B Improvement Baseline Station Coordinates			
Station Number	Northing Y	Easting X	Existing Elevation (ft NAVD)
0 + 00	1071416.19	574703.36	22.9
5 + 00	1071916.18	574701.02	23.8
10 + 00	1072416.18	574698.67	25.2
15 + 00	1072916.17	574696.32	25.2
20 + 00	1073416.17	574693.97	26.3
25 + 00	1073915.96	574679.81	29.5
30 + 00	1074414.94	574694.60	26.0
35 + 00	1074914.93	574691.10	27.5

Channel B Diversion Baseline Station Coordinates			
Station Number	Northing Y	Easting X	Existing Elevation (ft NAVD)
0 + 00	1074068.10	574781.69	27.9
5 + 00	1074072.65	575281.67	33.5
10 + 00	1074077.21	575781.65	33.7
15 + 00	1074081.76	576281.63	33.4
20 + 00	1074086.32	576781.61	33.9
25 + 00	1074090.87	577281.59	31.5
30 + 00	1074095.43	577781.57	28.6
35 + 00	1074099.98	578281.55	26.6
40 + 00	1074104.53	578781.52	26.3
45 + 00	1074109.09	579281.50	26.2
50 + 00	1074113.64	579781.48	26.0
51 + 69	1074022.39	580084.32	31.4



For Review

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Job: 0202-02-ES  
 Scale: As Shown  
 Date: 3-5-2018  
 Design: R.A.J.  
 Drawn: J.J.D.  
 Checked: D.C.R.  
 Approved: B.L.R.

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 211 West Warren Avenue  
 Longwood, FL 32750  
 (407) 831-5095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290

SHEET  
 G-6

Richard A. Jones, P.E.  
 FL P.E. No. 31118







## SOIL BORING, SAMPLING AND TESTING METHODS

(abbreviated version for project specific methods and soil conditions)

**GENERAL**

Andersen Andre Consulting Engineers, Inc. (AAACE) borings describe subsurface conditions only at the locations drilled and at the time drilled. They provide no information about subsurface conditions below the bottom of the boreholes. At locations not explored, surface conditions that differ from those observed in the borings may exist and should be anticipated.

The information reported on our boring logs is based on our drillers' logs and on visual examination in our laboratory of disturbed soil samples recovered from the borings. The distinction shown on the logs between soil types is approximate only. The actual transition from one soil to another may be gradual and indistinct.

The groundwater depth shown on our boring logs is the water level the driller observed in the borehole when it was drilled. These water levels may have been influenced by the drilling procedures, especially in borings made by rotary drilling with bentonitic drilling mud. An accurate determination of groundwater level requires long-term observation of suitable monitoring wells. Fluctuations in groundwater levels throughout the year should be anticipated.

The absence of a groundwater level on certain logs indicates that no groundwater data is available. It does not mean that groundwater will not be encountered at that boring location at some other point in time.

**HAND AUGER BORINGS**

Hand auger borings are used, if soil conditions are favorable, when the soil strata are to be determined within a shallow (approximately 5-foot [1.5m]) depth or when access is not available to power drilling equipment. A 3-inch (75mm) diameter hand bucket auger with a cutting head is simultaneously turned and pressed into the ground. The bucket auger is retrieved at approximately 6-inch (0.15m) interval and its contents emptied for inspection. On occasion post-hole diggers are used, especially in the upper 3 feet (1m) or so. Penetrometer probings can be used in the upper 5 feet (1.5m) to determine the relative density of the soils. The soil sample obtained is described and representative samples put in bags or jars and transported to the AAACE soils laboratory for classification and testing, if necessary.

**STANDARD PENETRATION TEST**

The Standard Penetration Test (SPT) is a widely accepted method of in situ testing of foundation soils (ASTM D-1586). A 2-foot (0.6m) long, 2-inch (50mm) O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 24 inches (0.60m) into the ground by successive blows of a 140-pound (63.5 Kg) hammer freely dropping 30 inches (0.76m). The number of blows needed for each 6 inches (0.15m) increments penetration is recorded. The sum of the blows required for penetration of the middle two 6-inch (0.15m) increments of penetration constitutes the test result of N-value. After the test, the sampler is extracted from the ground and opened to allow visual description of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load. The following tables relate N-values to a qualitative description of soil density for cohesionless soils:

Cohesionless Soils:	N-Value	Description
	0 to 4	Very loose
	4 to 10	Loose
	10 to 30	Medium dense
	30 to 50	Dense
	Above 50	Very dense

Cohesive Soils:	N-Value	Description	Qu
	0 to 2	Very soft	Below 0.25 tsf (25 kPa)
	2 to 4	Soft	0.25 to 0.50 tsf (25 to 50 kPa)
kPa)	4 to 8	Medium stiff	0.50 to 1.0 tsf (50 to 100 kPa)
kPa)	8 to 15	Stiff	1.0 to 2.0 tsf (100 to 200 kPa)
kPa)	15 to 30	Very stiff	2.0 to 4.0 tsf (200 to 400 kPa)
kPa)	Above 30	Hard	Above 4.0 tsf (400 kPa)

The tests are usually performed at 5 foot (1.5m) intervals. However, more frequent or continuous testing is done by AAACE through depths where a more accurate definition of the soils is required. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid. After completion of a test borings, the hole is kept open until a steady state groundwater level is recorded. The hole is then sealed by backfilling, either with accumulated cuttings or lean cement.

Representative split-spoon samples from each sampling interval and from different strata are brought to our laboratory in air-tight jars for classification and testing, if necessary. Afterwards, the samples are discarded unless prior arrangement have been made.

**SFWMD EXFILTRATION TESTS (USUAL CONDITION TEST)**

In order to estimate the hydraulic conductivity of the upper soils, constant head or falling head exfiltration tests can be performed. These tests are performed in accordance with methods described in the South Florida Water Management District (SFWMD) Permit Information Manual, Volume IV. In brief, for the "Usual Condition Test", a 6 to 9 inch diameter hole is augered to depths of about 5 to 7 feet; the bottom one foot is filled with 57-stone; and a 6-foot long slotted PVC pipe is lowered into the hole. The distance from the groundwater table and to the ground surface is recorded and the hole is then saturated for 10 minutes with the water level maintained at the ground surface.

If a constant head test is performed, the rate of pumping will be recorded at fixed intervals of 1 minute for a total of 10 minutes, following the saturation period.

**LABORATORY TEST METHODS**

Soil samples returned to the AAACE soils laboratory are visually observed by a geotechnical engineer or a trained technician to obtain more accurate description of the soil strata. Laboratory testing is performed on selected samples as deemed necessary to aid in soil classification and to help define engineering properties of the soils. The test results are presented on the soil boring logs at the depths at which the respective sample was recovered, except that grain size distributions or selected other test results may be presented on separate tables, figures or plates as discussed in this report. The soil descriptions shown on the logs are based upon visual-manual procedures in accordance with local practice. Soil classification is performed in general accordance with the United Soil Classification System (ASTM D-2487) and is also based on visual-manual procedures.

**THE PROJECT SOIL DESCRIPTION PROCEDURE FOR SOUTHEAST FLORIDA**

For use with the ASTM D-2487 Unified Soil Classification System

**CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES**

**BOULDERS (>12" [300 MM]) and COBBLES (3" [75 MM] TO 12" [300 MM]):**

**GRAVEL:** Coarse Gravel: 3/4" (19 mm) to 3" (75 mm)  
 Fine Gravel: No. 4 (4.75 mm) Sieve to 3/4" (19 mm)

**Descriptive adjectives:**  
 0 - 5% - no mention of gravel in description  
 5 - 15% - trace  
 15 - 29% - some  
 30 - 49% - gravelly (shell, limerock, cemented sands)

**SANDS:**

**COARSE SAND:** No. 10 (2 mm) Sieve to No. 4 (4.75 mm) Sieve  
**MEDIUM SAND:** No. 40 (425 Fm) Sieve to No. 10 (2 mm) Sieve  
**FINE SAND:** No. 200 (75 Fm) Sieve to No. 40 (425 Fm) Sieve

**Descriptive adjectives:**  
 0 - 5% - no mention of sand in description  
 5 - 15% - trace  
 15 - 29% - some  
 30 - 49% - sandy

**SILT/CLAY:** < #200 (75 Fm) Sieve

**SILTY OR SILT:** PI < 4  
**SILTY CLAYEY OR SILTY CLAY:** 4 # PI # 7  
**CLAYEY OR CLAY:** PI > 7

**Descriptive adjectives:**  
 < - 5% - clean (no mention of silt or clay in description)  
 5 - 15% - slightly  
 16 - 35% - clayey, silty, or silty clayey  
 36 - 49% - very

**ORGANIC SOILS:**

Organic Content	Descriptive Adjectives	Classification
0 - 2.5%	Usually no mention of org.	See Above
2.6 - 5%	slightly organic	add "with organic fines" to group name
5 - 30%	organic	SM with organic fines Organic Silt (OL) Organic Clay (OL) Organic Silt (OH) Organic Clay (OH)

**NOTES:**

- TB-# STANDARD PENETRATION TEST (SPT) BORING [ASTM D1586]
- N SPT RESISTANCE IN BLOWS PER FOOT
- X.X' GROUNDWATER TABLE (GWT) MEASURED ON THE DATE DRILLED
- N.E. NOT ENCOUNTERED
- EOB END OF BORING
- BLS BELOW LAND SURFACE
- SP, SP-SM, ETC: UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) USCS GROUPS DETERMINED BY VISUAL CLASSIFICATION, EXCEPT FOR NOTED LABORATORY TEST RESULTS.
- MC NATURAL MOISTURE CONTENT IN PERCENT [ASTM D2216]
- OC ORGANIC CONTENT IN PERCENT [ASTM D2974]
- 200 PERCENT PASSING NO. 200 SIEVE SIZE (PERCENT FINES) [ASTM D1140]

**SPT BORING DATA**  
 DRILL CREW: CL/DTH/AAACE  
 DRILL RIGS: CME-45/MOBILE B-57  
 DRILL METHOD: ROTARY-WASH W. BENTONITE DRILLING SLURRY  
 SPT DATA:  
 SPOON I.D. = 1.375"  
 SPOON O.D. = 2.0"  
 HAMMER DROP = 30"  
 HAMMER WEIGHT = 140 lbs.  
 HAMMER TYPE = MANUAL

**SOIL LEGEND:**

- ORGANICS/PEAT
- FINE SAND W. T/O SILT/CLAY (SP)
- SLIGHTLY SILTY FINE SAND (SP-SM)
- SILTY FINE SAND (SM)
- SLIGHTLY CLAYEY FINE SAND (SP-SC)
- CLAYEY FINE SAND (SC)



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834 SW Swan Avenue, Port St. Lucie, FL 34983 772-807-9191 www.AACEinc.com  
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**GENERAL NOTES**

GEOTECHNICAL ENGINEERING EVALUATION  
 ISTOKPOGA MARSH WATER IMPROVEMENT DISTRICT (IMWID)  
 PROPOSED CELL NO. 2 MINOR ABOVE-GROUND IMPOUNDMENT  
 HIGHLANDS COUNTY, FLORIDA

Drawn by: PGA	Date: January 2017
Checked by: DPA	Date: January 2017
AAACE File No: 16-112	<b>Sheet No. 1</b>

For Review

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Peter G. Andersen, P.E.  
 FL P.E. No. 57956

Revision

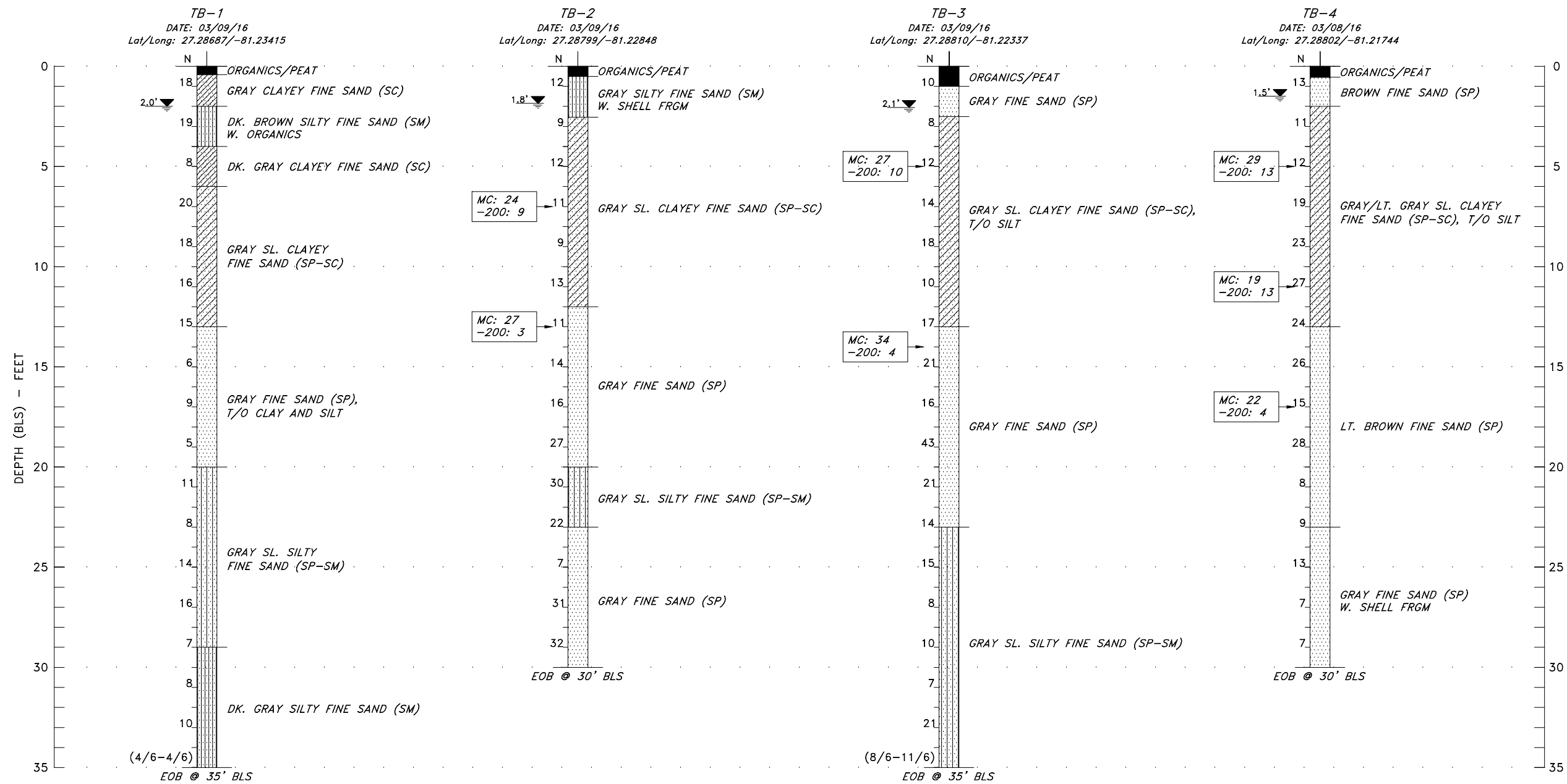
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 ISTOKPOGA MARSH WATER  
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GEOTECHNICAL ANALYSIS  
 GENERAL NOTES  
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SHEET  
 G-8



**SOIL LEGEND:**

- ORGANICS/PEAT
- FINE SAND W. T/O SILT/CLAY (SP)
- SLIGHTLY SILTY FINE SAND (SP-SM)
- SILTY FINE SAND (SM)
- SLIGHTLY CLAYEY FINE SAND (SP-SC)
- CLAYEY FINE SAND (SC)

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**SOIL BORING PROFILES**

GEOTECHNICAL ENGINEERING EVALUATION  
 ISTOKPOGA MARSH WATER IMPROVEMENT DISTRICT (IMWID)  
 PROPOSED CELL NO. 2 MINOR ABOVE-GROUND IMPOUNDMENT  
 HIGHLANDS COUNTY, FLORIDA

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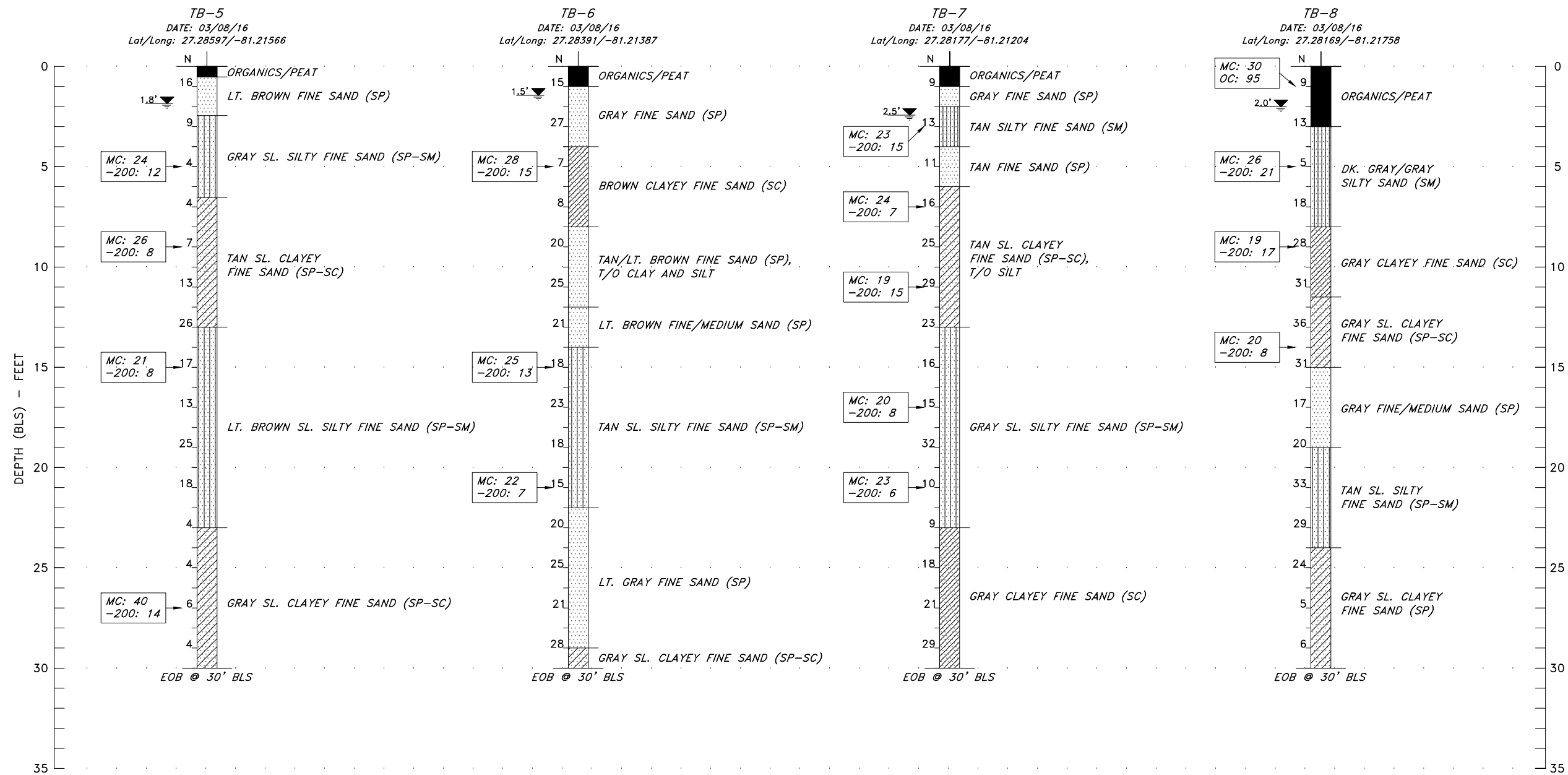
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HIGHLANDS COUNTY BCC  
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**SHEET**  
**G-9**



**SOIL LEGEND:**

- ORGANICS/PEAT
- SILTY FINE SAND (SM)
- FINE SAND W. T/O SILT/CLAY (SP)
- SLIGHTLY CLAYEY FINE SAND (SP-SC)
- SLIGHTLY SILTY FINE SAND (SP-SM)
- CLAYEY FINE SAND (SC)

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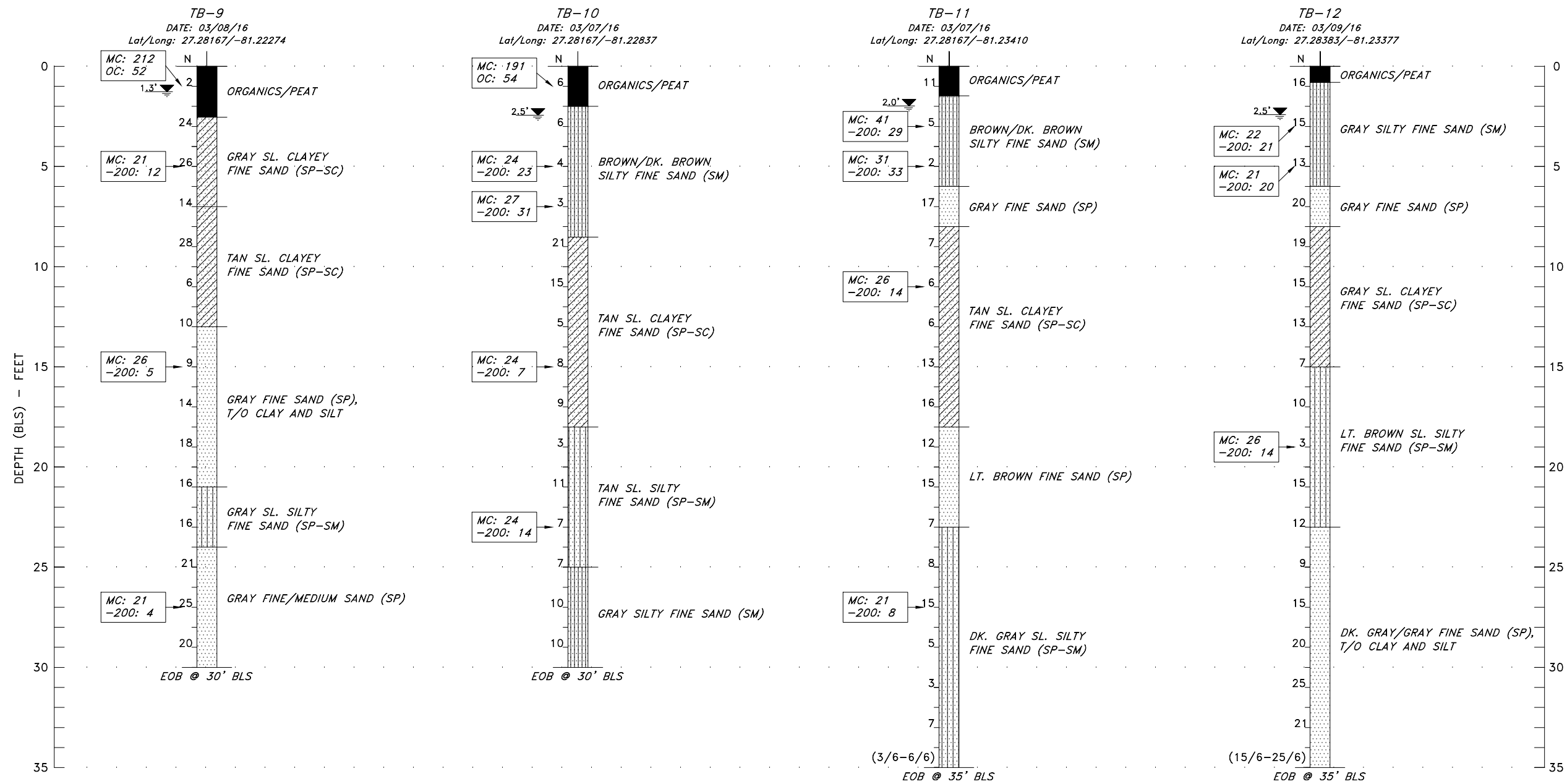
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**SHEET  
 G-10**



**SOIL LEGEND:**

- ORGANICS/PEAT
- SILTY FINE SAND (SM)
- FINE SAND W. T/O SILT/CLAY (SP)
- SLIGHTLY CLAYEY FINE SAND (SP-SC)
- SLIGHTLY SILTY FINE SAND (SP-SM)
- CLAYEY FINE SAND (SC)

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**For Review**

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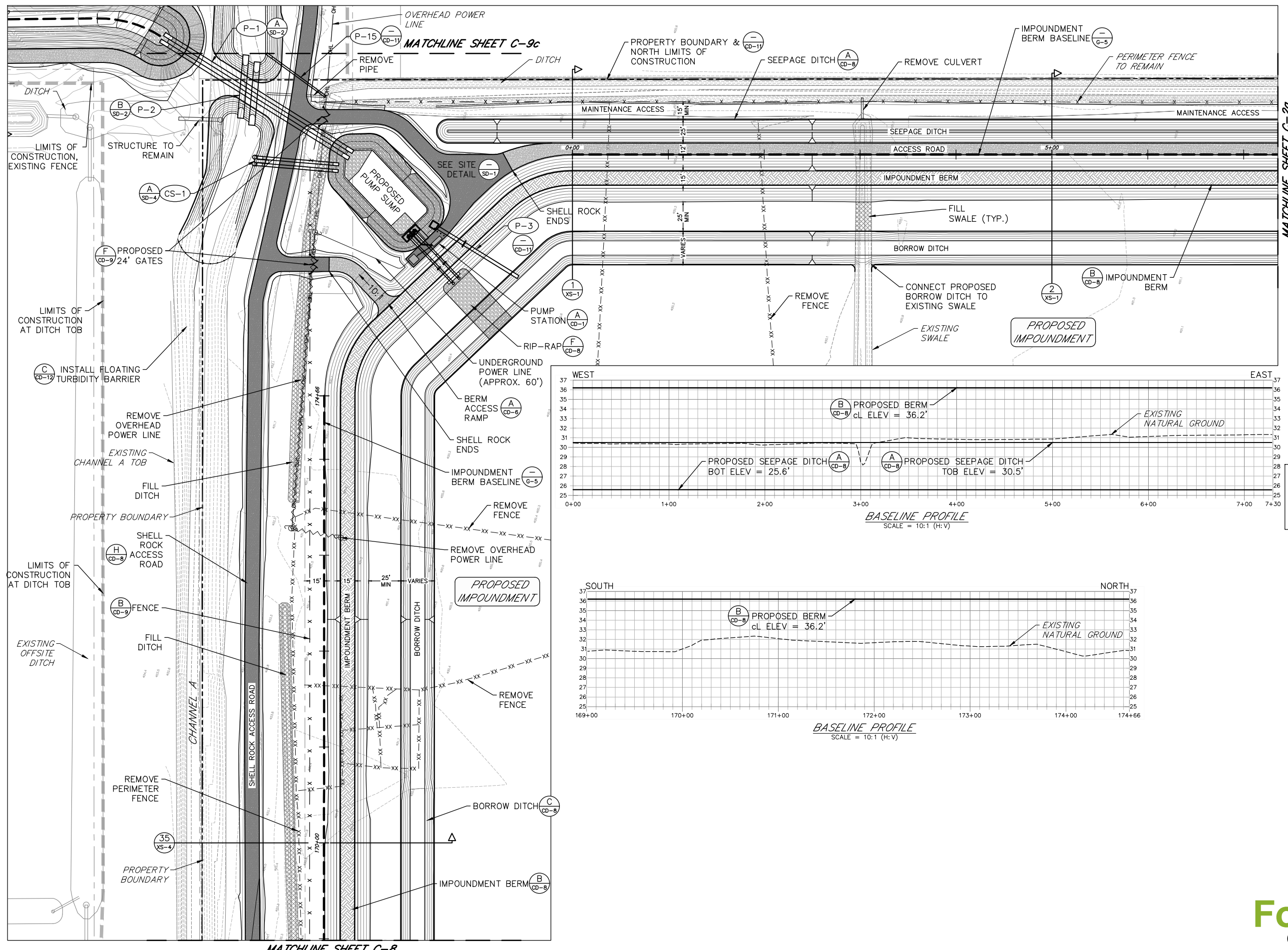
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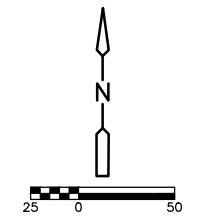
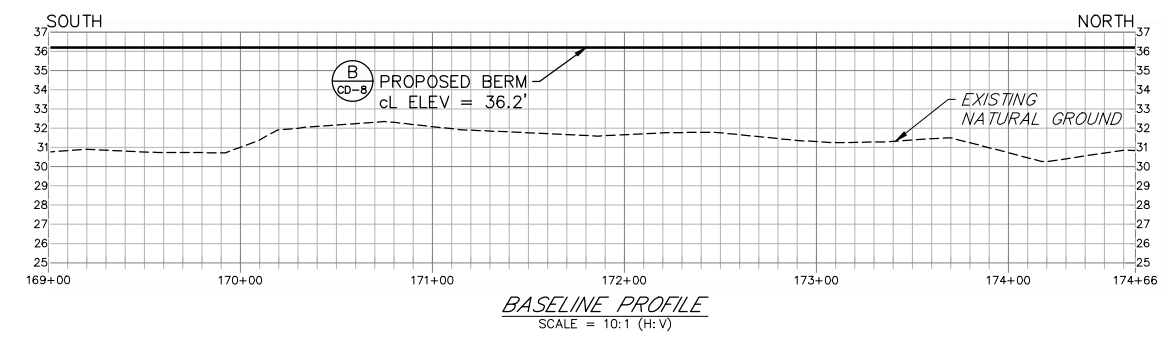
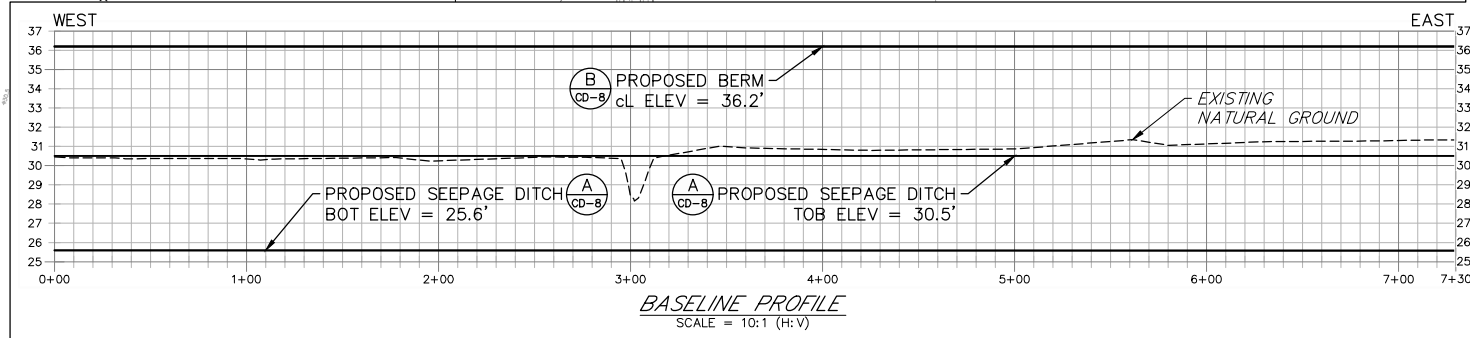
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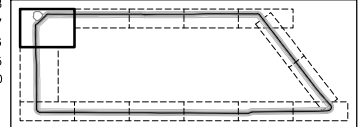


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MATCHLINE SHEET C-8



C-1



**LEGEND**

- PROPERTY BOUNDARY
- - - LIMITS OF CONSTRUCTION
- - - 45+00 CONSTRUCTION BASELINE
- - - EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- xx - xx - xx - EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE

Revision

No.	Date

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 HIGHLANDS COUNTY  
 FLORIDA

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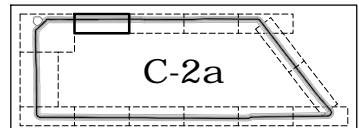
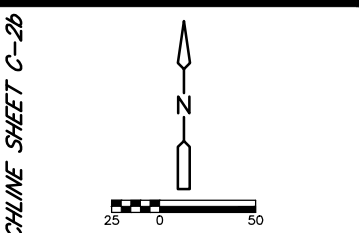
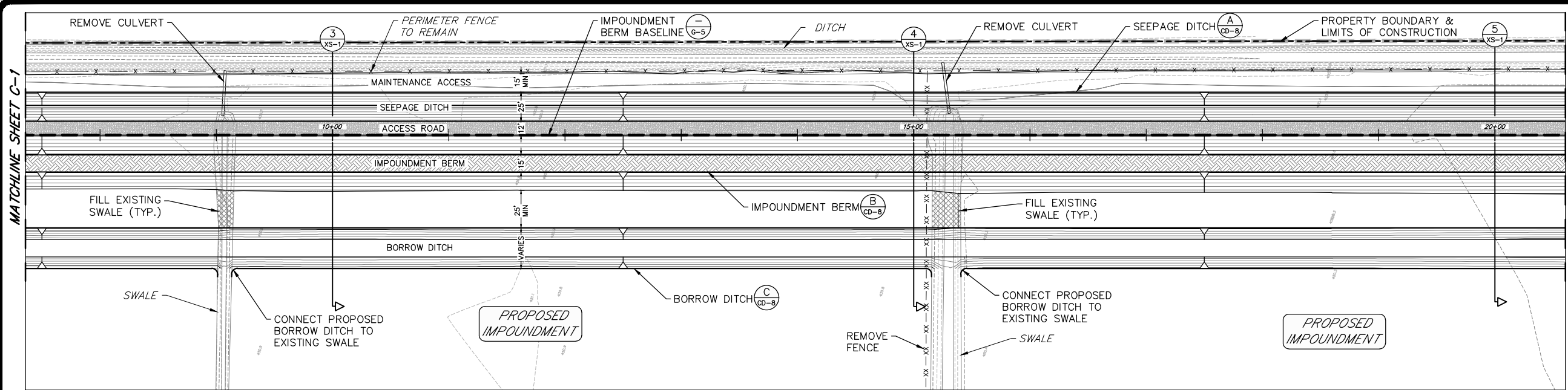
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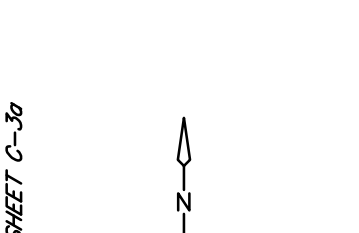
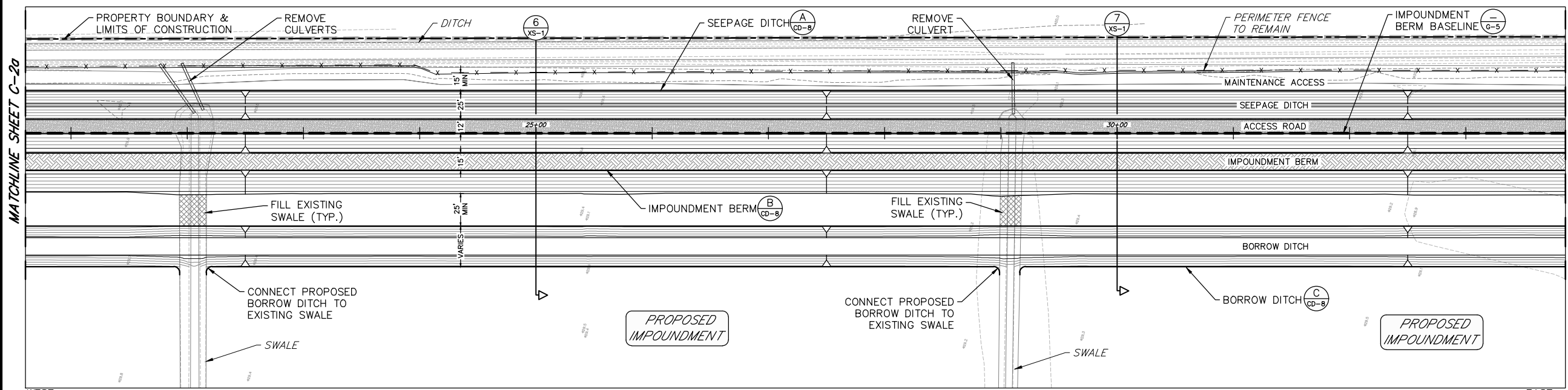
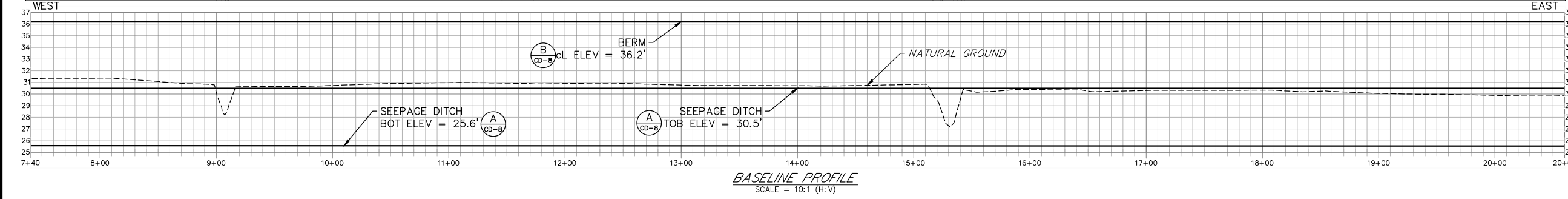
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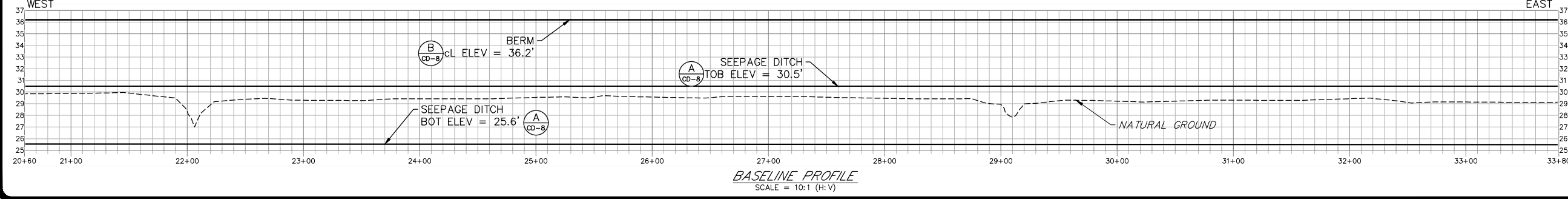
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- LEGEND**
- PROPERTY BOUNDARY
  - LIMITS OF CONSTRUCTION
  - CONSTRUCTION BASELINE
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  - x - x - EXISTING FENCE TO REMAIN
  - xx - xx - xx - EXISTING FENCE TO BE REMOVED
  - x - x - PROPOSED FENCE



- LEGEND**
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  - CONSTRUCTION BASELINE
  - EASEMENT
  - x - x - EXISTING FENCE TO REMAIN
  - xx - xx - xx - EXISTING FENCE TO BE REMOVED
  - x - x - PROPOSED FENCE



Job: 0202-02-ES  
Scale: As Shown  
Date: 3-5-2018  
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Drawn: J.J.D.  
Checked: D.C.R.  
Approved: B.L.R.

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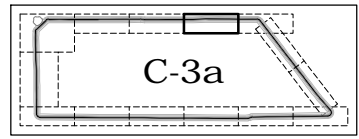
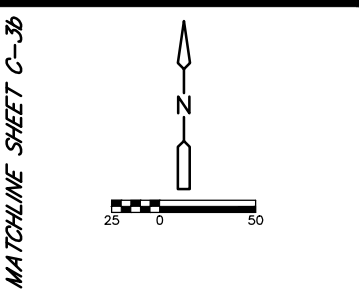
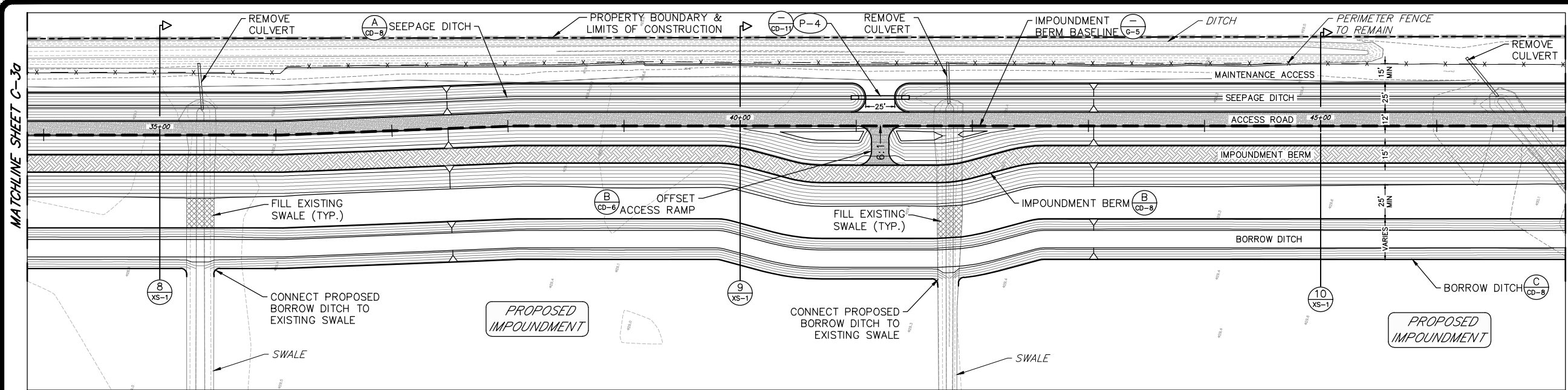
**For Review**

03/05/2018 4:26:34 PM

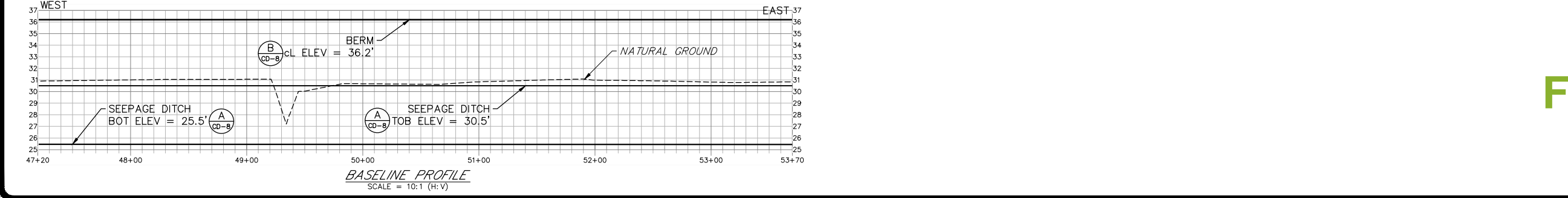
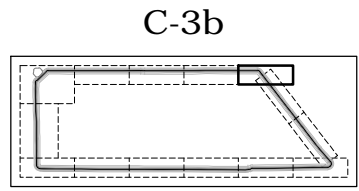
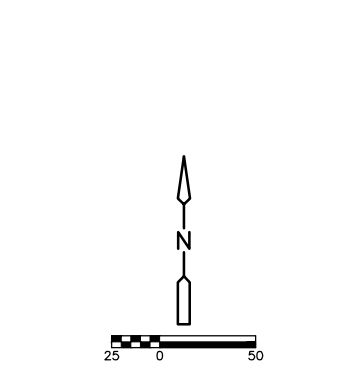
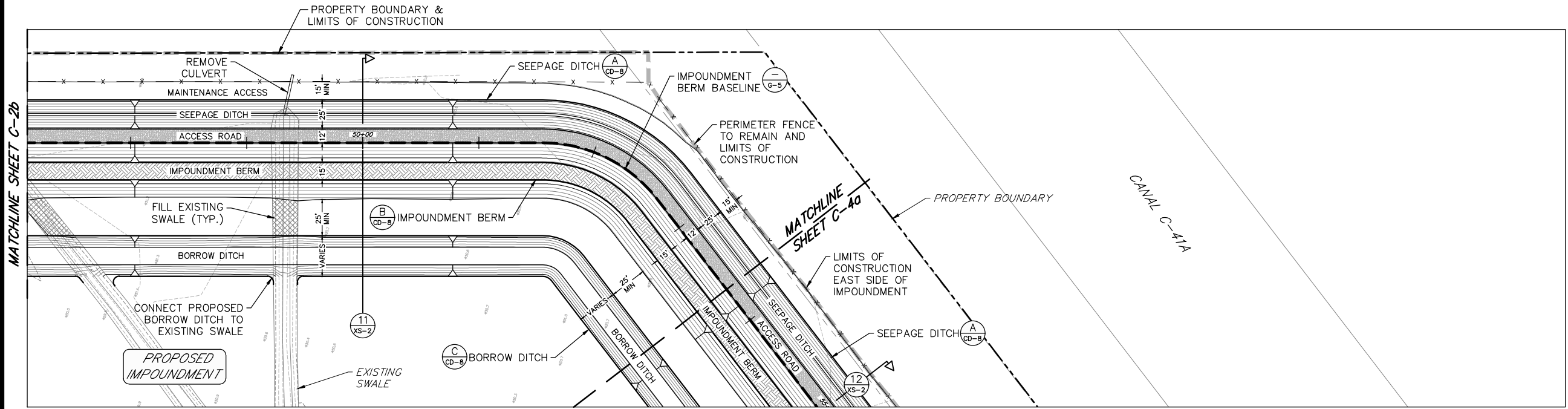
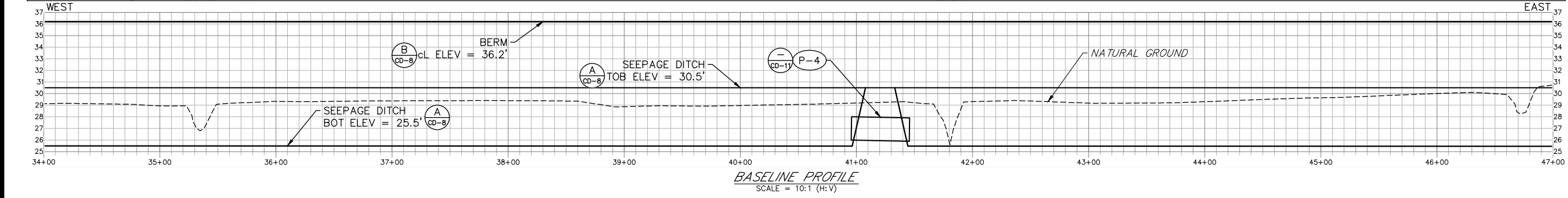
Richard A. Jones, P.E.  
FL P.E. No. 31118

SHEET  
C-2





- LEGEND**
- PROPERTY BOUNDARY
  - LIMITS OF CONSTRUCTION
  - CONSTRUCTION BASELINE
  - EASEMENT
  - x - x - EXISTING FENCE TO REMAIN
  - xx - xx - EXISTING FENCE TO BE REMOVED
  - x - x - PROPOSED FENCE



Job: 0202-02-ES  
 Scale: As Shown  
 Date: 3-5-2018  
 Design: R.A.J.  
 Drawn: J.J.D.  
 Checked: D.C.R.  
 Approved: B.L.R.

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

CIVIL SITE PLAN  
 IMPOUNDMENT

Royal Consulting Services, Inc.  
 211 West Warren Avenue  
 Longwood, FL 32750  
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 (407) 831-5095 fax  
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 FL COA No. 7290

**For Review**  
 03/05/2018 4:26:43 PM

Richard A. Jones, P.E.  
 FL P.E. No. 31118

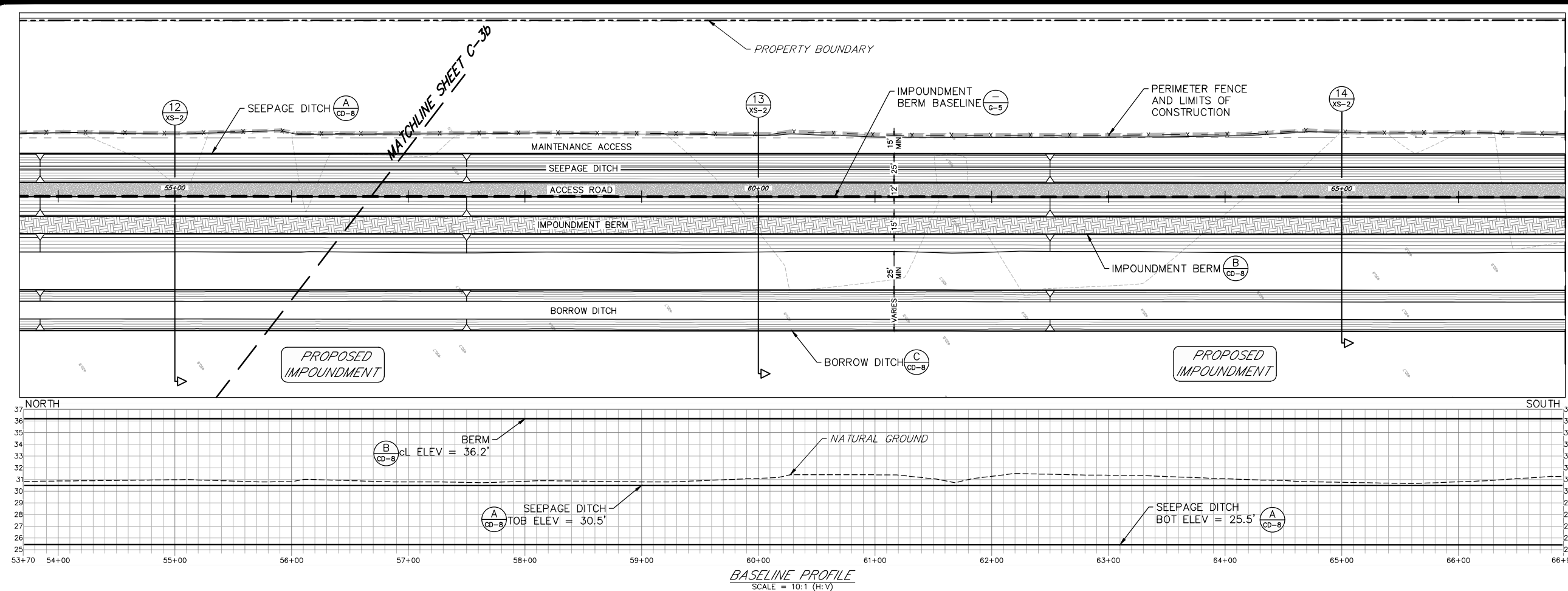
SHEET  
 C-3

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

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 FL COA No. 7290

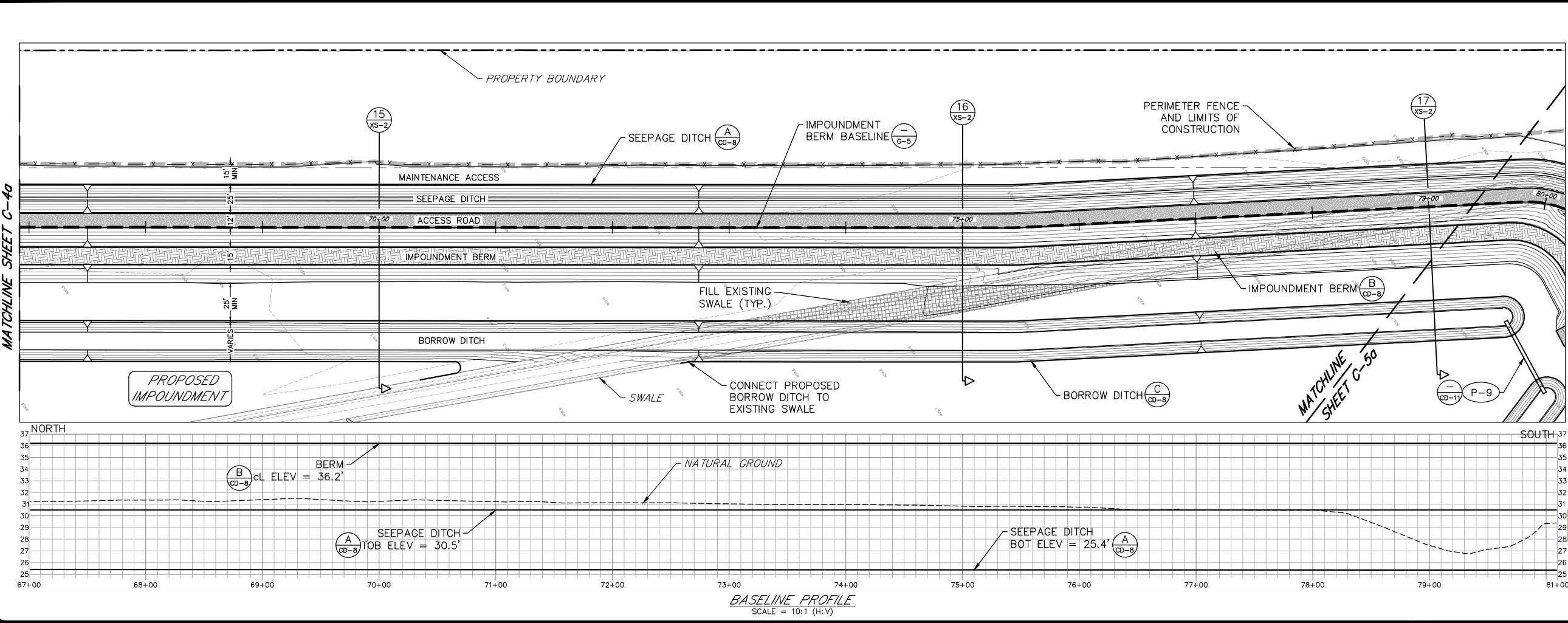


MATCHLINE SHEET C-4b

C-4a

LEGEND

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- CONSTRUCTION BASELINE
- EASEMENT
- EXISTING FENCE TO REMAIN
- EXISTING FENCE TO BE REMOVED
- PROPOSED FENCE



MATCHLINE SHEET C-4a

C-4b

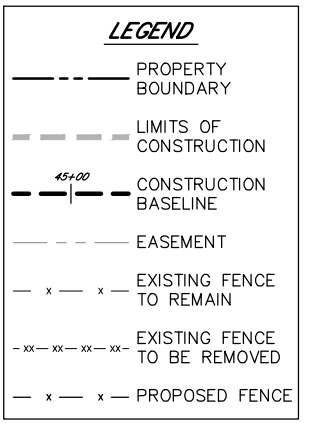
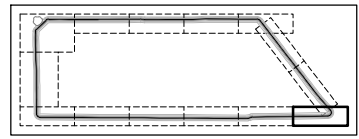
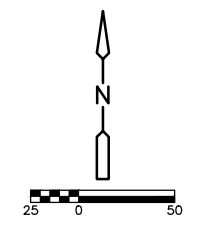
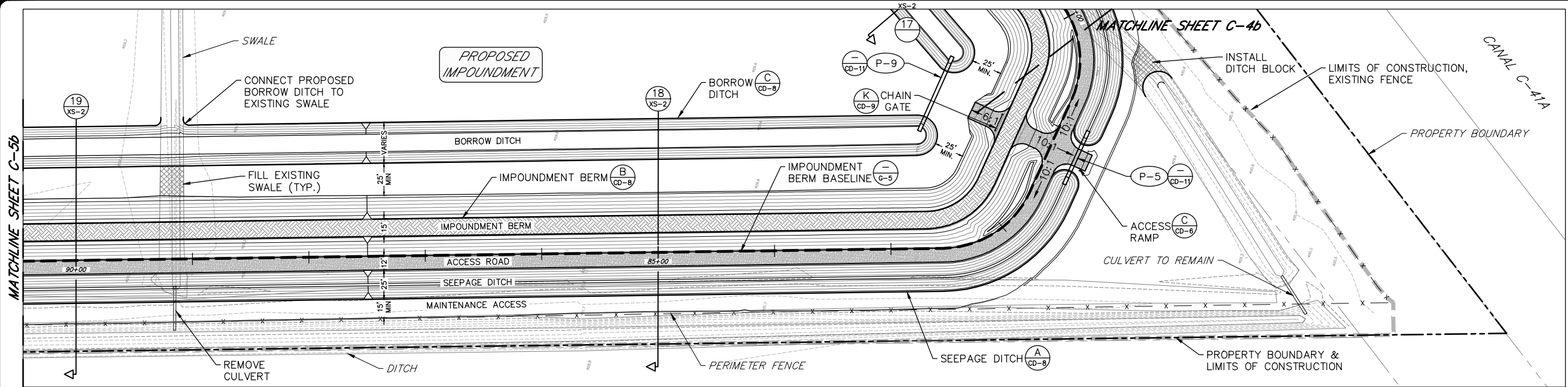
LEGEND

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- CONSTRUCTION BASELINE
- EASEMENT
- EXISTING FENCE TO REMAIN
- EXISTING FENCE TO BE REMOVED
- PROPOSED FENCE

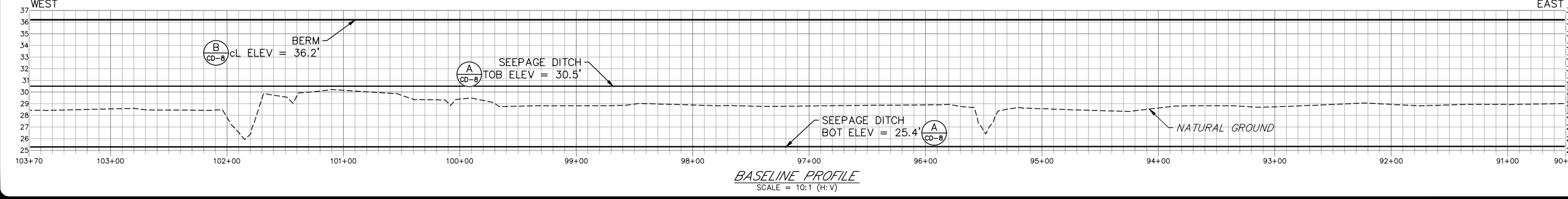
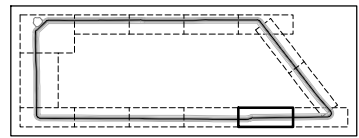
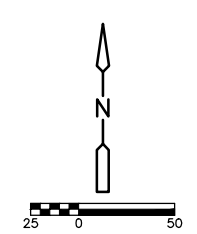
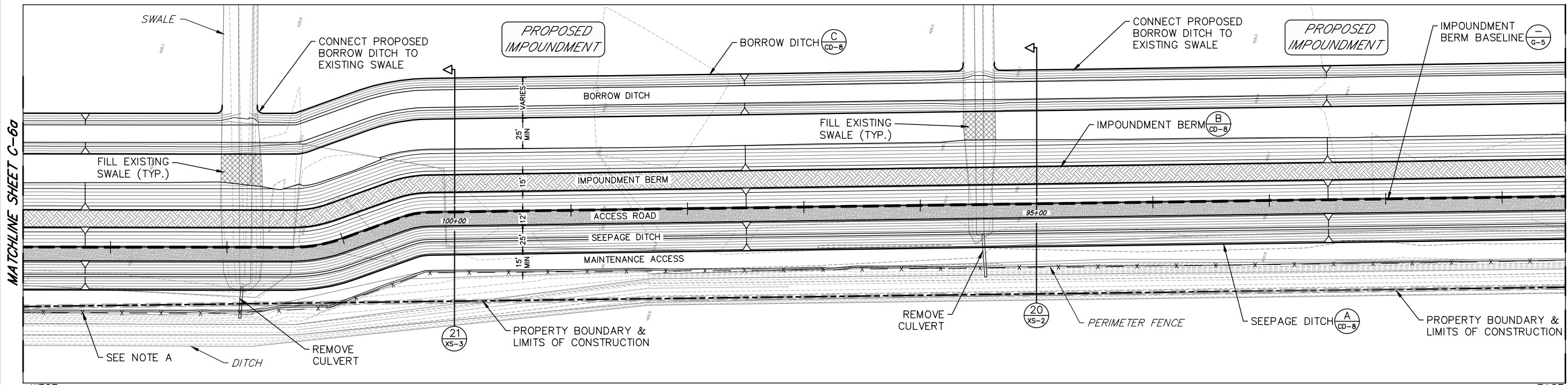
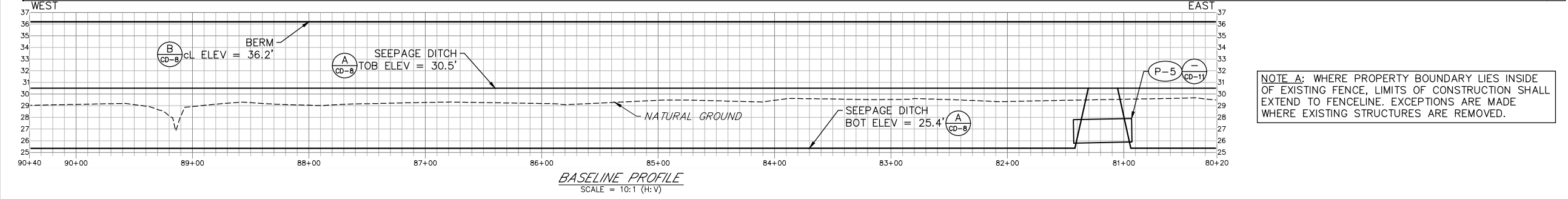
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 03/05/2018 4:26:51 PM

Richard A. Jones, P.E.  
 FL P.E. No. 31118

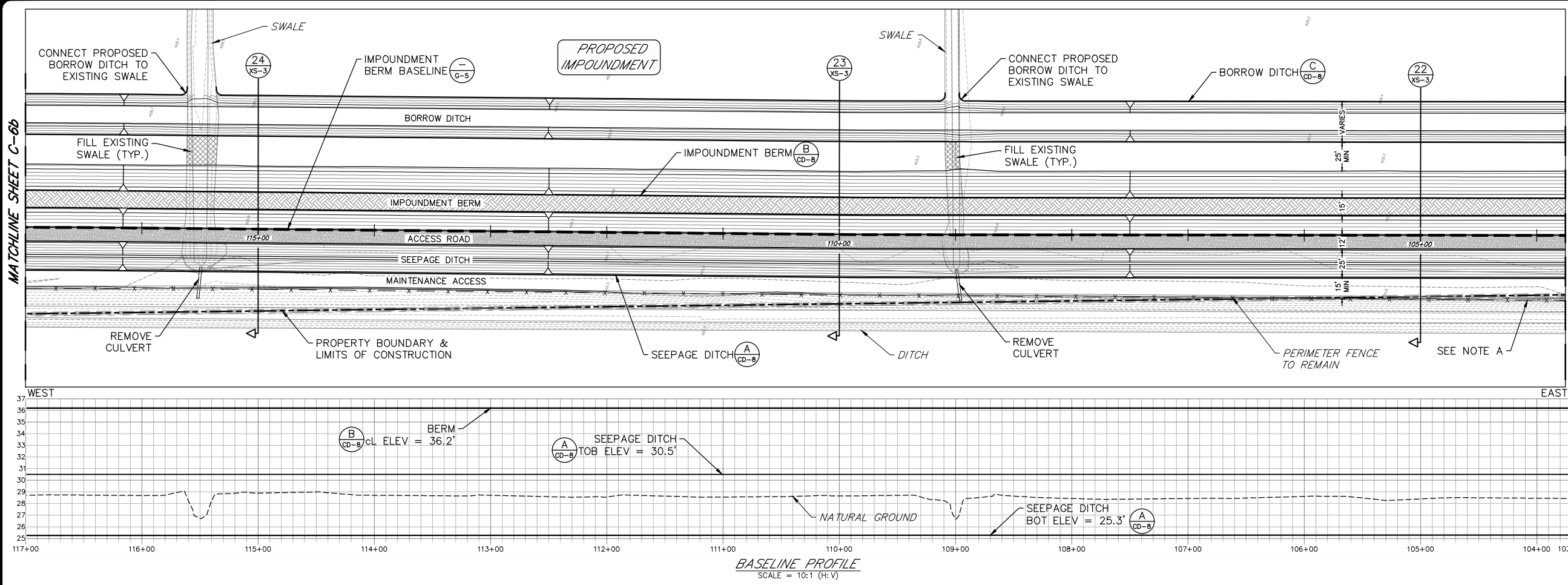




**NOTE A:** WHERE PROPERTY BOUNDARY LIES INSIDE OF EXISTING FENCE, LIMITS OF CONSTRUCTION SHALL EXTEND TO FENCELINE. EXCEPTIONS ARE MADE WHERE EXISTING STRUCTURES ARE REMOVED.



**For Review**  
 03/05/2018 4:27:00 PM



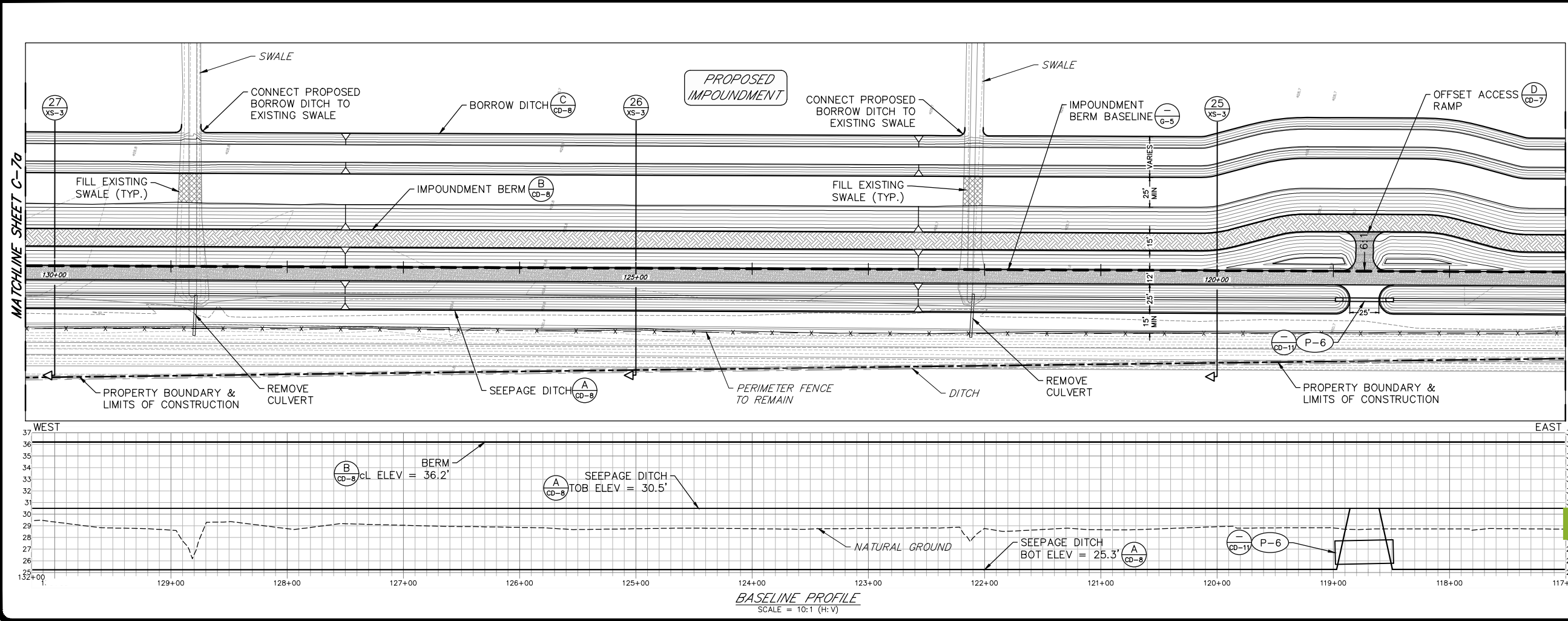
Matchline SHEET C-5b

North arrow and scale bar (0 to 50 feet).

**C-6a**

**LEGEND**

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- CONSTRUCTION BASELINE
- EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- xx - xx - EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE



Matchline SHEET C-6a

North arrow and scale bar (0 to 50 feet).

**C-6b**

**NOTE A:** WHERE PROPERTY BOUNDARY LIES INSIDE OF EXISTING FENCE, LIMITS OF CONSTRUCTION SHALL EXTEND TO FENCELINE. EXCEPTIONS ARE MADE WHERE EXISTING STRUCTURES ARE REMOVED.

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

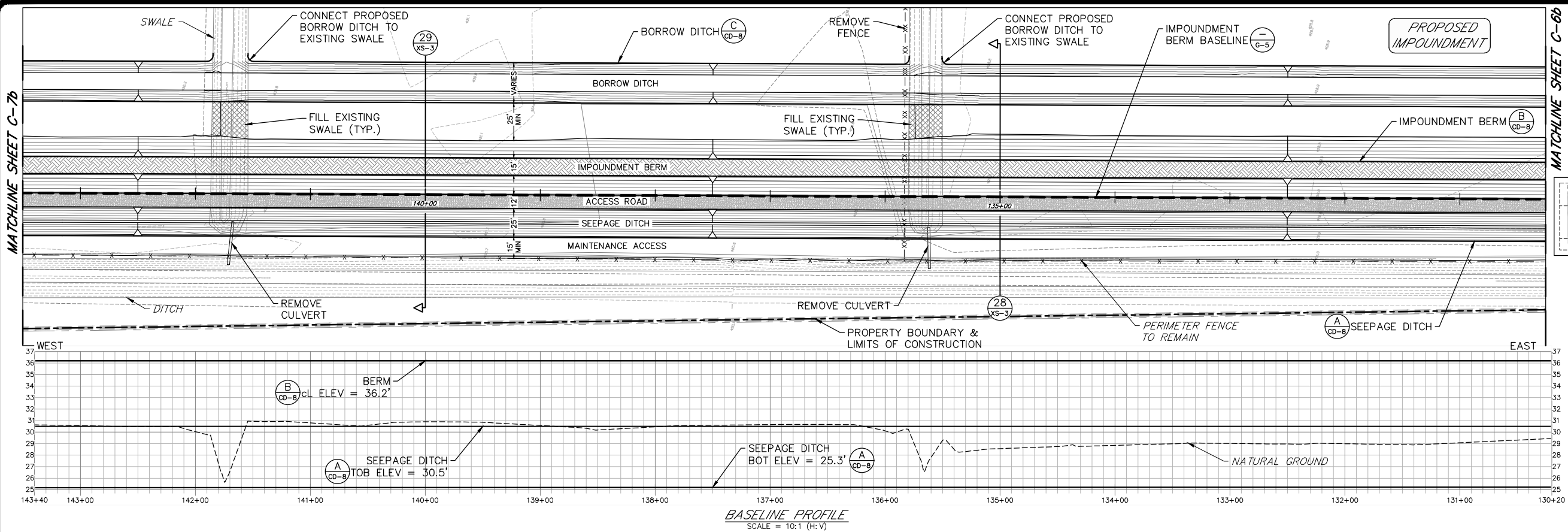
CIVIL SITE PLAN  
 IMPOUNDMENT

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 03/05/2018 4:27:08 PM

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 FL P.E. No. 31118

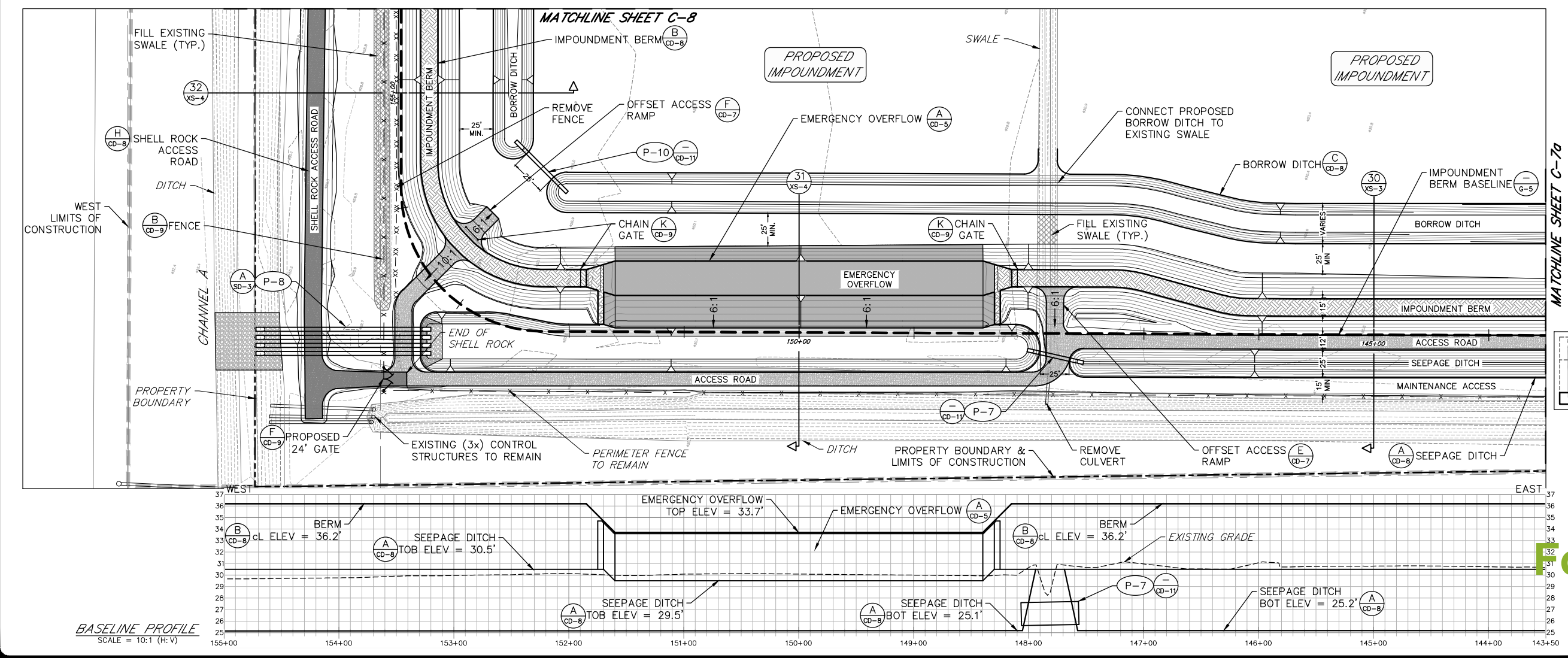




C-7a

LEGEND

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- 45+00 CONSTRUCTION BASELINE
- EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- xx-xx-xx- EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE



C-7b

LEGEND

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- 45+00 CONSTRUCTION BASELINE
- EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- xx-xx-xx- EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE

Job: 0202-02-ES  
 Scale: As Shown  
 Date: 3-5-2018  
 Design: R.A.J.  
 Drawn: J.J.D.  
 Checked: D.C.R.  
 Approved: B.L.R.

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT II  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY FLORIDA

CIVIL SITE PLAN  
 IMPOUNDMENT

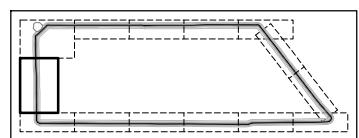
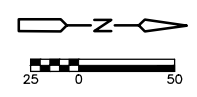
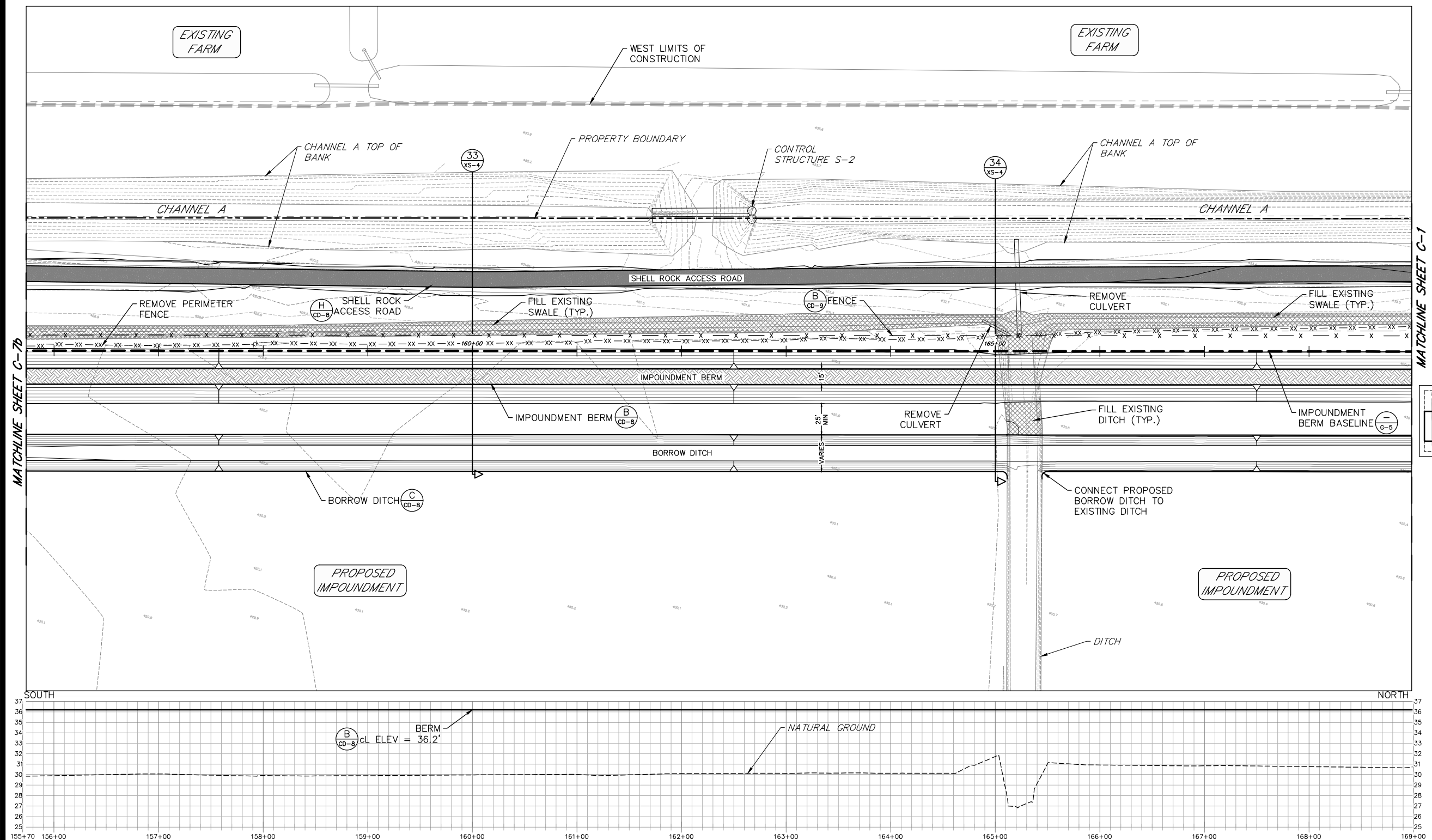
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 FL COA No. 7290

For Review

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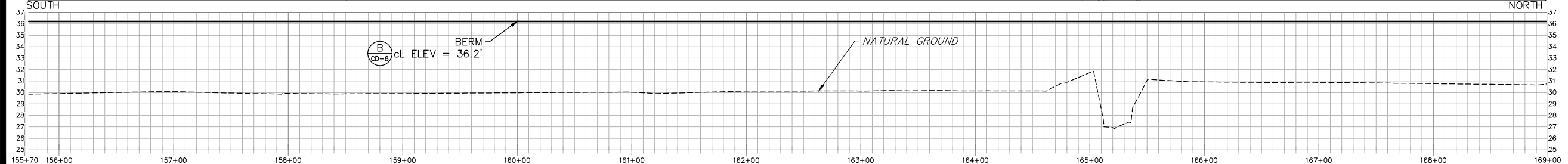
Richard A. Jones, P.E.  
 FL P.E. No. 31118

SHEET  
 C-7



**LEGEND**

- PROPERTY BOUNDARY
- - - LIMITS OF CONSTRUCTION
- - - 45+00 CONSTRUCTION BASELINE
- - - EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- xx - xx - xx - EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE



MATCHLINE SHEET C-7b

MATCHLINE SHEET C-1

Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

CIVIL SITE PLAN  
 IMPOUNDMENT

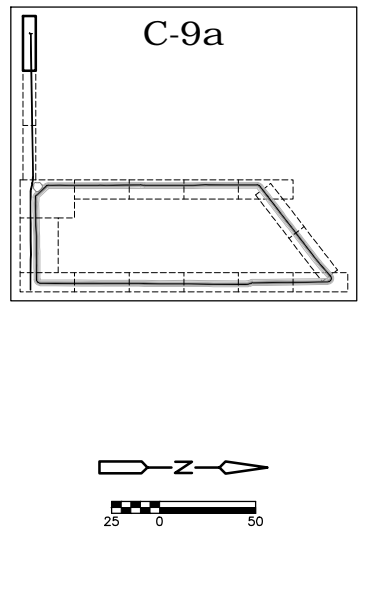
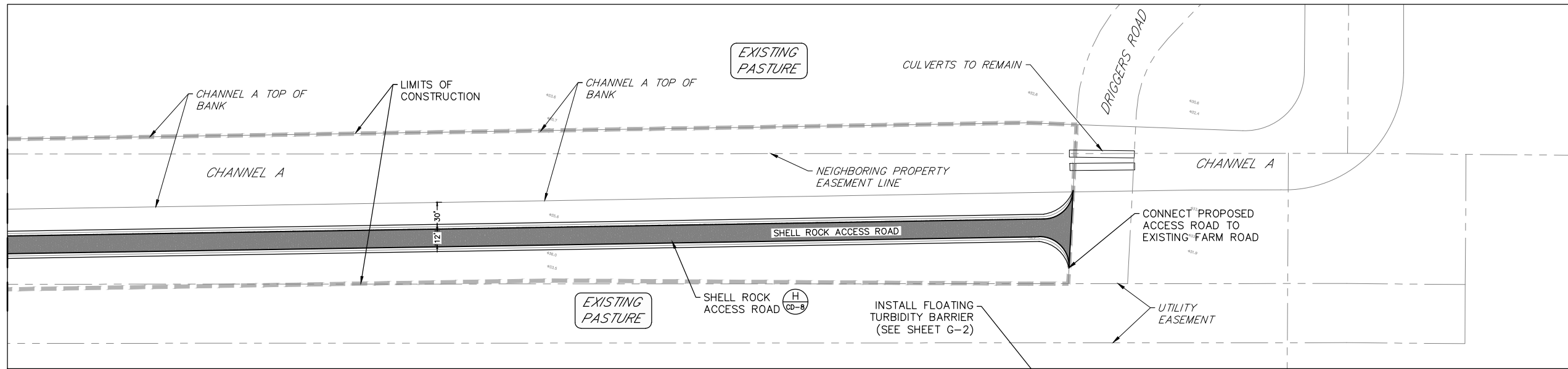
Royal Consulting Services, Inc.  
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 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290

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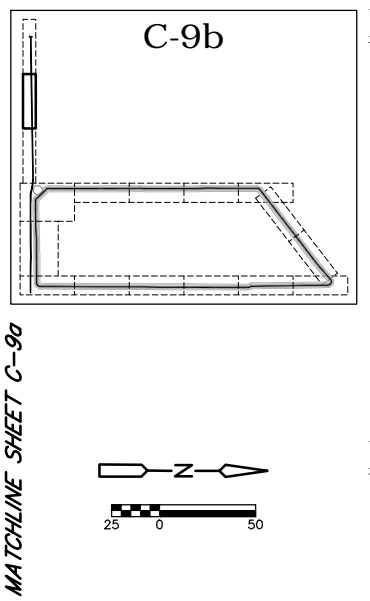
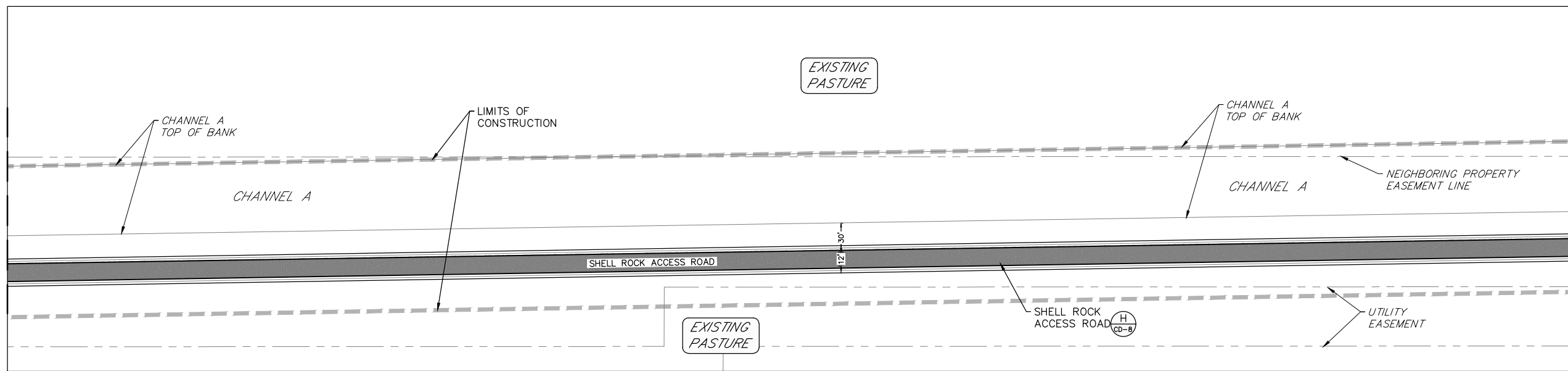
Richard A. Jones, P.E.  
 FL P.E. No. 31118

SHEET  
 C-8

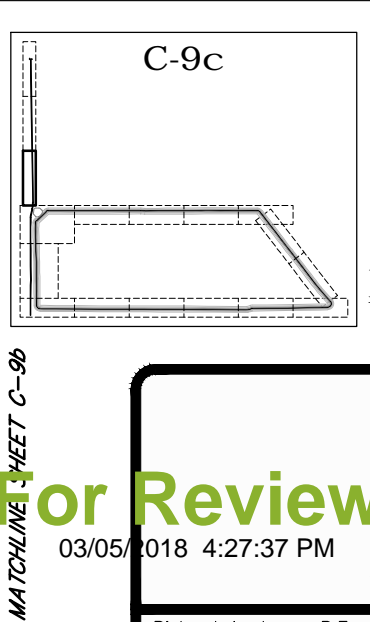
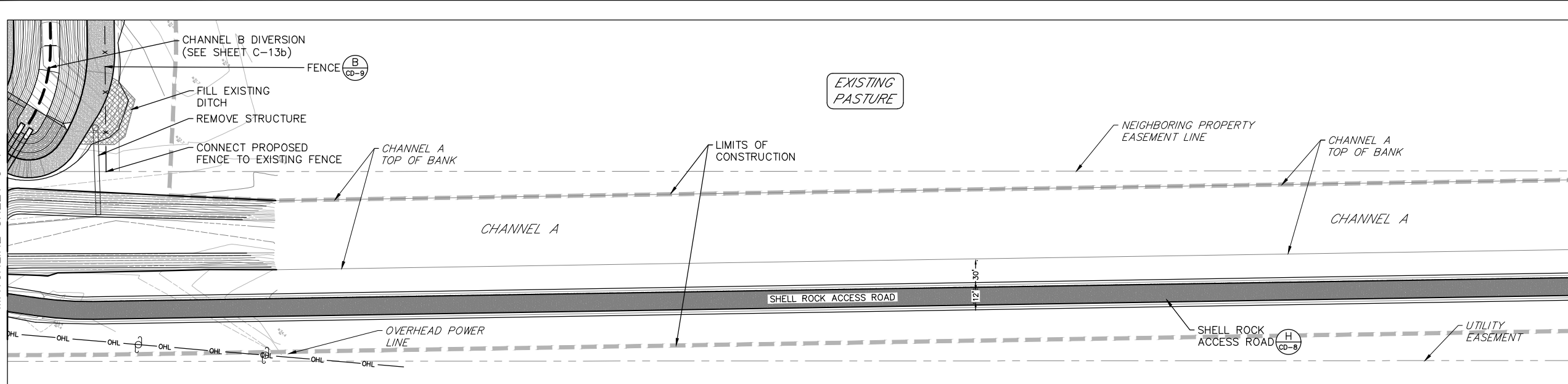
MATCHLINE SHEET C-9b



MATCHLINE SHEET C-9c



MATCHLINE SHEET C-1



For Review  
03/05/2018 4:27:37 PM

Richard A. Jones, P.E.  
FL P.E. No. 31118

Job:	0202-02-ES
Scale:	As Shown
Date:	3-5-2018
Design:	R.A.J.
Drawn:	J.J.D.
Checked:	D.C.R.
Approved:	B.L.R.
No.:	
Date:	
Revision:	

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPONDMENT DISTRICT  
 IMPONDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

CIVIL SITE PLAN  
 ACCESS ROAD

Royal Consulting Services, Inc.  
 211 West Warren Avenue  
 Longwood, FL 32750  
 (407) 831-5095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290

SHEET  
 C-9

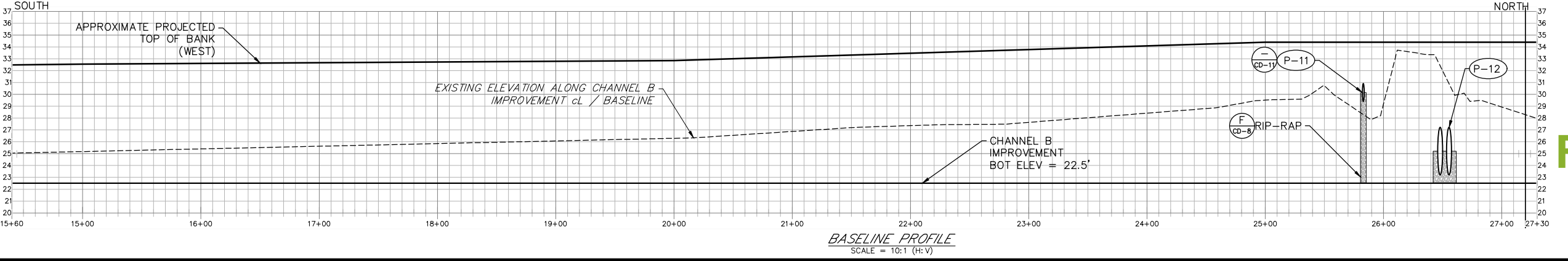
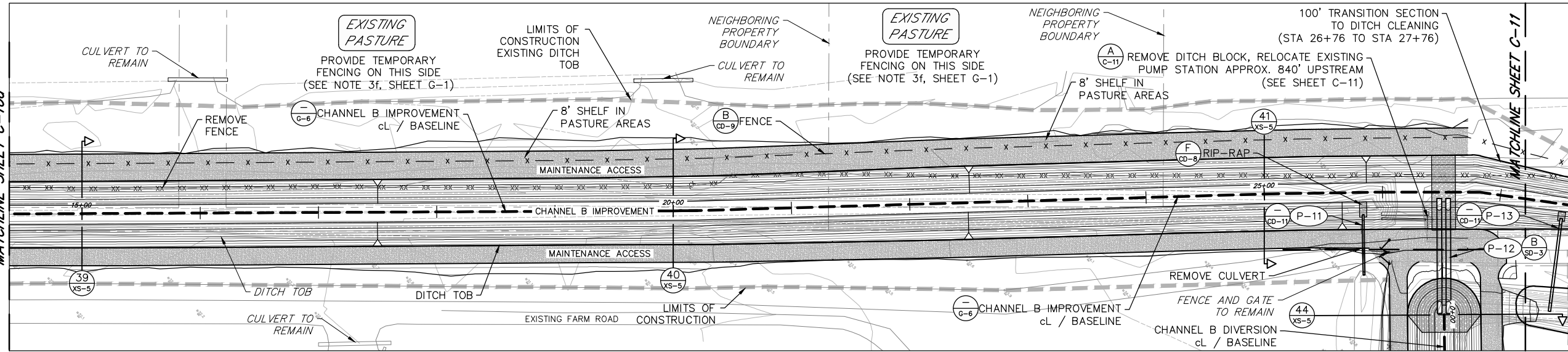
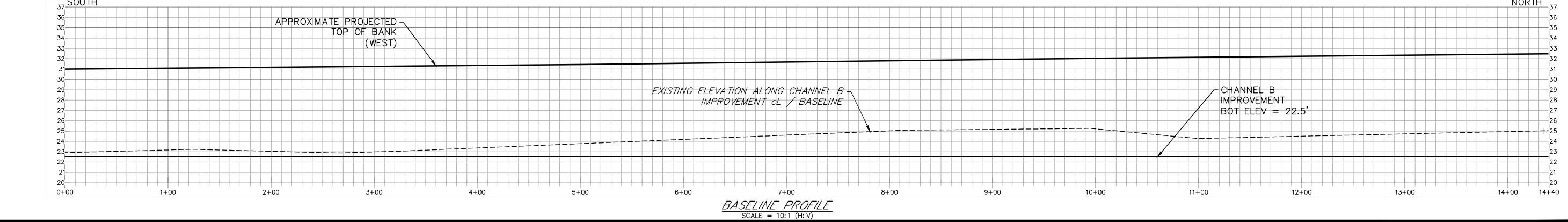
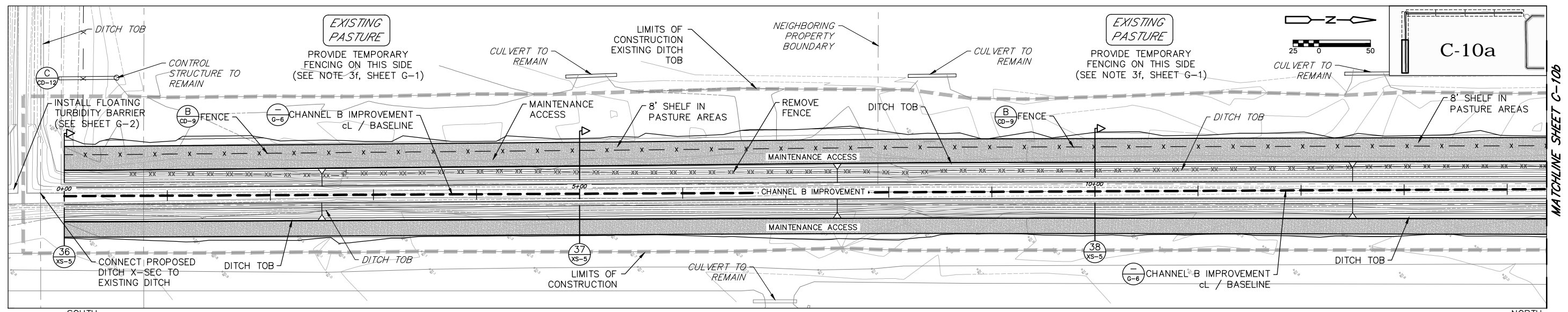


No.	Date

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 FLORIDA  
 HIGHLANDS COUNTY

CIVIL SITE PLAN  
 CHANNEL B IMPROVEMENT

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 Longwood, FL 32750  
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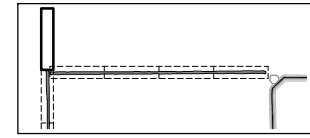
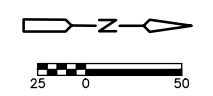
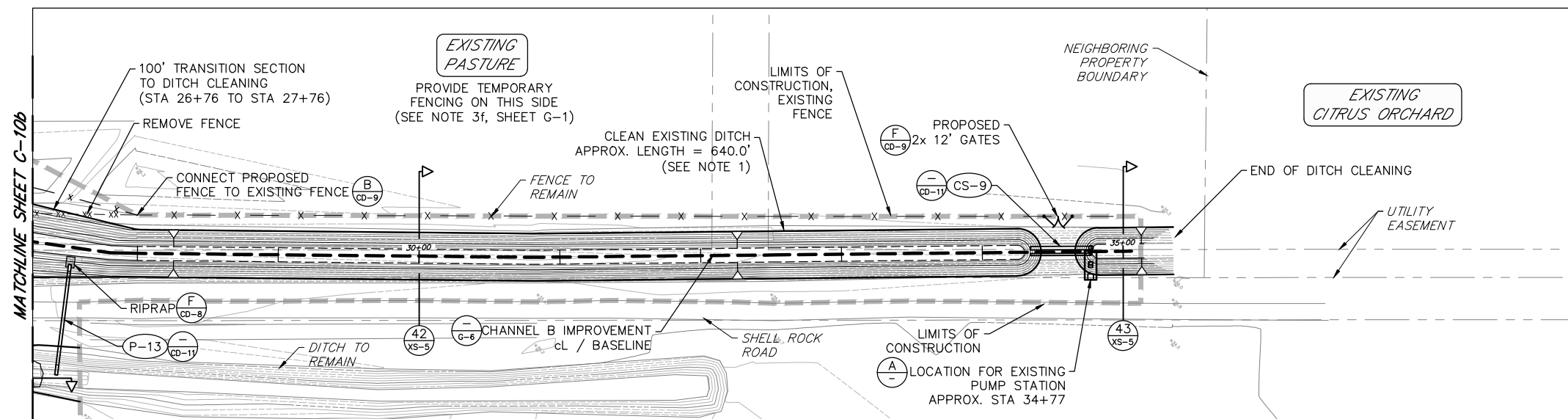
**C-10b**

**LEGEND**

- — — — — PROPERTY BOUNDARY
- - - - - LIMITS OF CONSTRUCTION
- - - - - CONSTRUCTION BASELINE
- - - - - EASEMENT
- x - x - x - EXISTING FENCE TO REMAIN
- x - x - x - EXISTING FENCE TO BE REMOVED
- x - x - x - PROPOSED FENCE

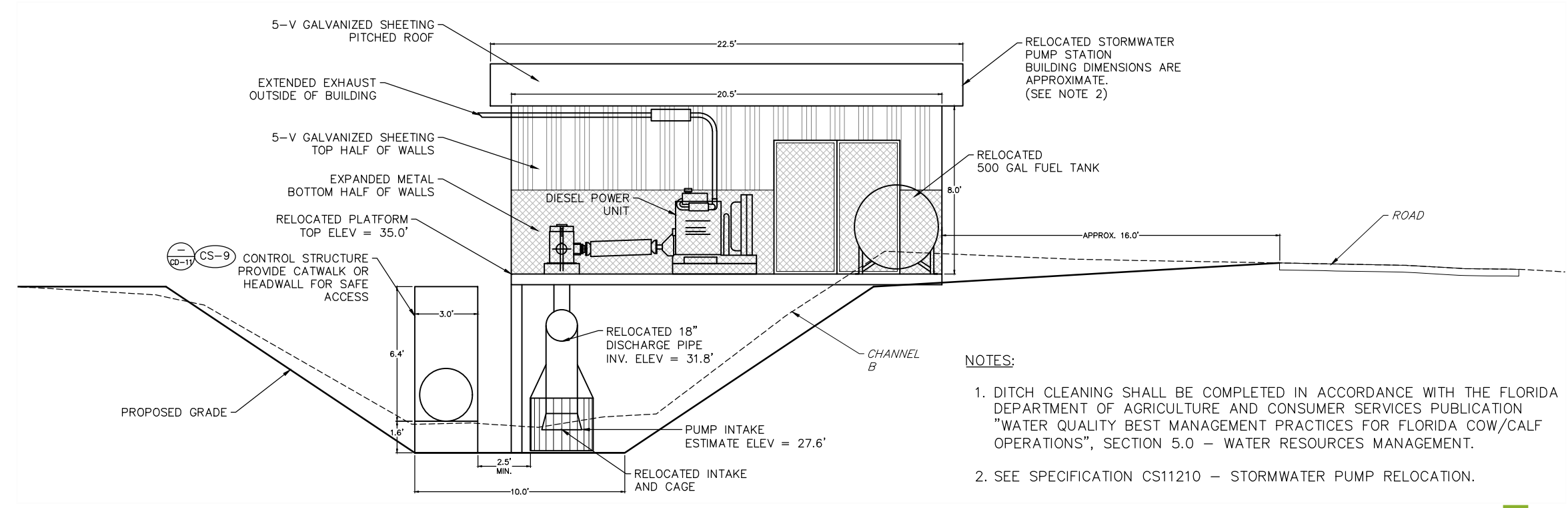
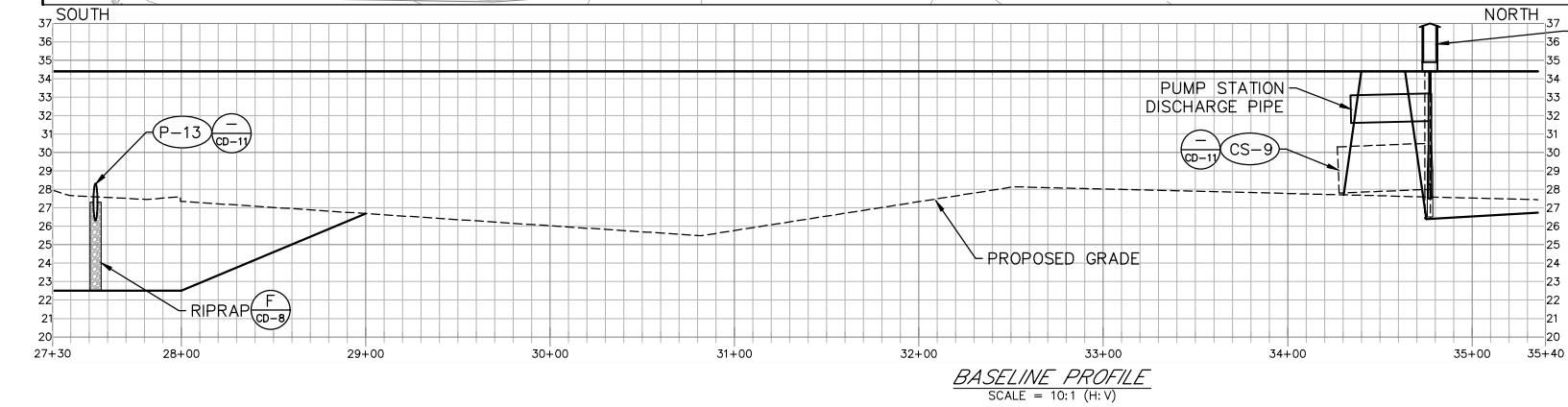
**For Review**  
 03/05/2018 4:27:48 PM





**LEGEND**

- PROPERTY BOUNDARY
- - - LIMITS OF CONSTRUCTION
- - - CONSTRUCTION BASELINE
- - - EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- xx - xx - xx - EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE



- NOTES:**
1. DITCH CLEANING SHALL BE COMPLETED IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES PUBLICATION "WATER QUALITY BEST MANAGEMENT PRACTICES FOR FLORIDA COW/CALF OPERATIONS", SECTION 5.0 - WATER RESOURCES MANAGEMENT.
  2. SEE SPECIFICATION CS11210 - STORMWATER PUMP RELOCATION.

(A) EXISTING PUMP STATION RELOCATION  
N.T.S.

Revision

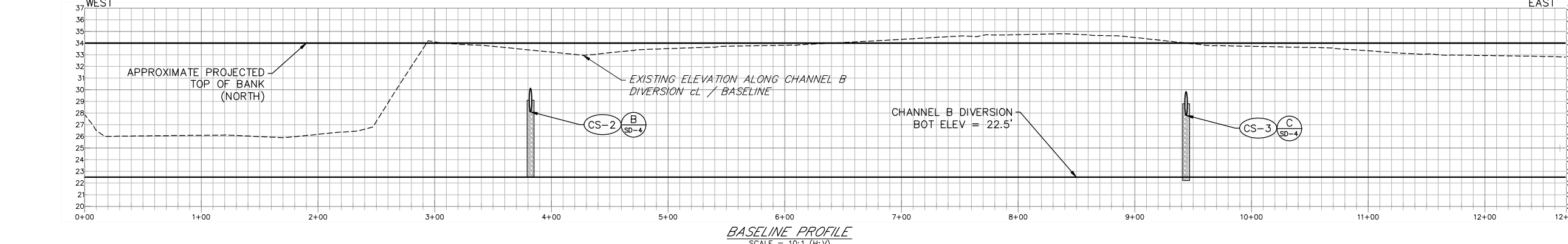
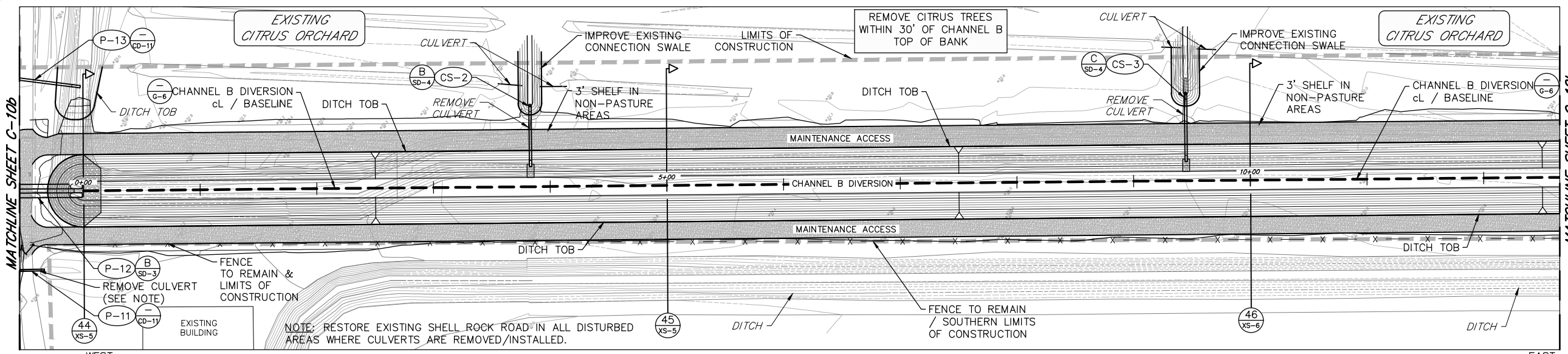
No.	Date

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

CIVIL SITE PLAN  
 CHANNEL B IMPROVEMENT

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 03/05/2018 4:27:56 PM

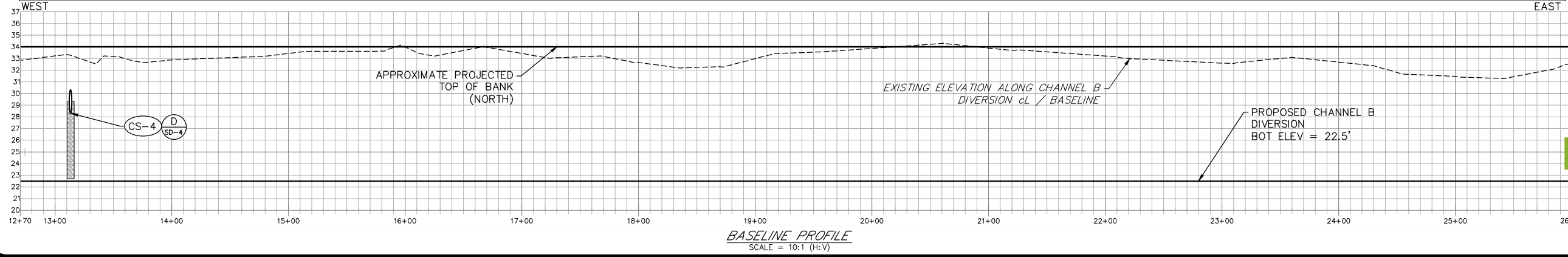
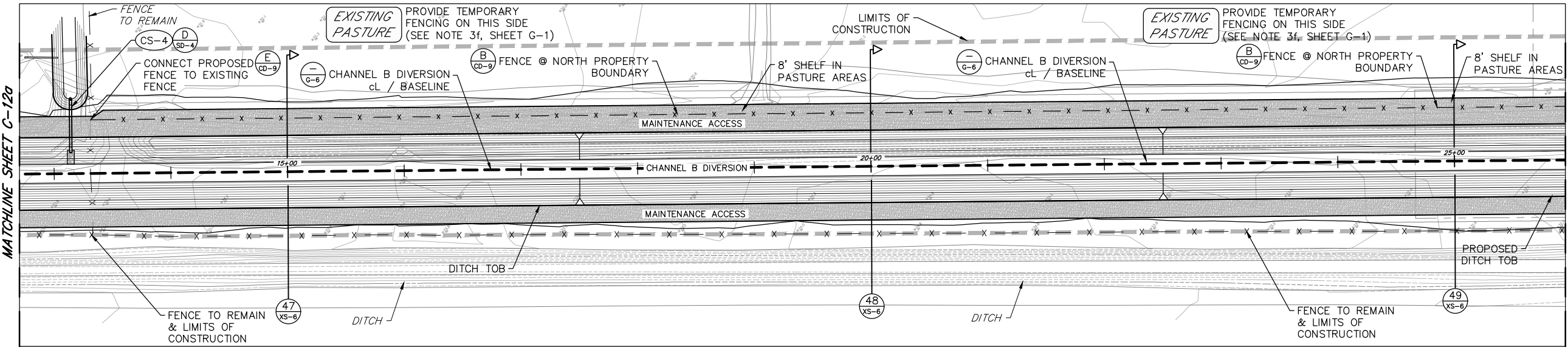


C-12a

**LEGEND**

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- - - 45+00 CONSTRUCTION BASELINE
- - - EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- xx - xx - xx - EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE

NOTE: CONTRACTOR SHALL RESTORE EXISTING SHELL ROCK ROADS WHERE IMPACTED BY CONSTRUCTION ACTIVITIES



C-12b

Job: 0202-02-ES  
 Scale: As Shown  
 Date: 3-5-2018  
 Design: R.A.J.  
 Drawn: J.J.D.  
 Checked: D.C.R.  
 Approved: B.L.R.

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPONDMENT DISTRICT  
 IMPONDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

CIVIL SITE PLAN  
 CHANNEL B DIVERSION

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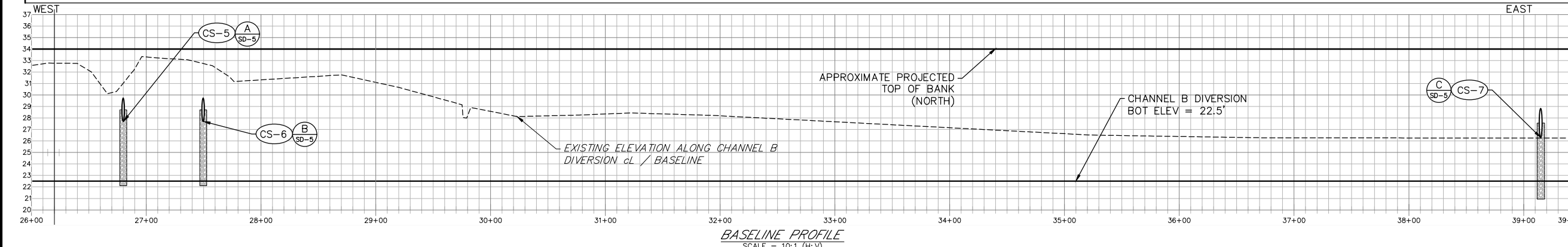
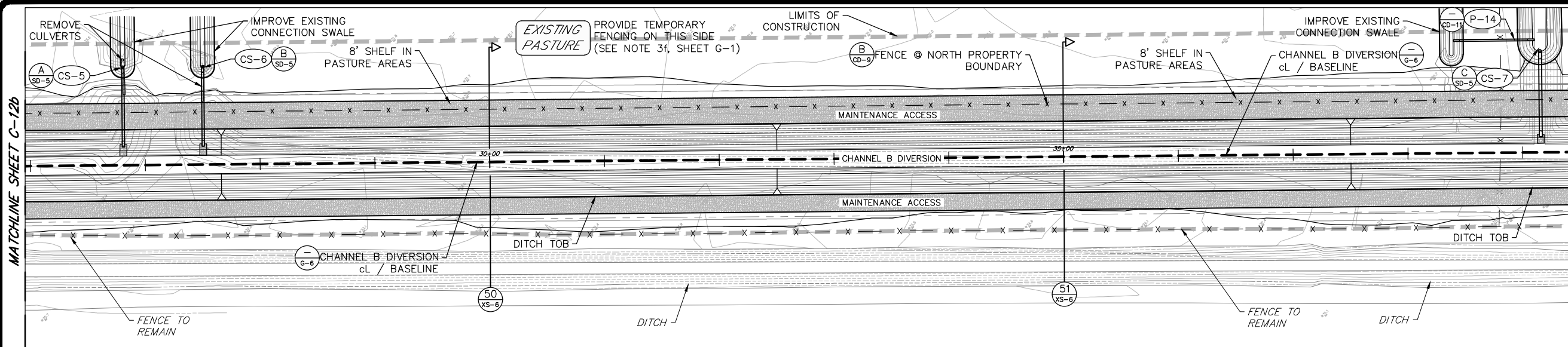
For Review

03/05/2018 4:28:04 PM

Richard A. Jones, P.E.  
 FL P.E. No. 31118

SHEET  
C-12





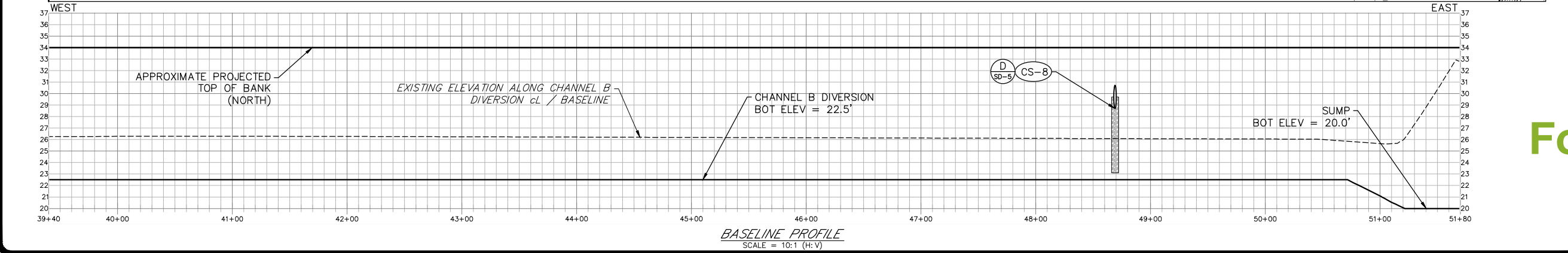
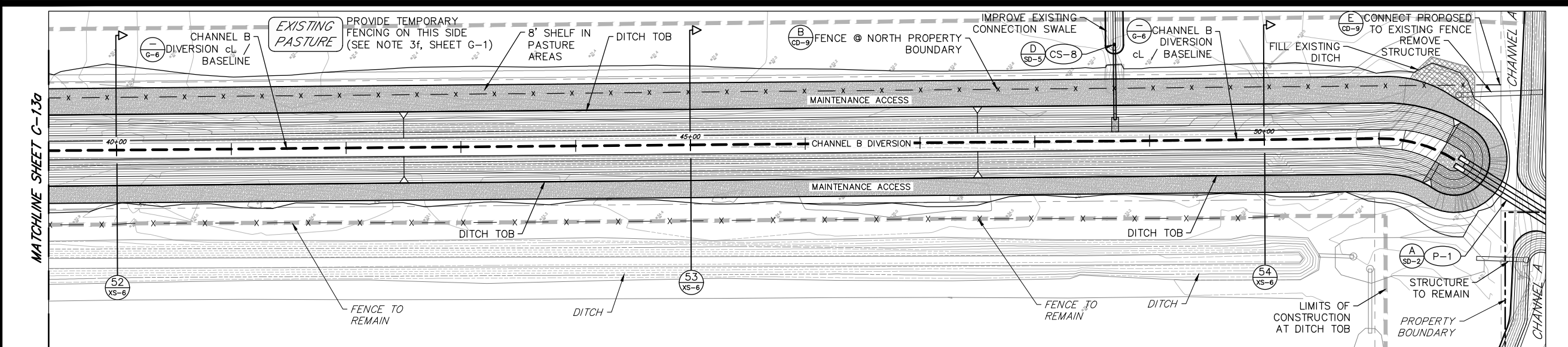
MATCHLINE SHEET C-12b

MATCHLINE SHEET C-13b

C-13a

**LEGEND**

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- 45+00 CONSTRUCTION BASELINE
- EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- x - x - x - EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE



MATCHLINE SHEET C-13a

MATCHLINE SHEET C-13b

C-13b

**LEGEND**

- PROPERTY BOUNDARY
- LIMITS OF CONSTRUCTION
- 45+00 CONSTRUCTION BASELINE
- EASEMENT
- x - x - EXISTING FENCE TO REMAIN
- x - x - x - EXISTING FENCE TO BE REMOVED
- x - x - PROPOSED FENCE

Job: 0202-02-ES  
 Scale: As Shown  
 Date: 3-5-2018  
 Design: R.A.J.  
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No. Date:

HIGHLANDS COUNTY BCC  
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**For Review**  
 03/05/2018 4:28:14 PM

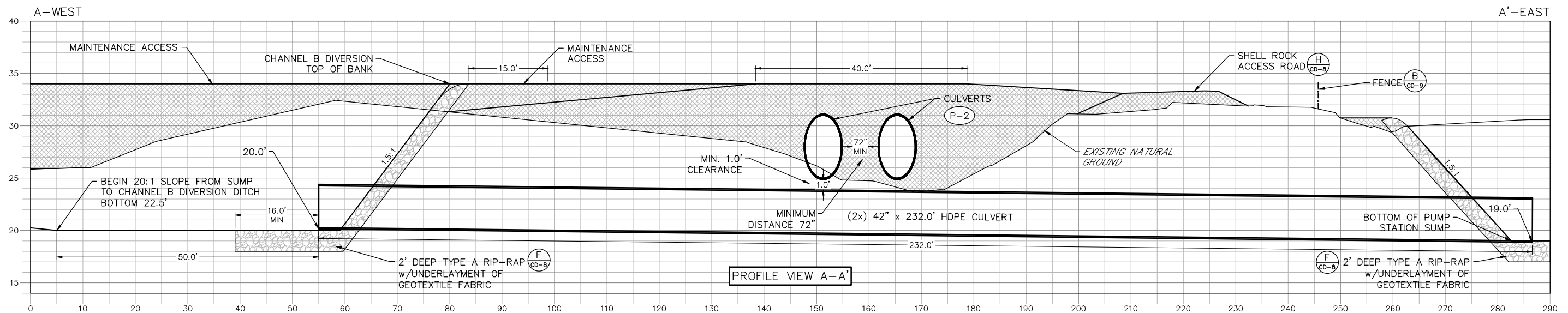
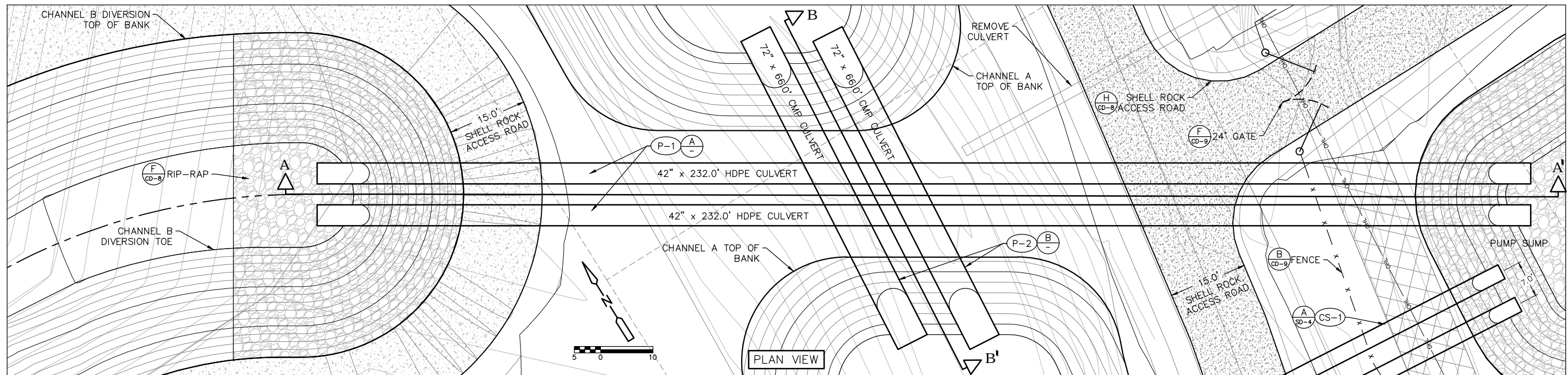
SHEET  
 C-13

Richard A. Jones, P.E.  
 FL P.E. No. 31118

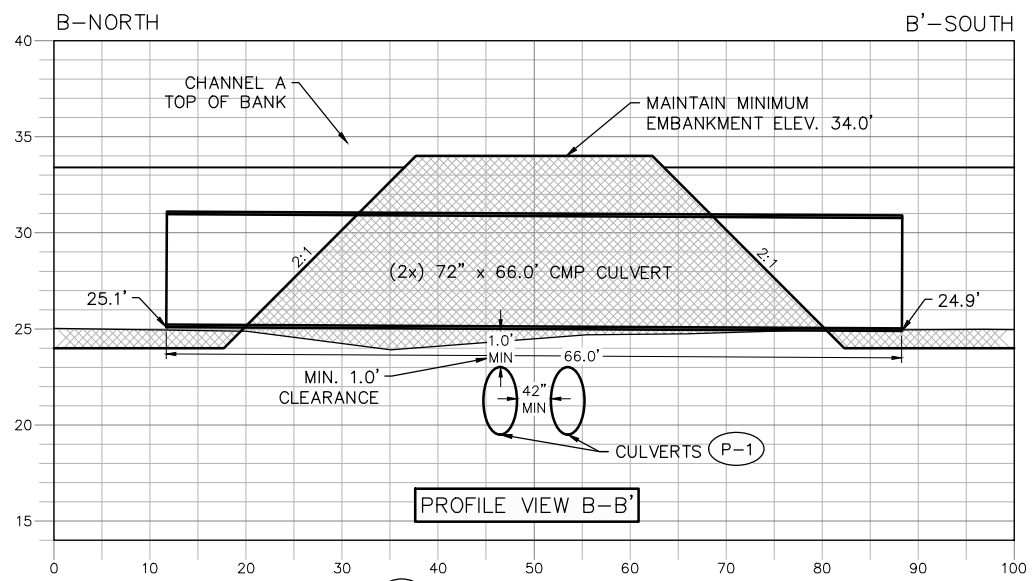








(A) CULVERT P-1  
 C-1 SCALE = 2:1 (H:V)



(B) CULVERT P-2  
 C-1 SCALE = 2:1 (H:V)

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPONDMENT DISTRICT  
 IMPONDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

SITE DETAIL  
 CULVERTS AND  
 CONTROL STRUCTURES

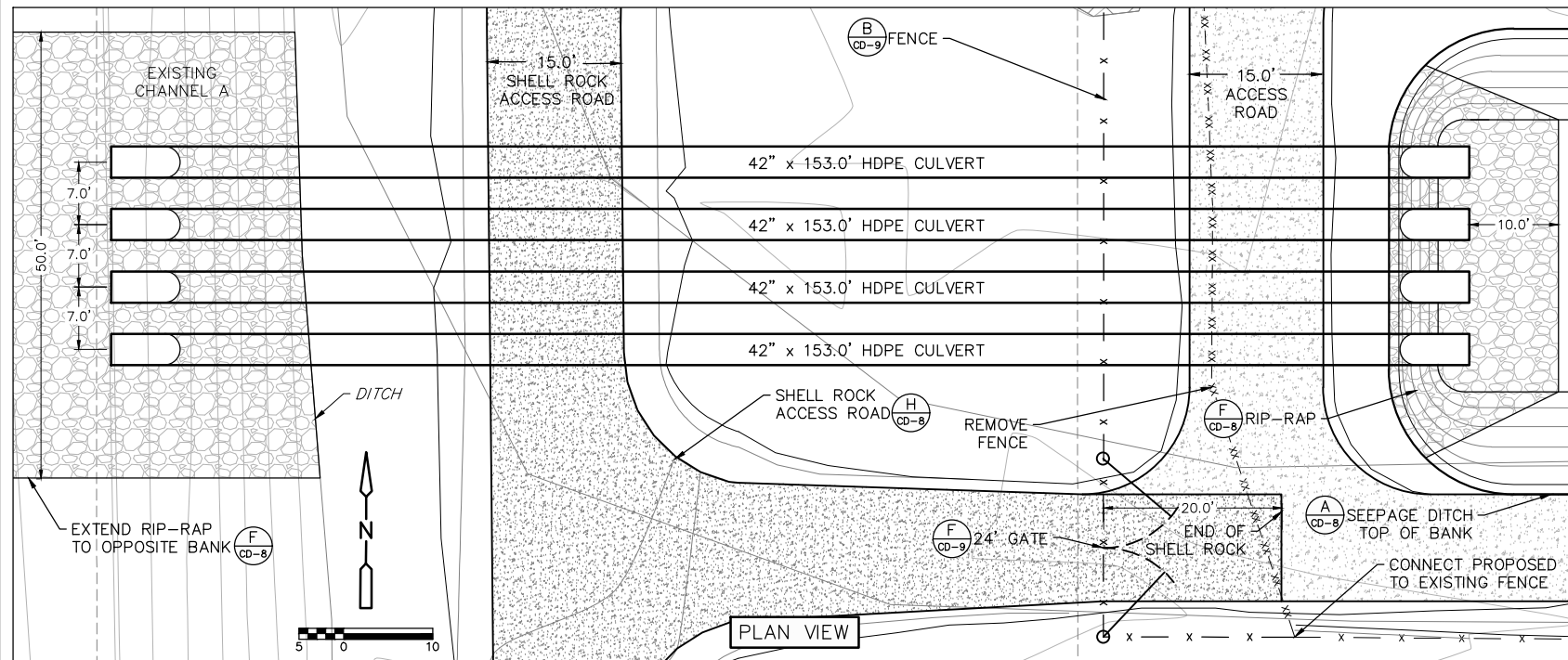
Royal Consulting Services, Inc.  
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 03/05/2018 4:28:29 PM

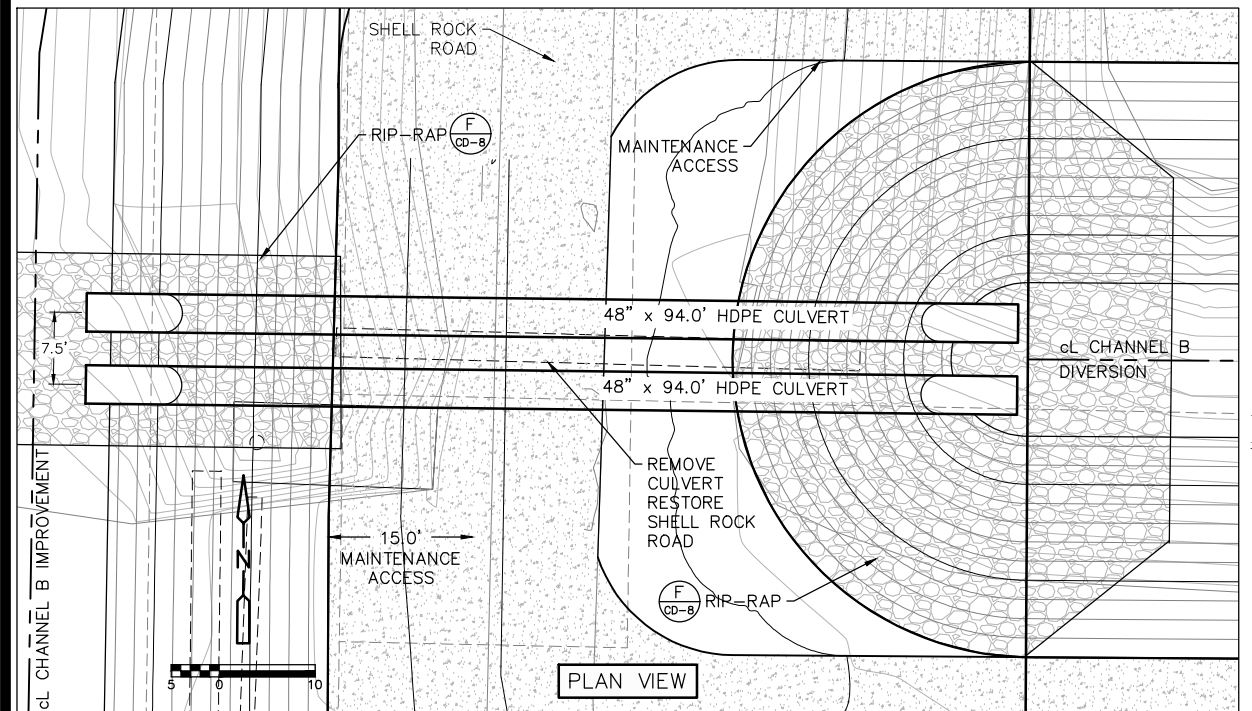
Richard A. Jones, P.E.  
 FL P.E. No. 31118

SHEET  
 SD-2

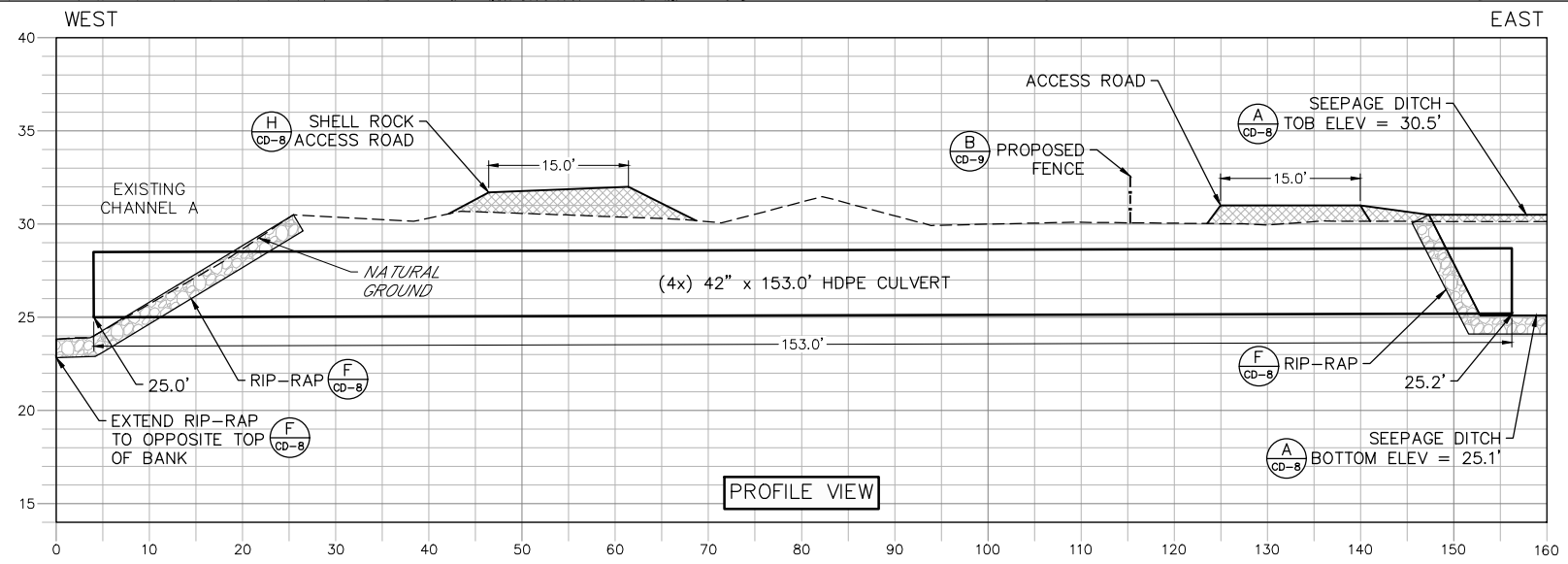




PLAN VIEW

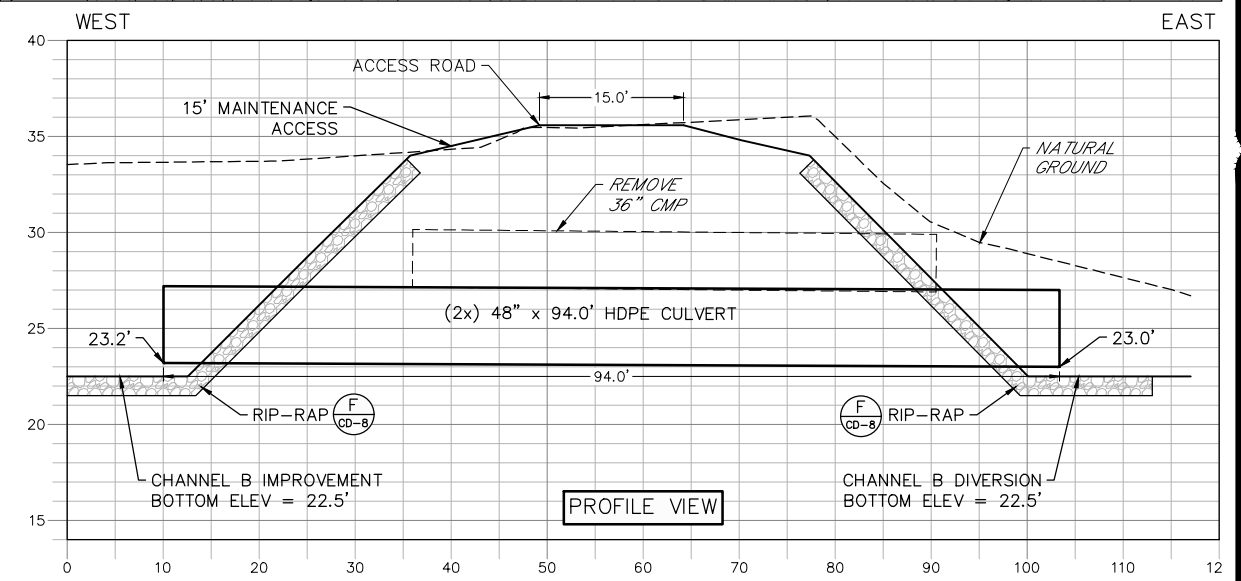


PLAN VIEW



PROFILE VIEW

A CULVERT P-8  
 C-7B SCALE = 2:1 (H:V)



PROFILE VIEW

B CULVERT P-12  
 C-12A SCALE = 2:1 (H:V)

Revision  
 No. Date  
 HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPROVEMENT DISTRICT  
 IMPROVEMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

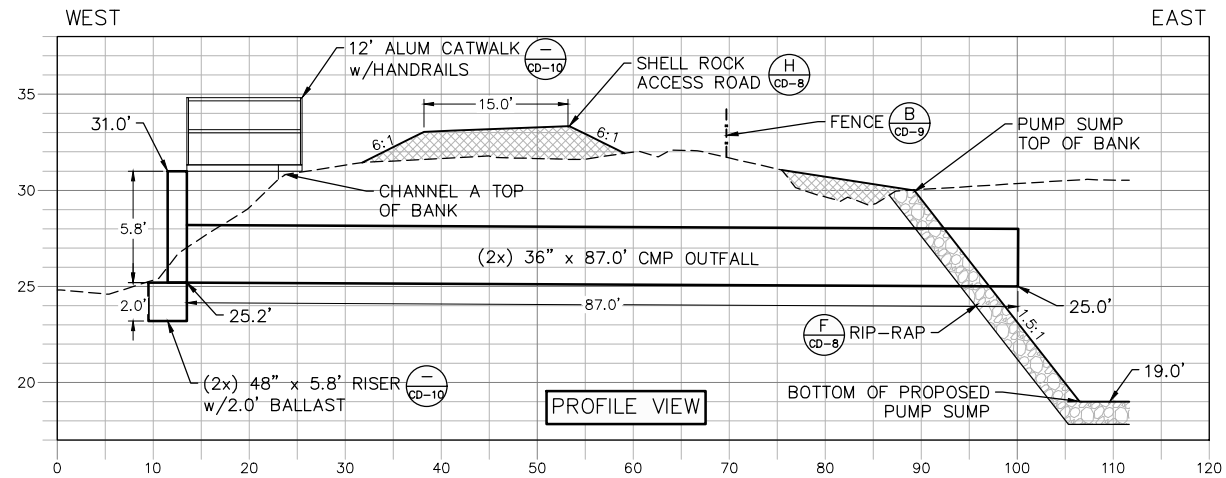
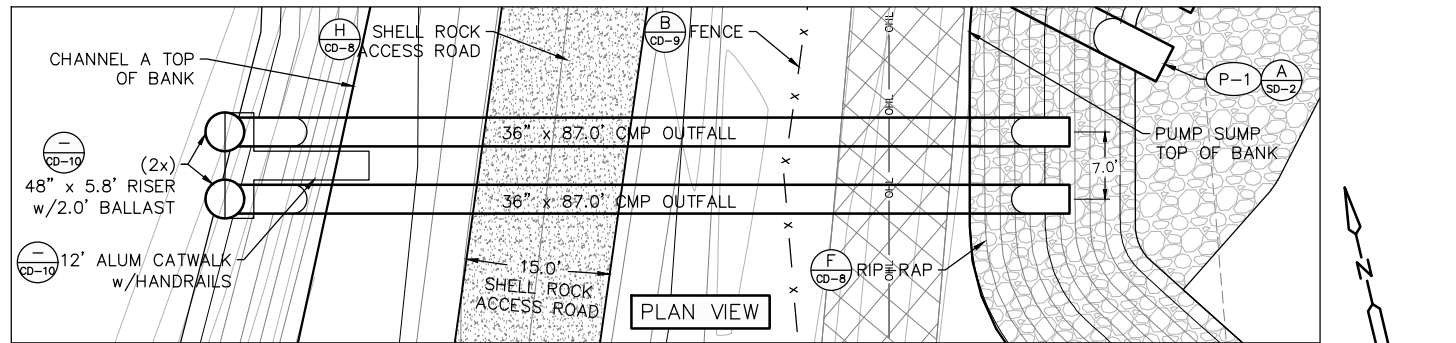
SITE DETAIL  
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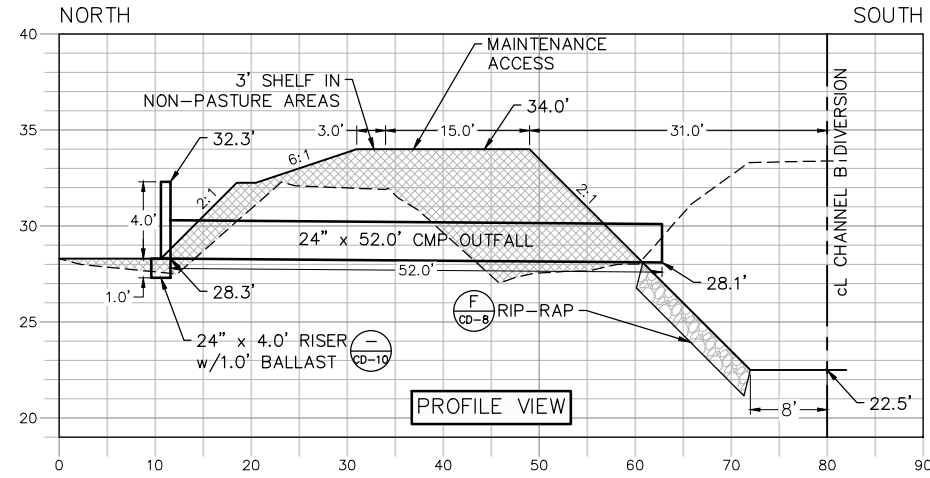
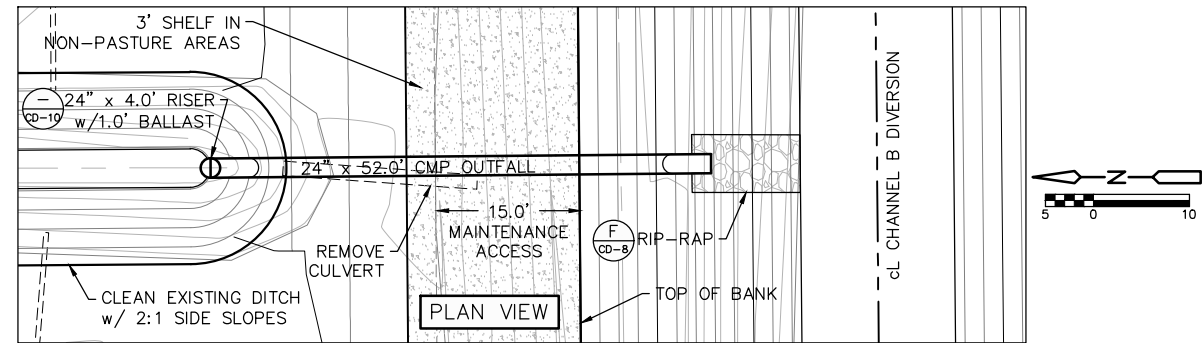
**For Review**  
 03/05/2018 4:28:35 PM

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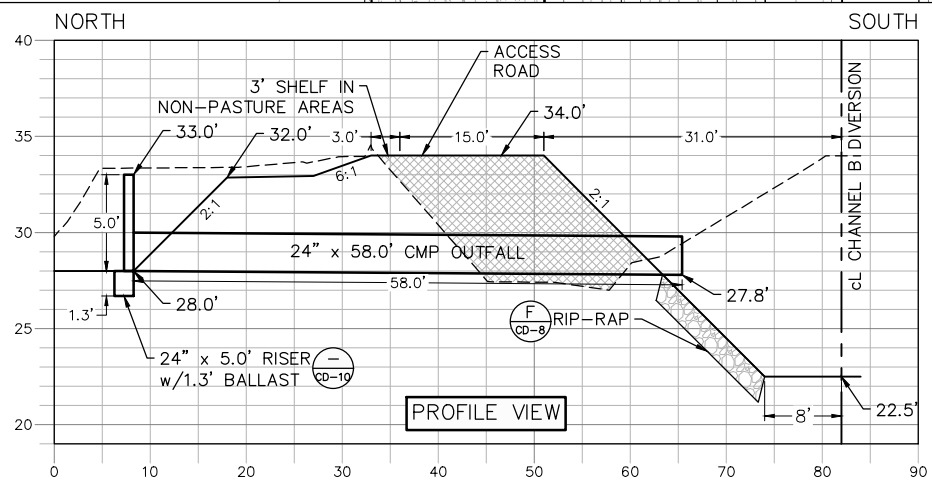
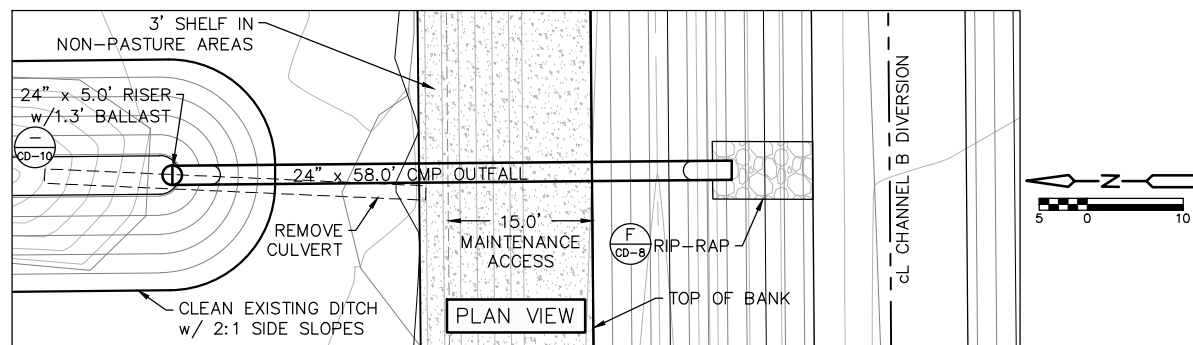
SHEET  
 SD-3



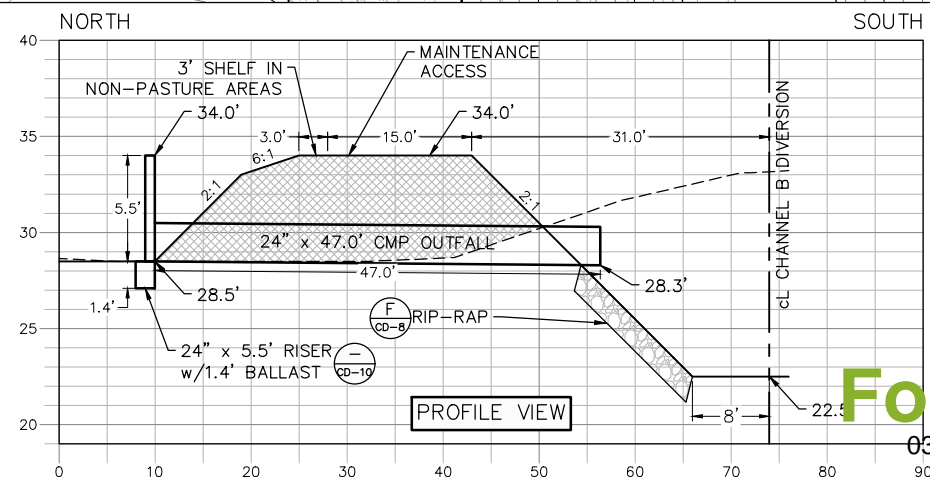
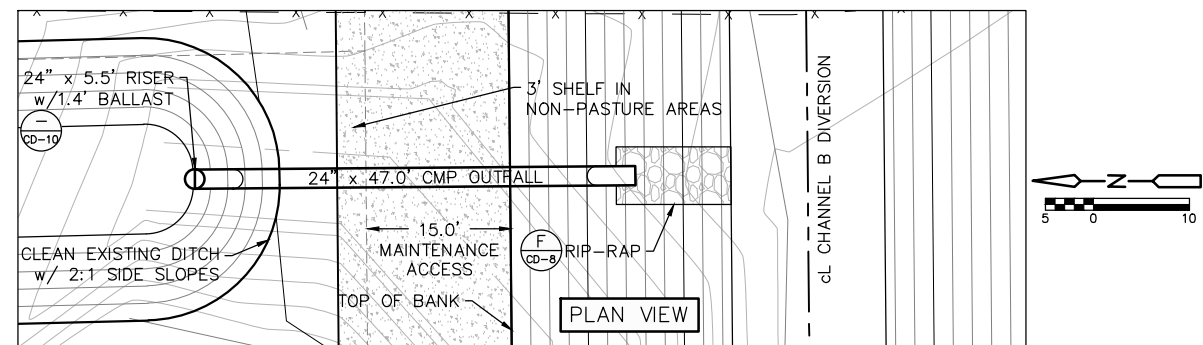
**A** CONTROL STRUCTURE CS-1  
 C-1 SCALE = 2:1 (H:V)



**B** CONTROL STRUCTURE CS-2  
 C-12A SCALE = 2:1 (H:V)



**C** CONTROL STRUCTURE CS-3  
 C-12A SCALE = 2:1 (H:V)



**D** CONTROL STRUCTURE CS-4  
 C-12B SCALE = 2:1 (H:V)

Revision

No. Date:

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPONDMENT DISTRICT  
 IMPONDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

SITE DETAIL  
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 CONTROL STRUCTURES

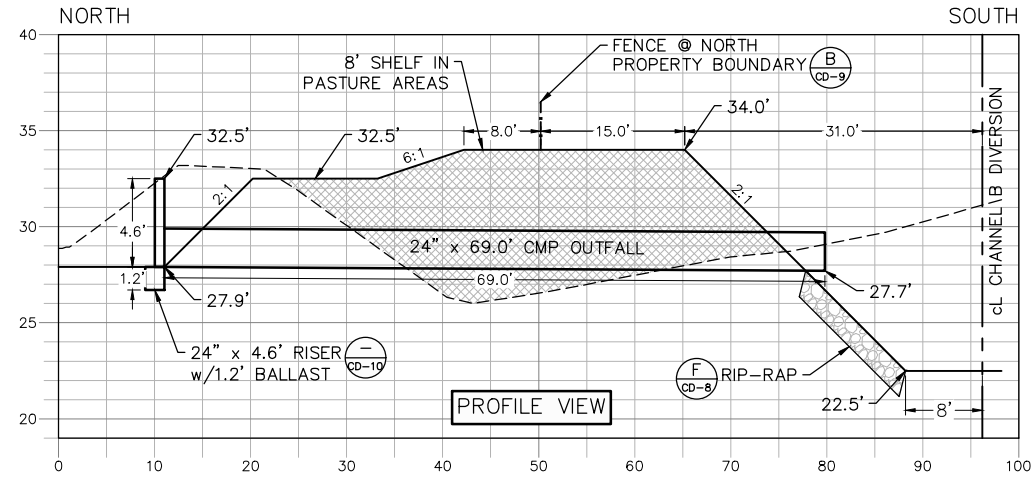
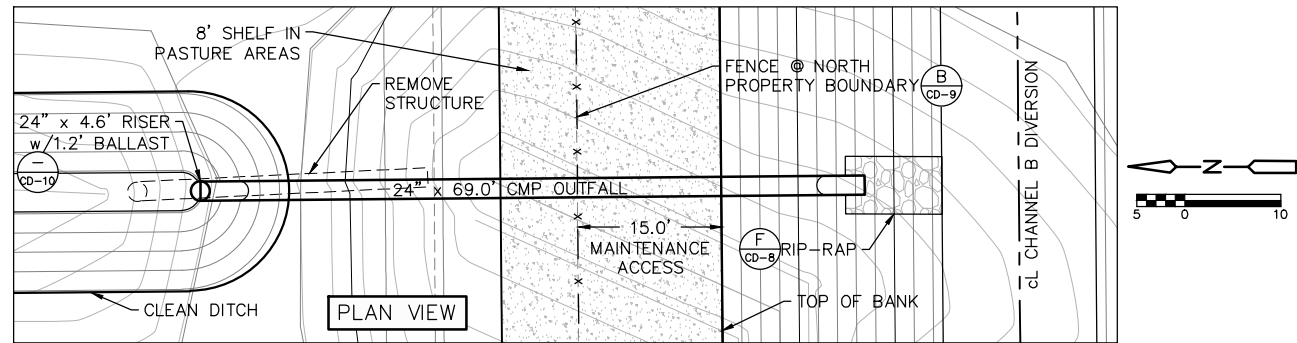
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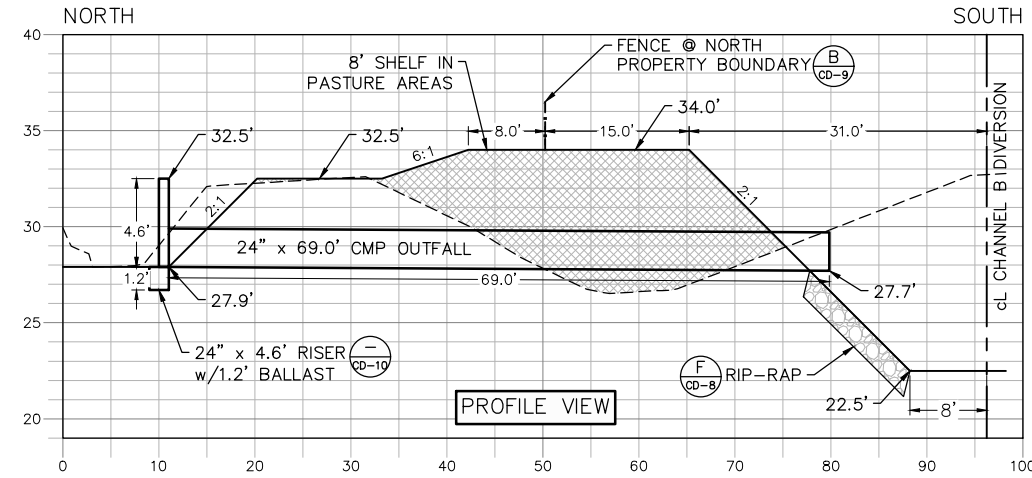
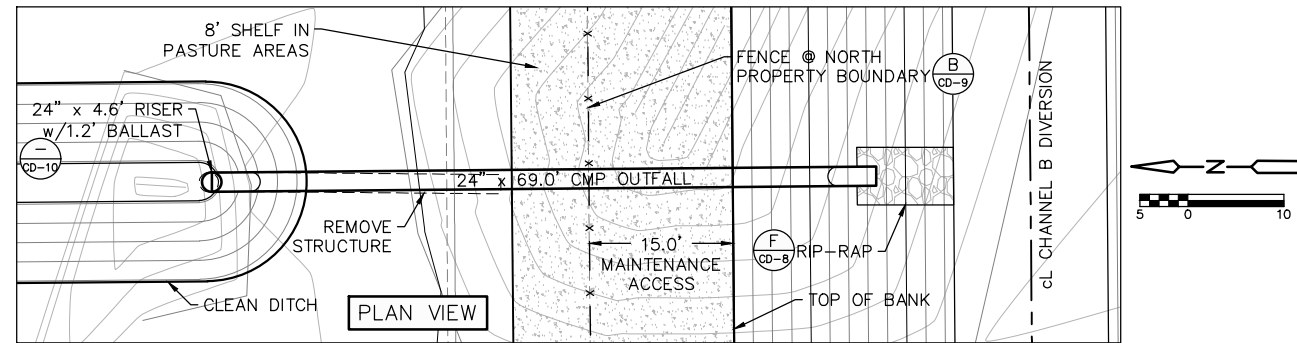
Richard A. Jones, P.E.  
 FL P.E. No. 31118

SHEET  
 SD-4

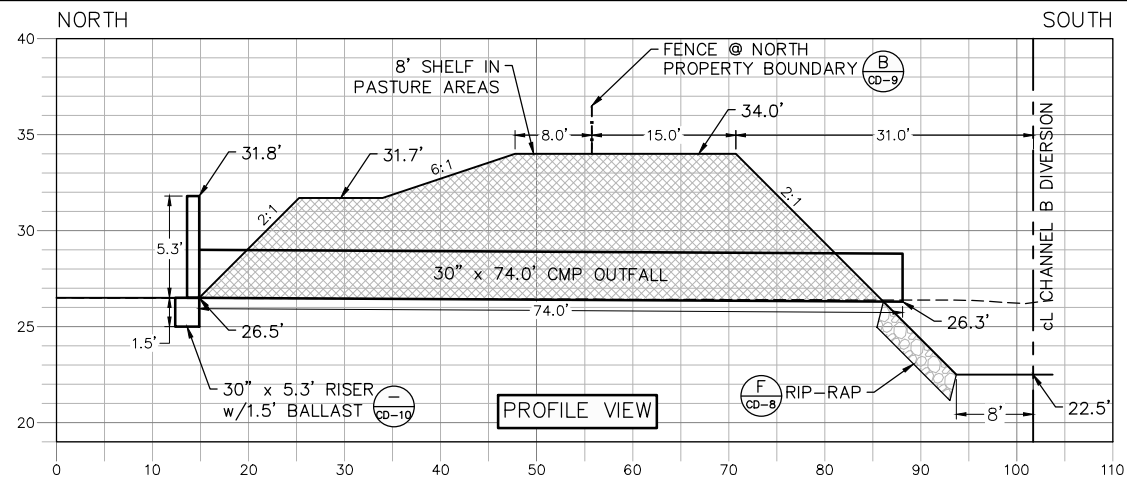
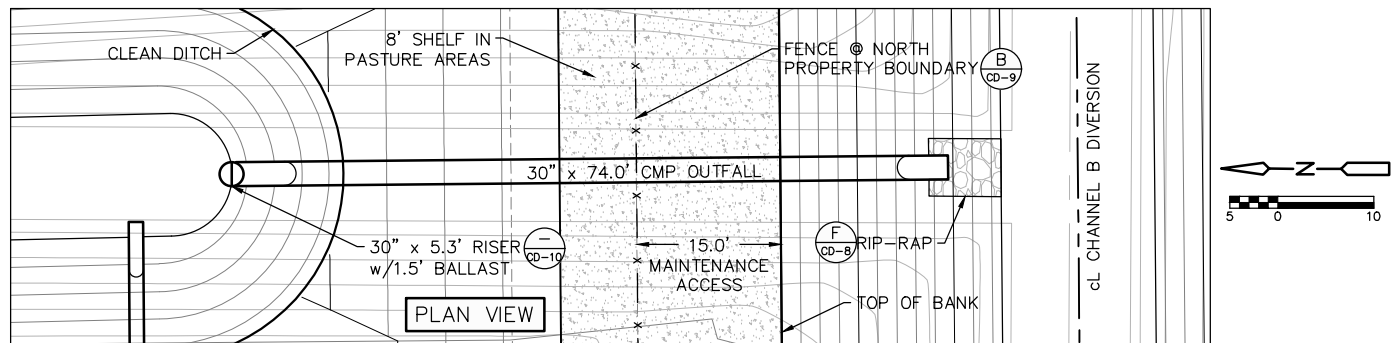




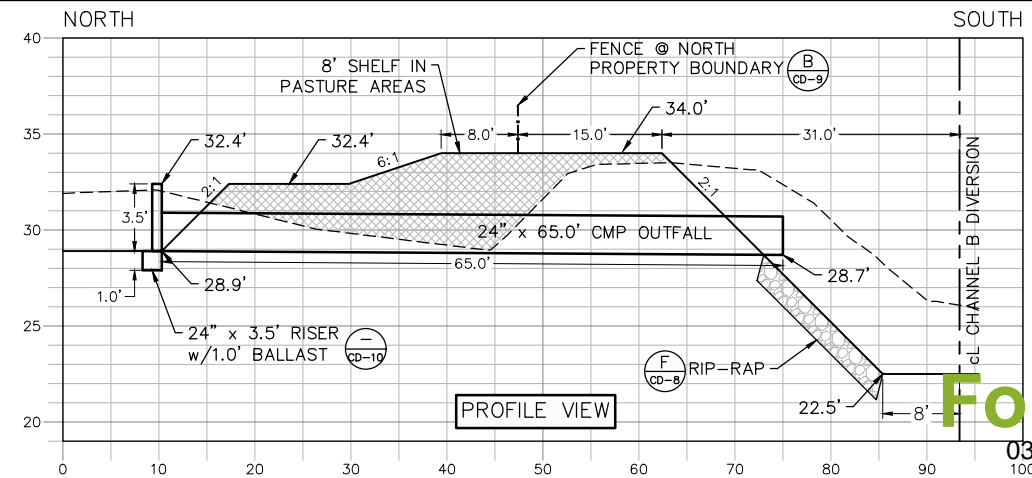
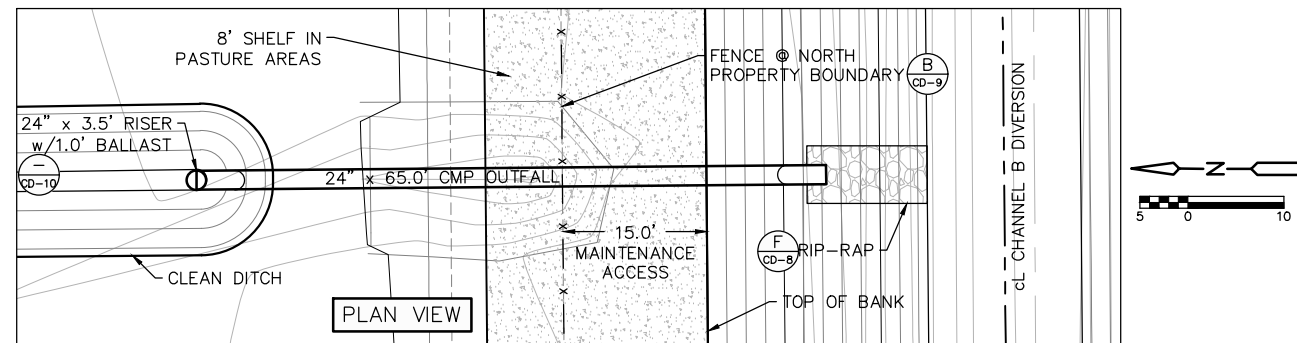
**A** CONTROL STRUCTURE CS-5  
 C-13A SCALE = 2:1 (H:V)



**B** CONTROL STRUCTURE CS-6  
 C-13A SCALE = 2:1 (H:V)



**C** CONTROL STRUCTURE CS-7  
 C-13A SCALE = 2:1 (H:V)



**D** CONTROL STRUCTURE CS-8  
 C-13B SCALE = 2:1 (H:V)

Revision

No. Date

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPONDMENT DISTRICT  
 IMPONDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

SITE DETAIL  
 CULVERTS AND  
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For Review

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Richard A. Jones, P.E.  
 FL P.E. No. 31118

SHEET  
 SD-5



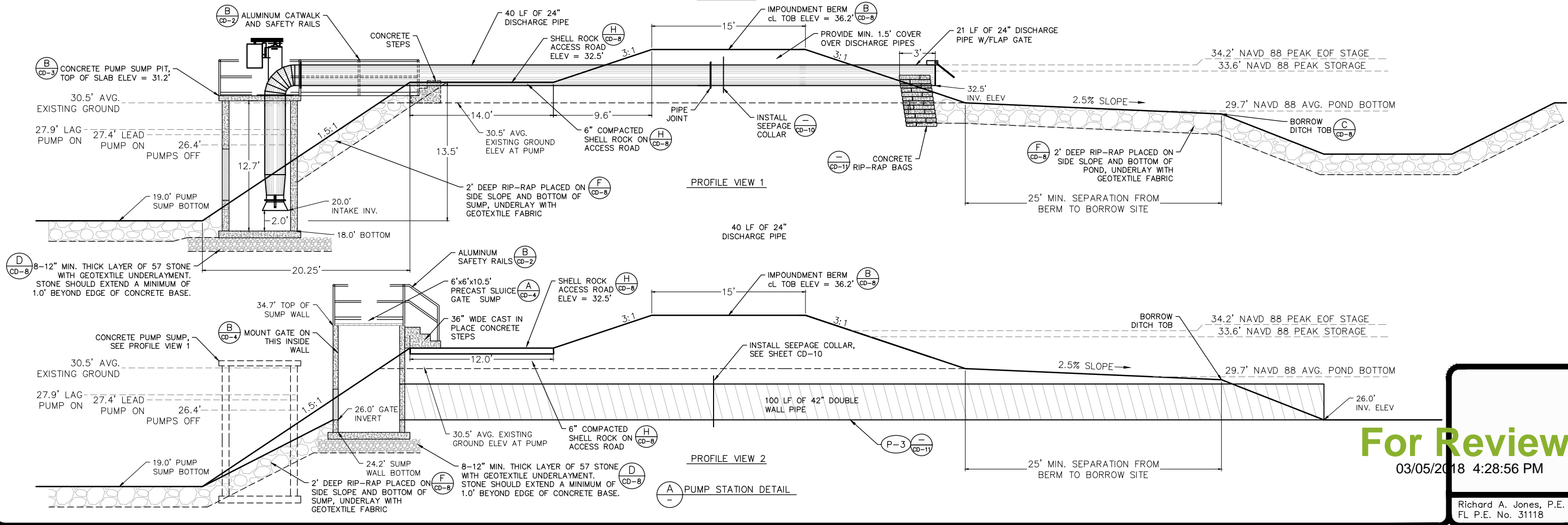
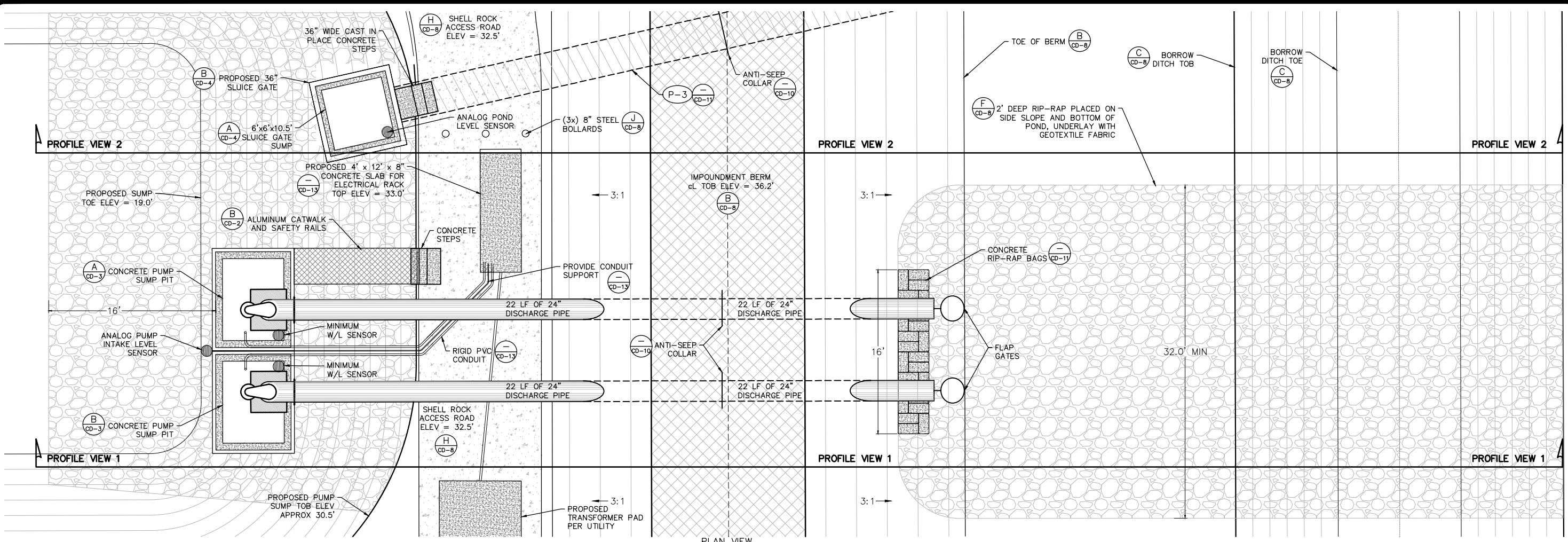
No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPONDMENT DISTRICT  
 IMPONDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

PUMP STATION DETAILS

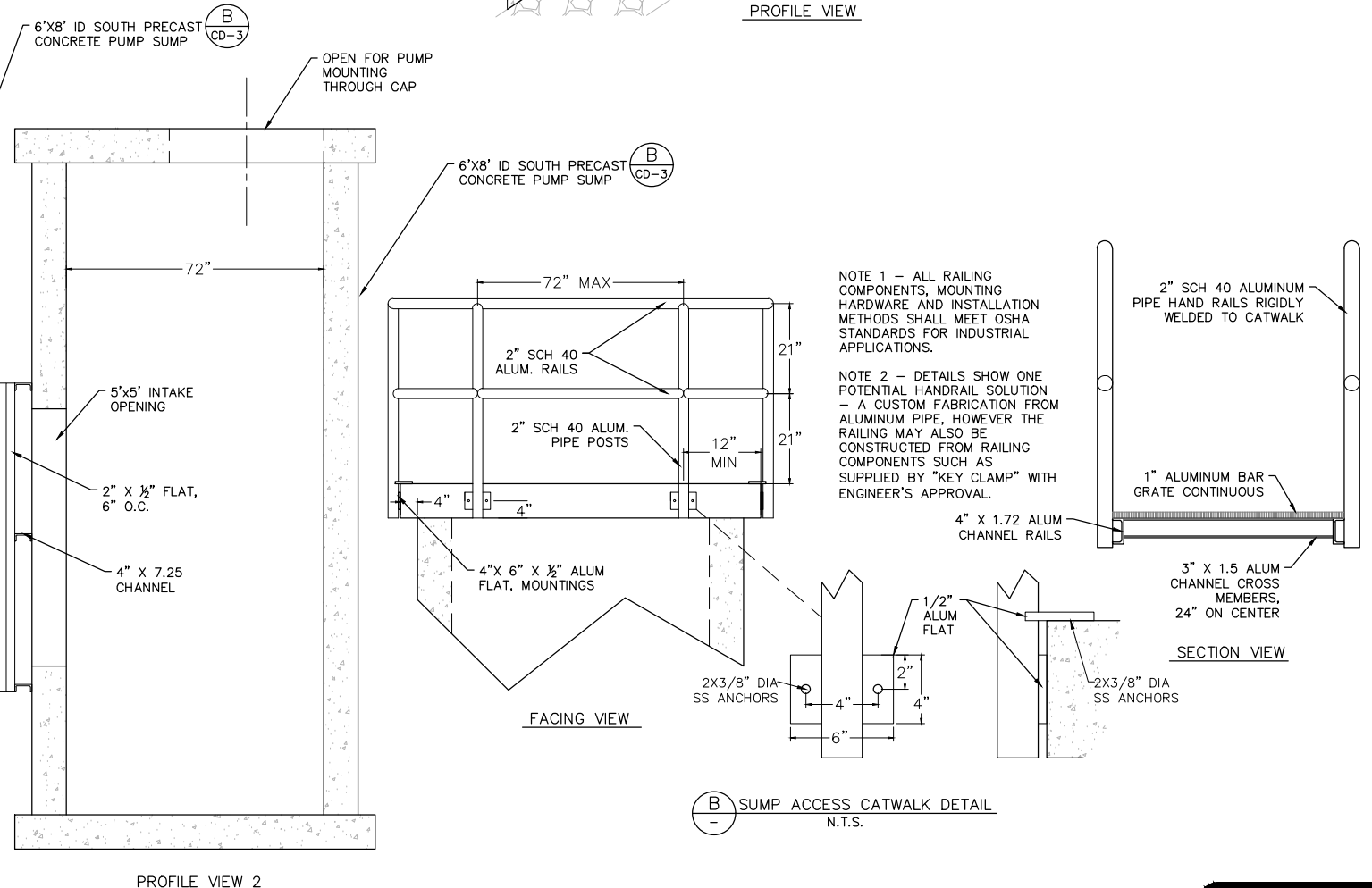
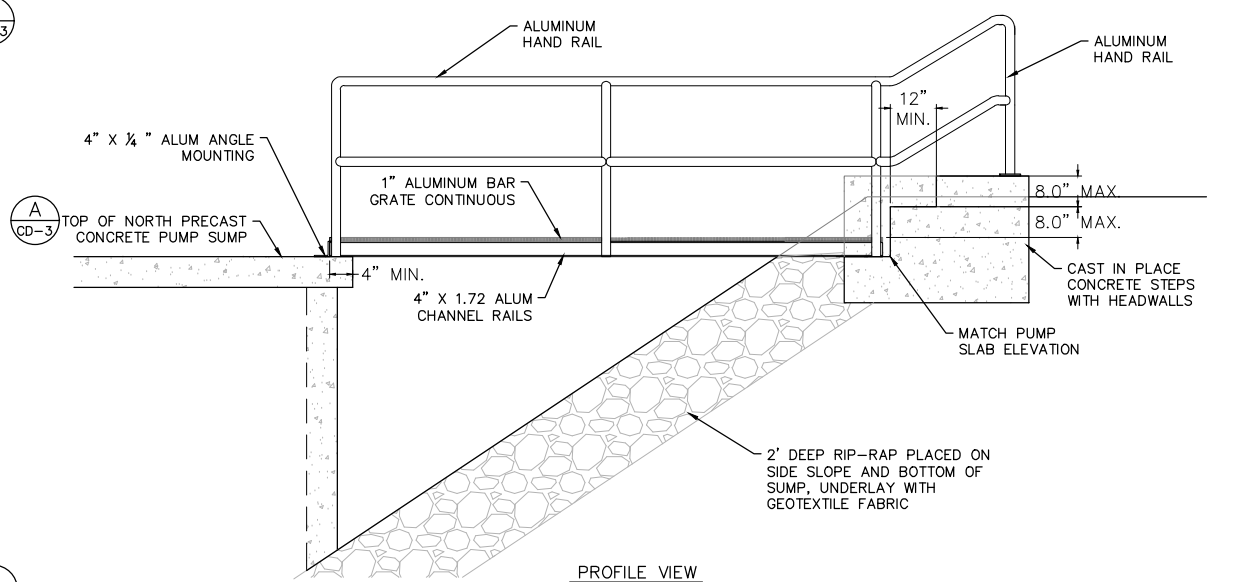
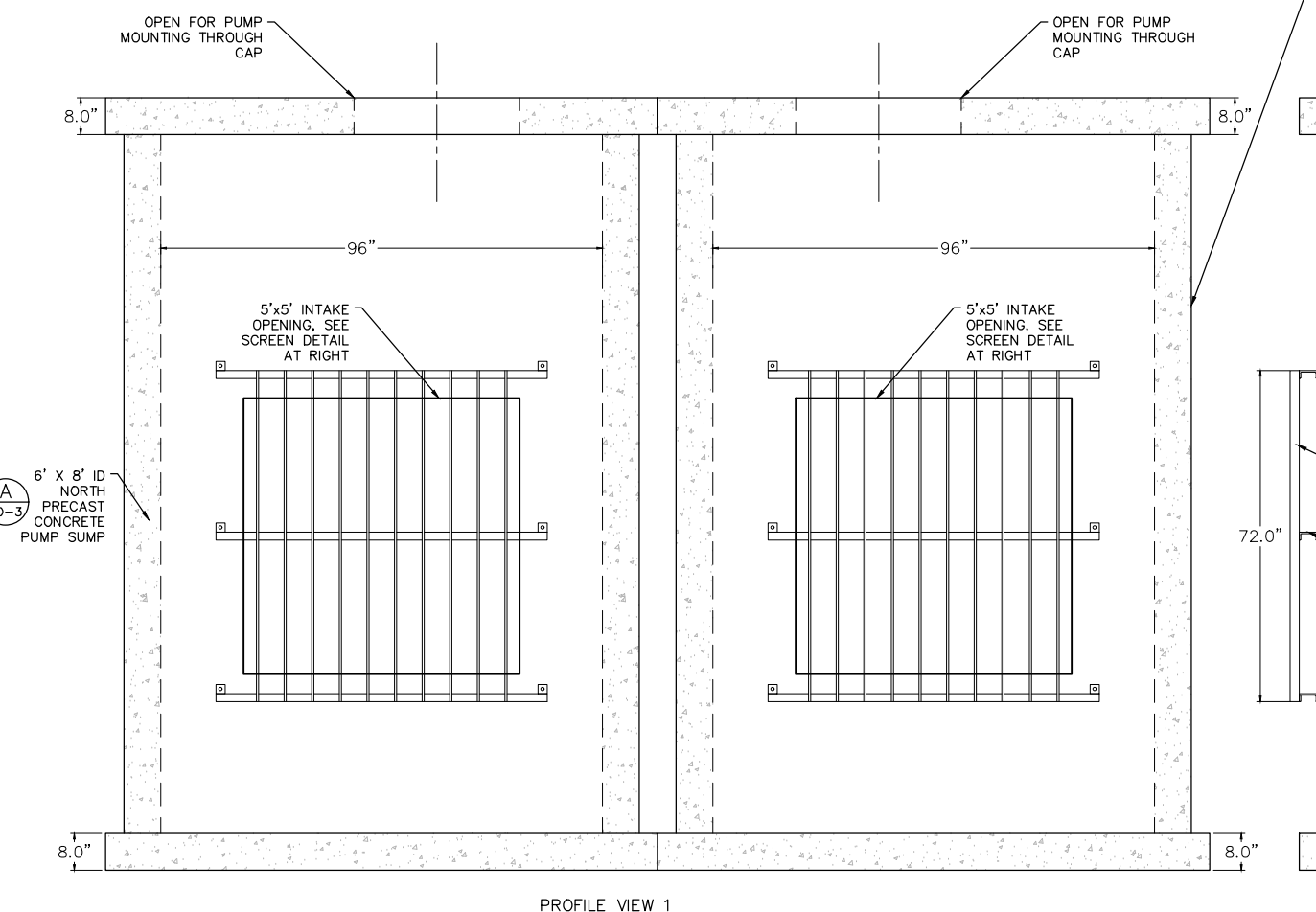
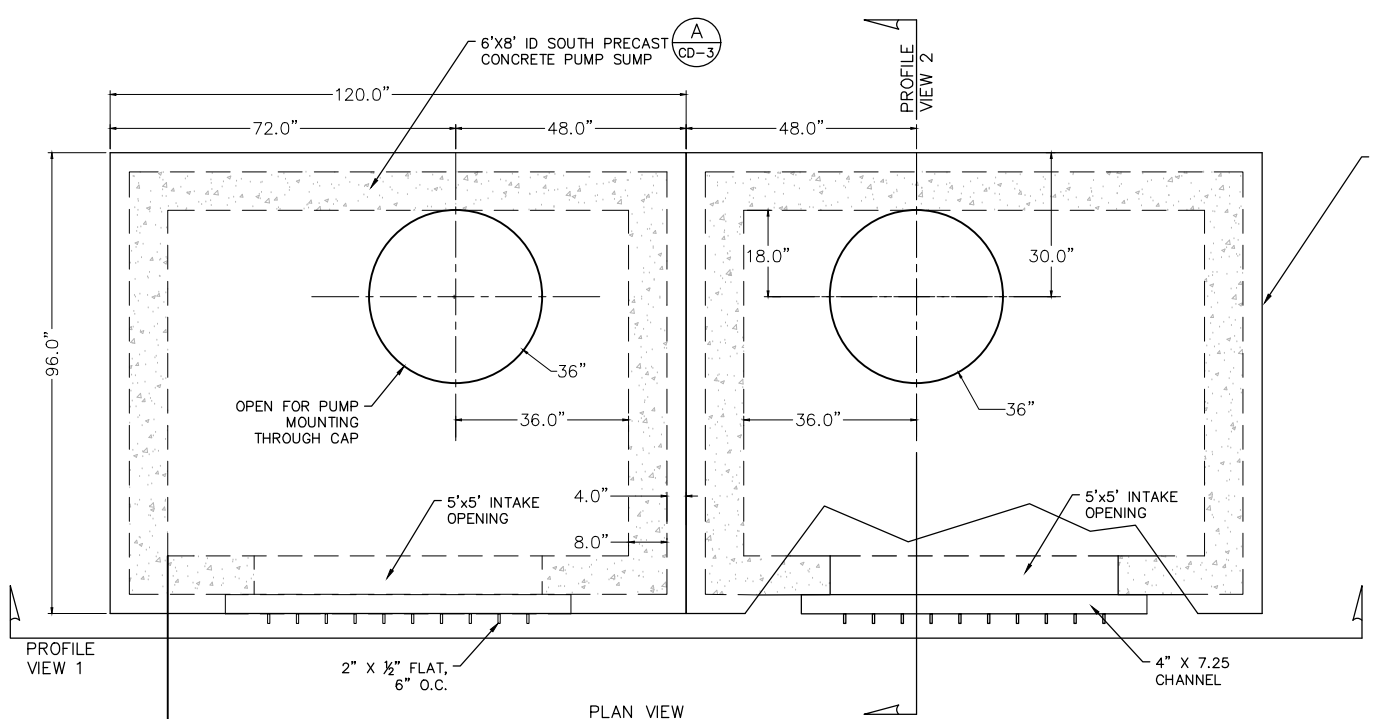
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SHEET  
 CD-1



**For Review**  
 03/05/2018 4:28:56 PM

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NOTE 1 - ALL RAILING COMPONENTS, MOUNTING METHODS SHALL MEET OSHA STANDARDS FOR INDUSTRIAL APPLICATIONS.

NOTE 2 - DETAILS SHOW ONE POTENTIAL HANDRAIL SOLUTION - A CUSTOM FABRICATION FROM ALUMINUM PIPE, HOWEVER THE RAILING MAY ALSO BE CONSTRUCTED FROM RAILING COMPONENTS SUCH AS SUPPLIED BY "KEY CLAMP" WITH ENGINEER'S APPROVAL.

(B) SUMP ACCESS CATWALK DETAIL  
 N.T.S.

NOTE 1 - DIMENSIONS FOR PUMP SUMP SHALL BE REVIEWED AND APPROVED BY PUMP SUPPLIER TO FIT THE REQUIREMENTS OF THE PUMPS TO BE INSTALLED.

NOTE 2 - PRECAST CONCRETE MANUFACTURER SHALL VERIFY STRUCTURAL DESIGN FOR PUMP SUMP, FOUNDATION AND CAPS.

NOTE 3 - INTAKE SCREEN DESIGN SHALL BE APPROVED BY PUMP MANUFACTURER AND HOT DIP GALVANIZED AFTER FABRICATION.

(A) CONCRETE SUMP DETAIL  
 N.T.S.

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPONDMENT DISTRICT  
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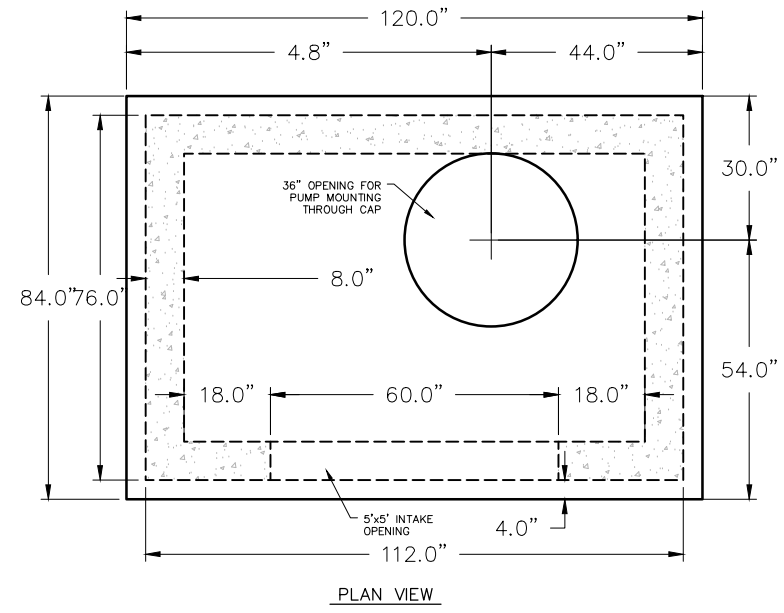
PUMP STATION DETAILS

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 (407) 831-5095 fax  
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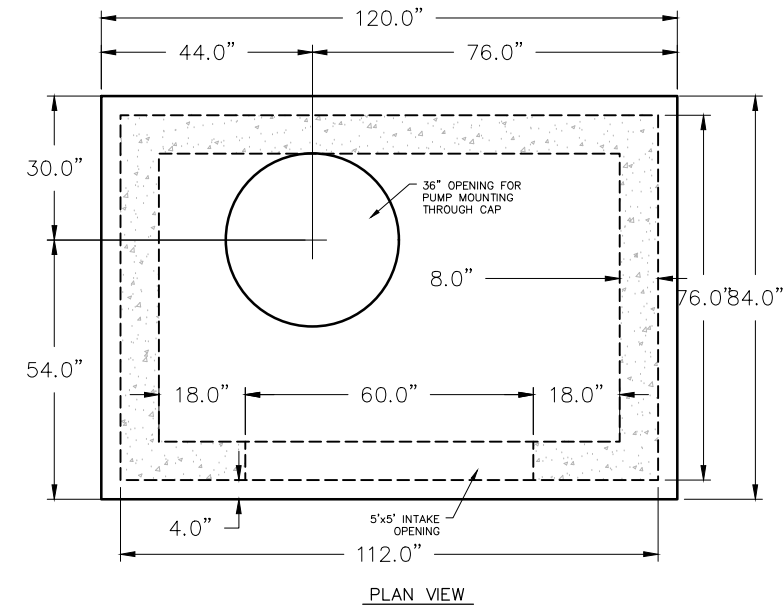
**For Review**  
 03/05/2018 4:29:02 PM

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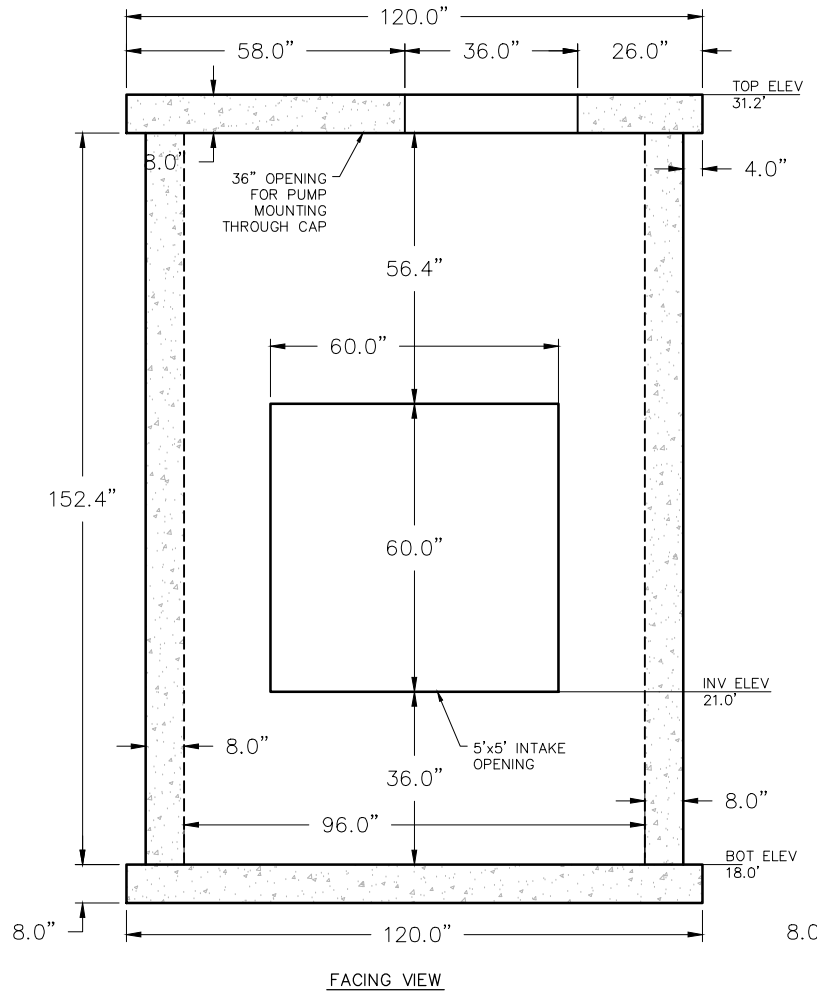
SHEET  
 CD-2



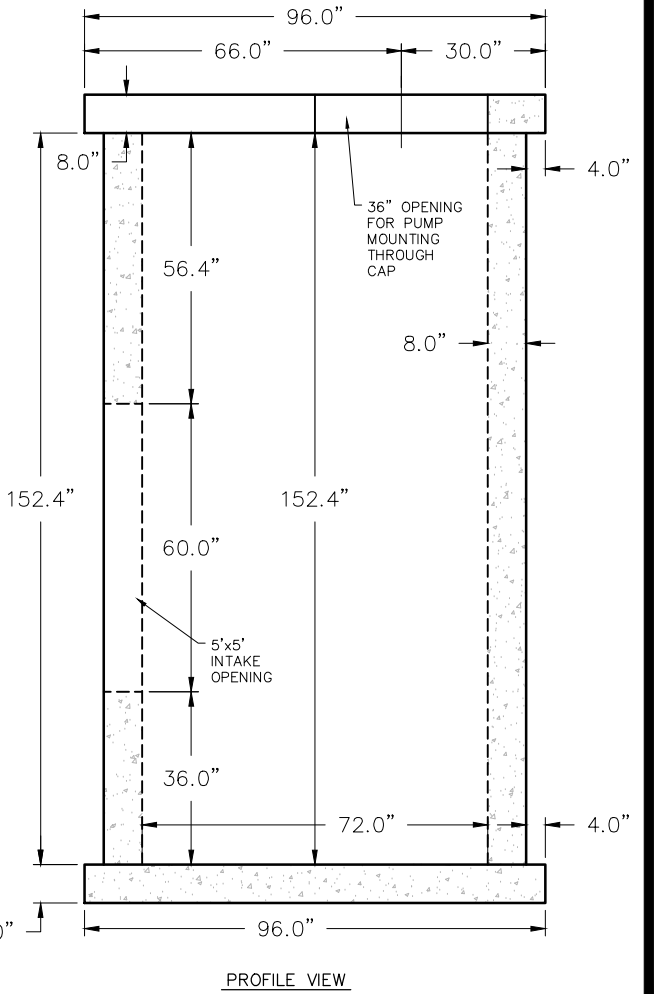
PLAN VIEW



PLAN VIEW

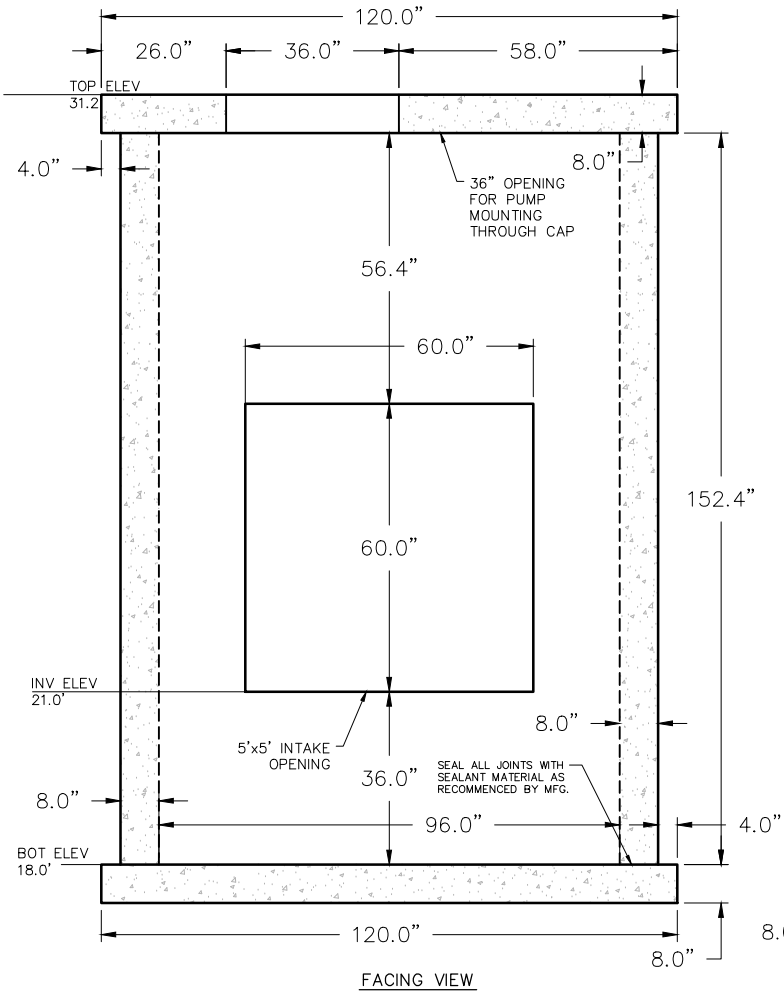


FACING VIEW

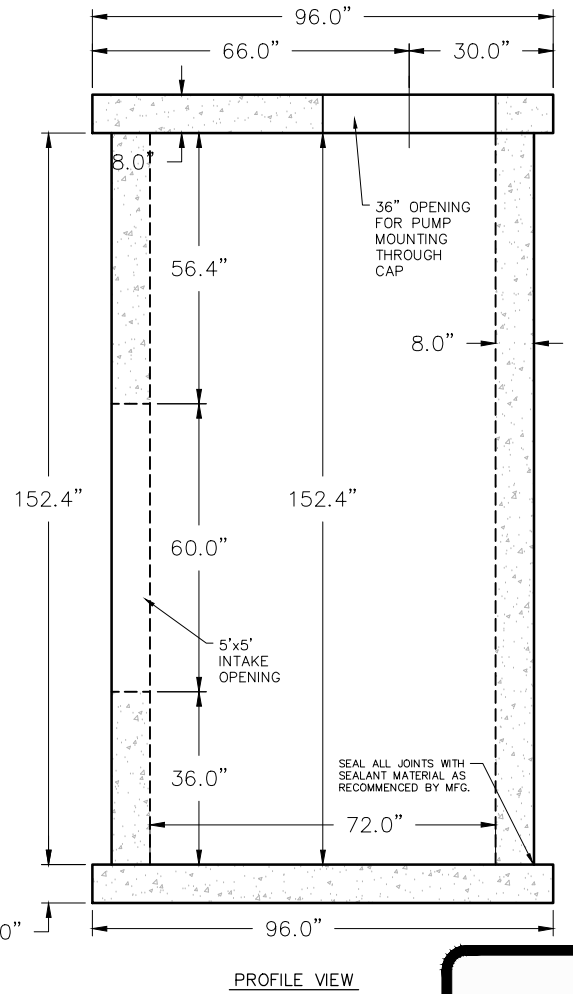


PROFILE VIEW

A NORTH PUMP SUMP



FACING VIEW



PROFILE VIEW

B SOUTH PUMP SUMP

**For Review**  
 03/05/2018 4:29:08 PM

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

PRECAST SUMP DETAILS

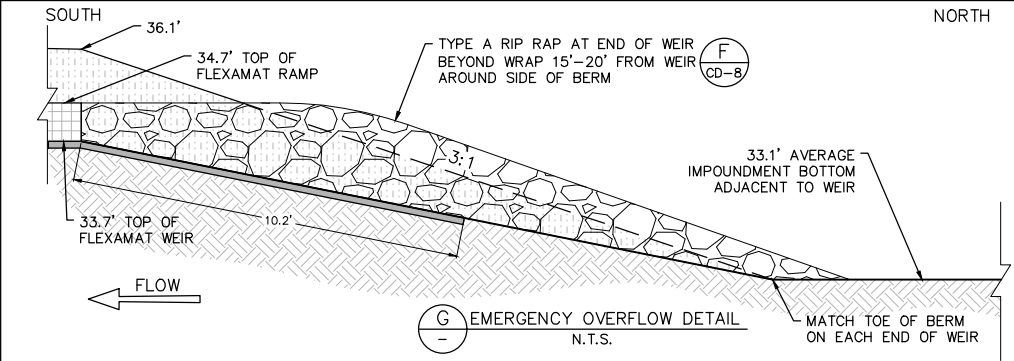
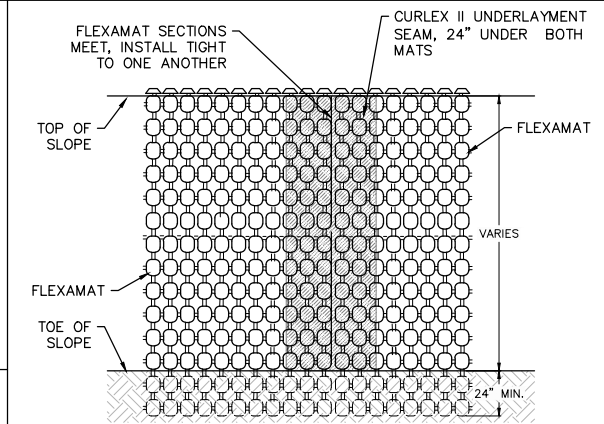
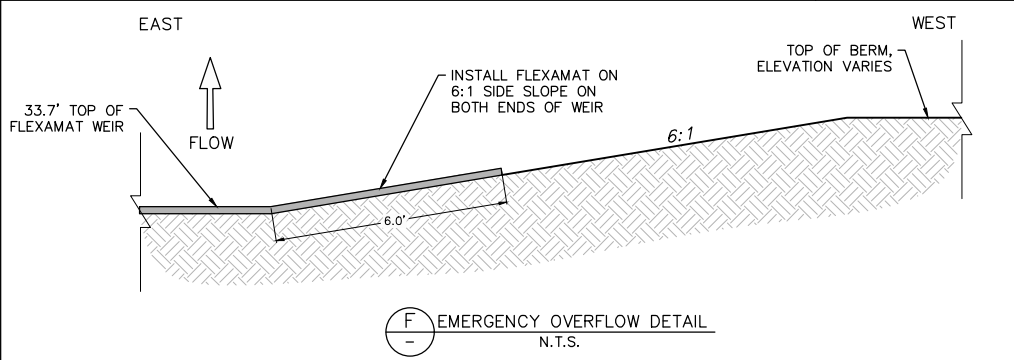
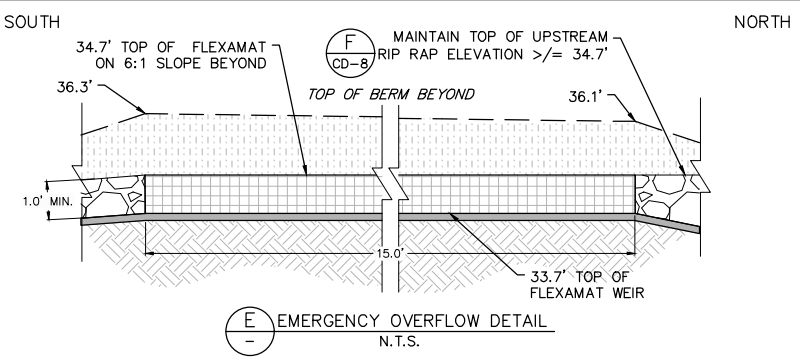
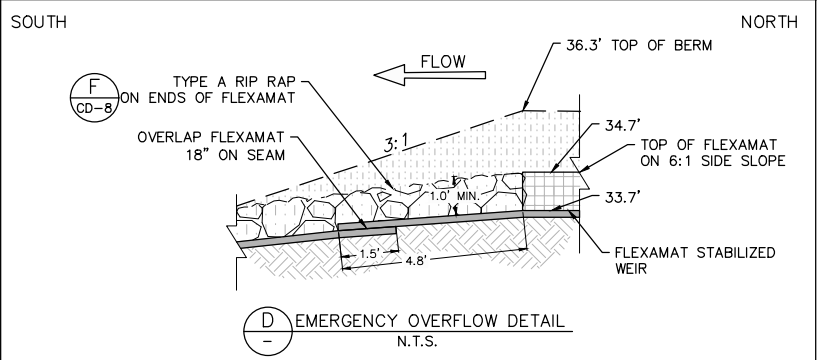
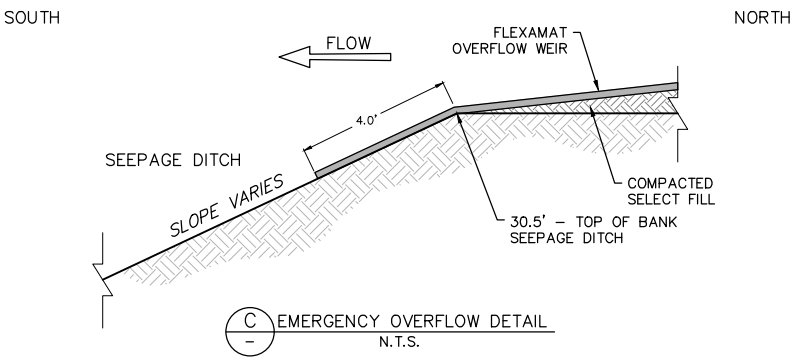
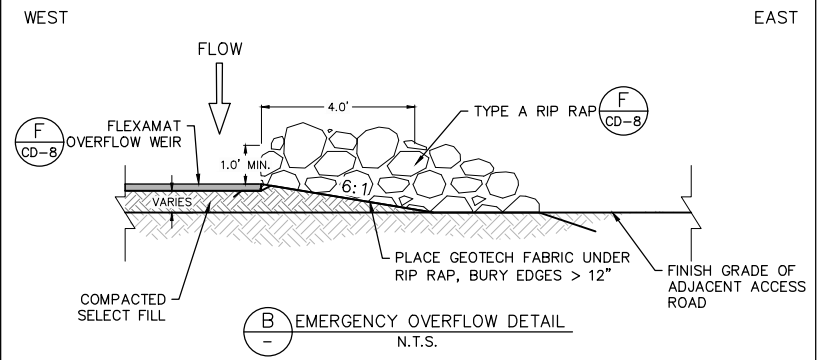
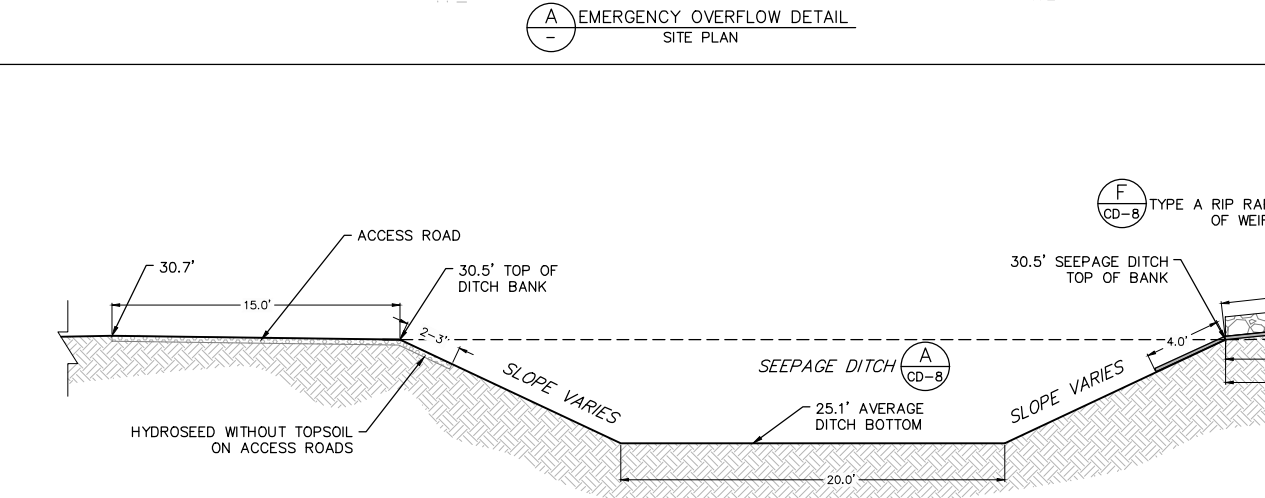
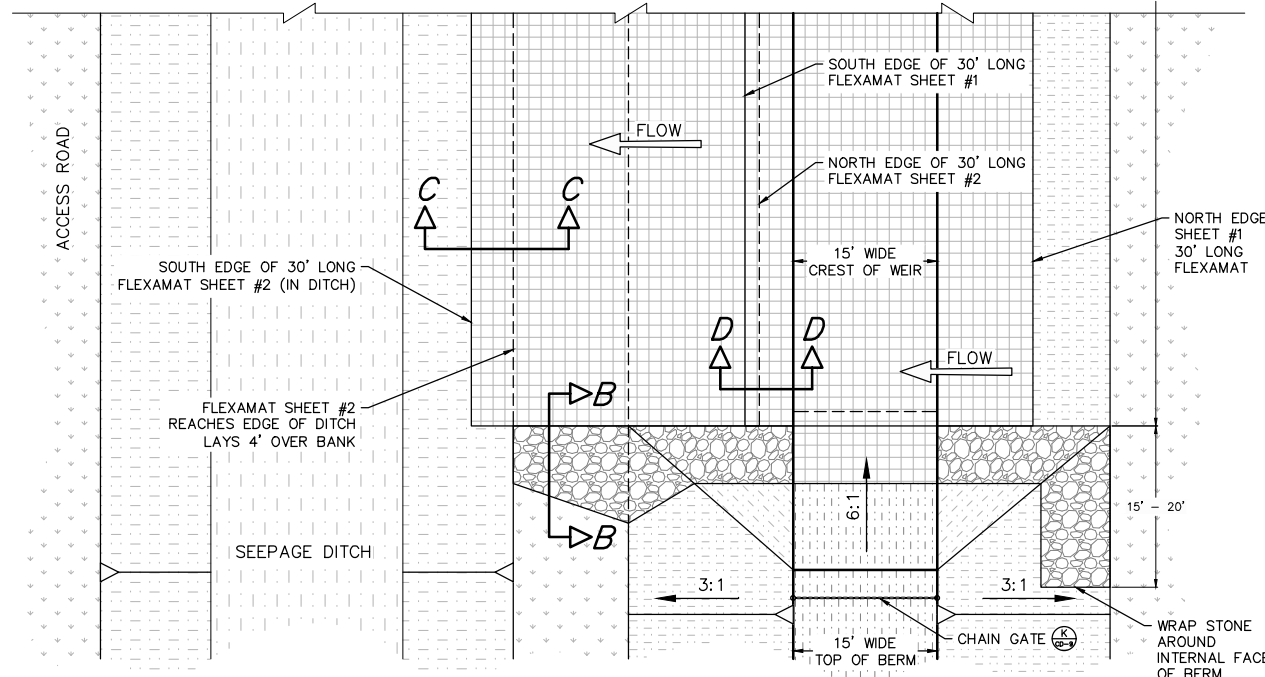
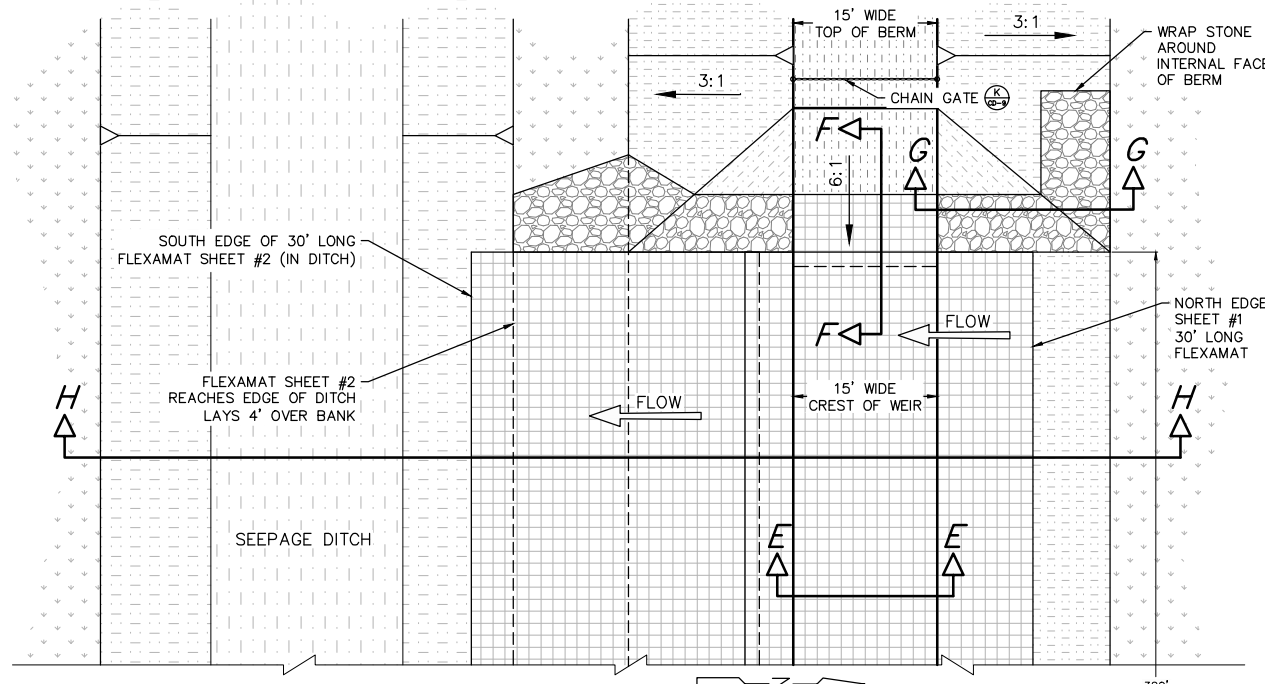
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SHEET  
 CD-3

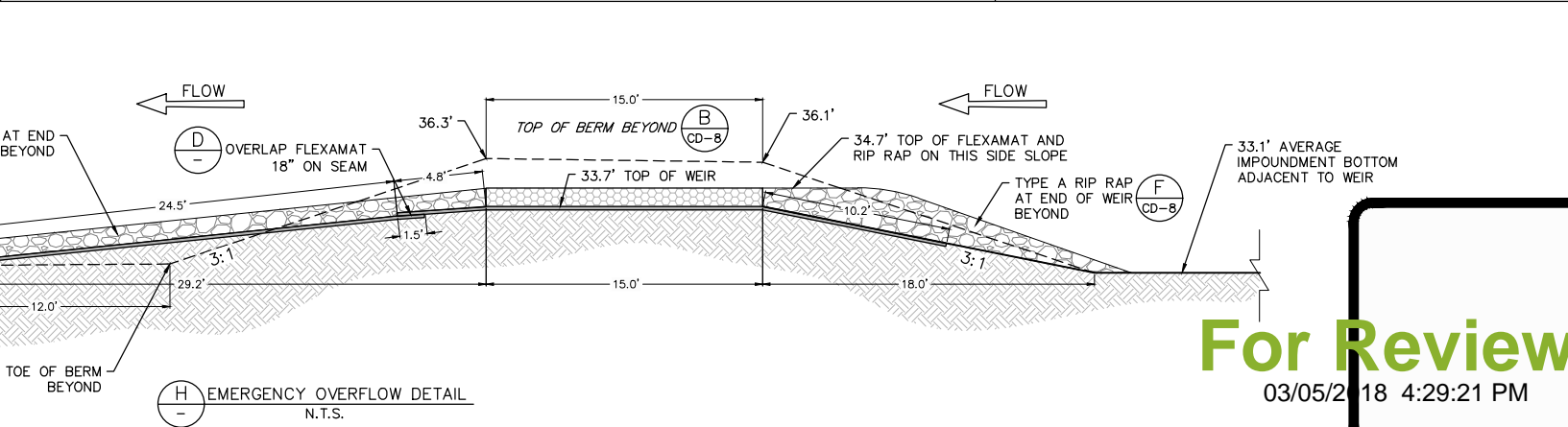
Richard A. Jones, P.E.  
 FL P.E. No. 31118







- CONSTRUCTION NOTES:**
- GRADE A UNIFORM SUBGRADE. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF STICKS, ROOTS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS.
  - PRIOR TO INSTALLING THE FLEXAMAT, SEED THE SLOPE WITH SITE SPECIFIC SEED.
  - INSTALL FLEXAMAT AS SHOWN ON THIS DETAIL SHEET AND DETAIL SHEET C-7.
  - ABUT EACH SECTION OF MAT TIGHTLY TO THE PREVIOUS SECTION. INSTALL A 4' SECTION OF CURLEX II ECB UNDER THE ABUTTED FLEXAMAT PANELS, BRIDGING THE SEAM EQUALLY SO THAT 24" OF THE ECB IS UNDER EITHER MAT.



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 03/05/2018 4:29:21 PM

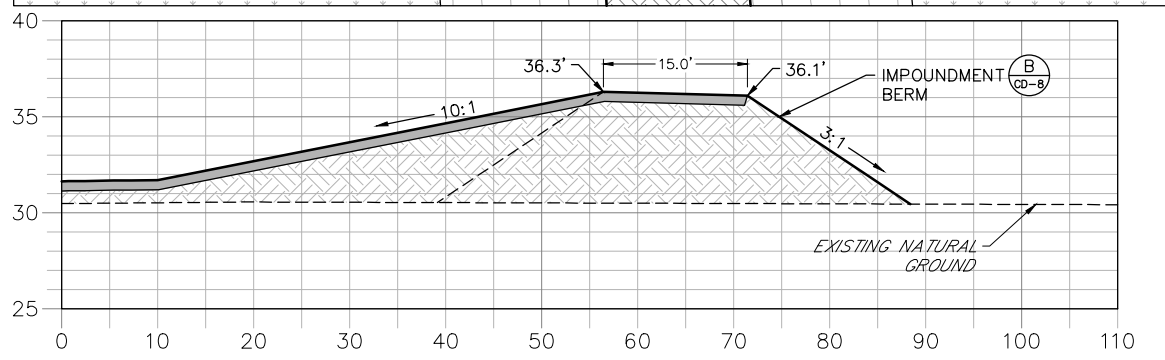
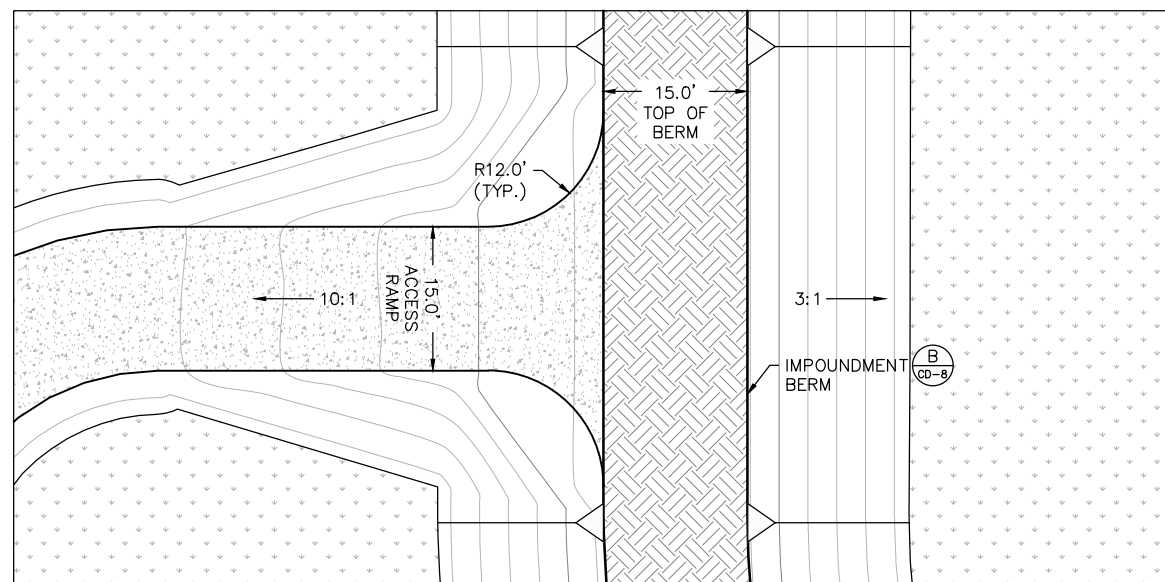


No.	Date

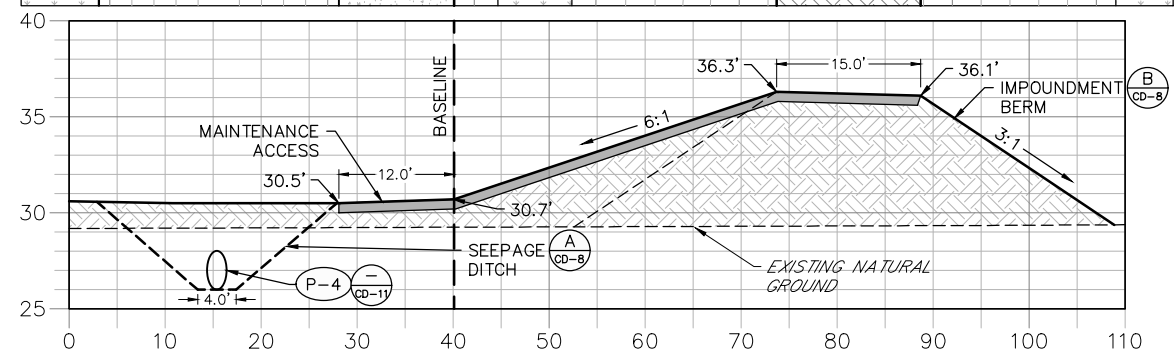
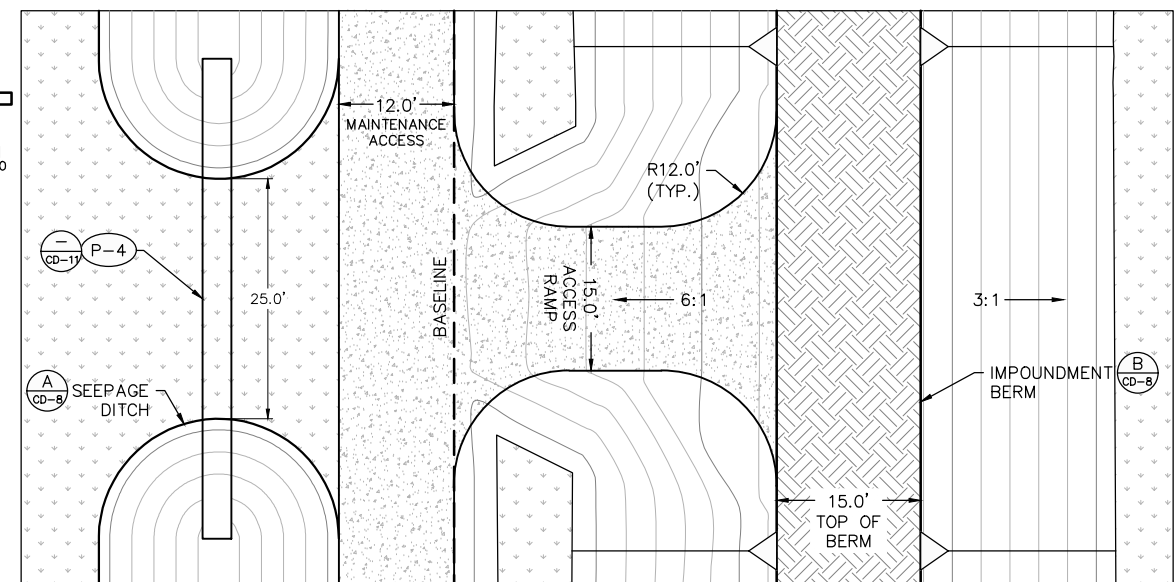
HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

ACCESS RAMP  
 DETAILS

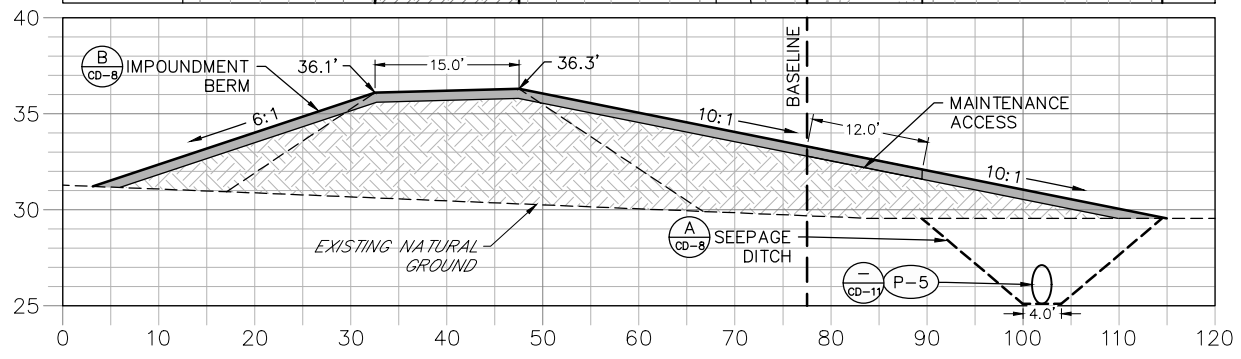
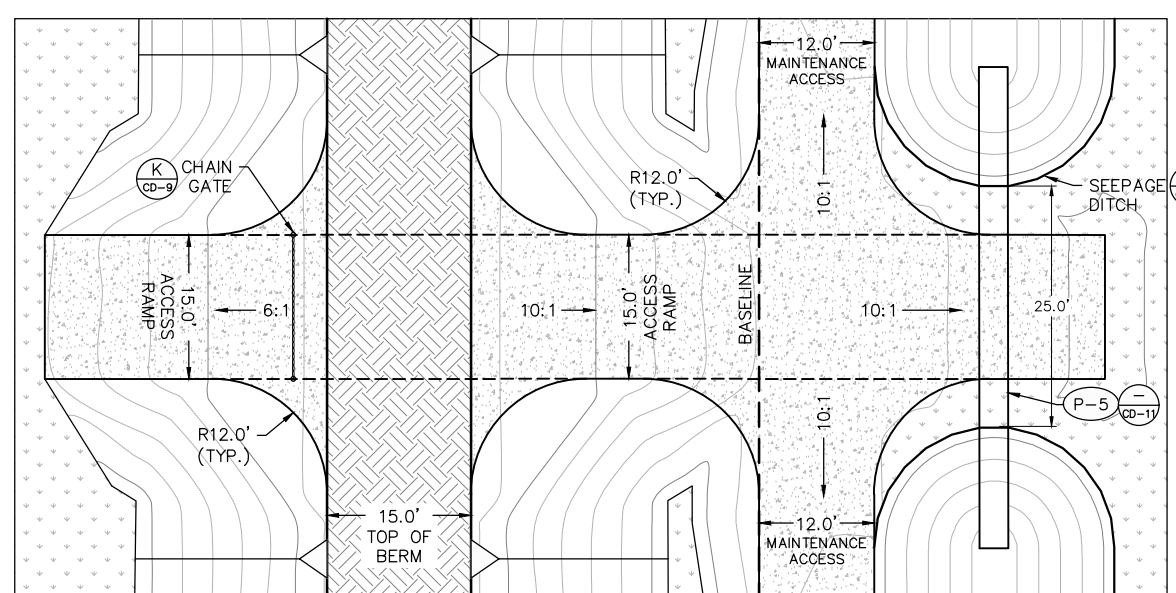
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(A) ACCESS RAMP A  
 SCALE = 2:1 (H:V)



(B) ACCESS RAMP B  
 SCALE = 2:1 (H:V)



(C) ACCESS RAMP C  
 SCALE = 2:1 (H:V)

**For Review**  
 03/05/2018 4:29:28 PM

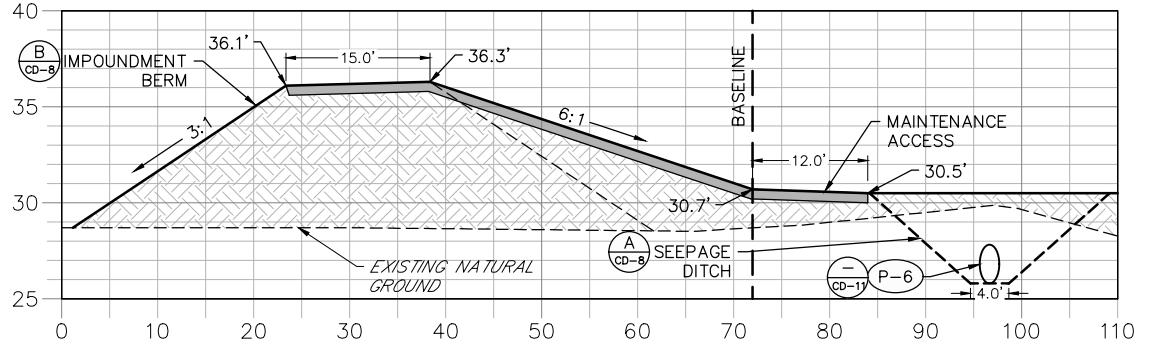
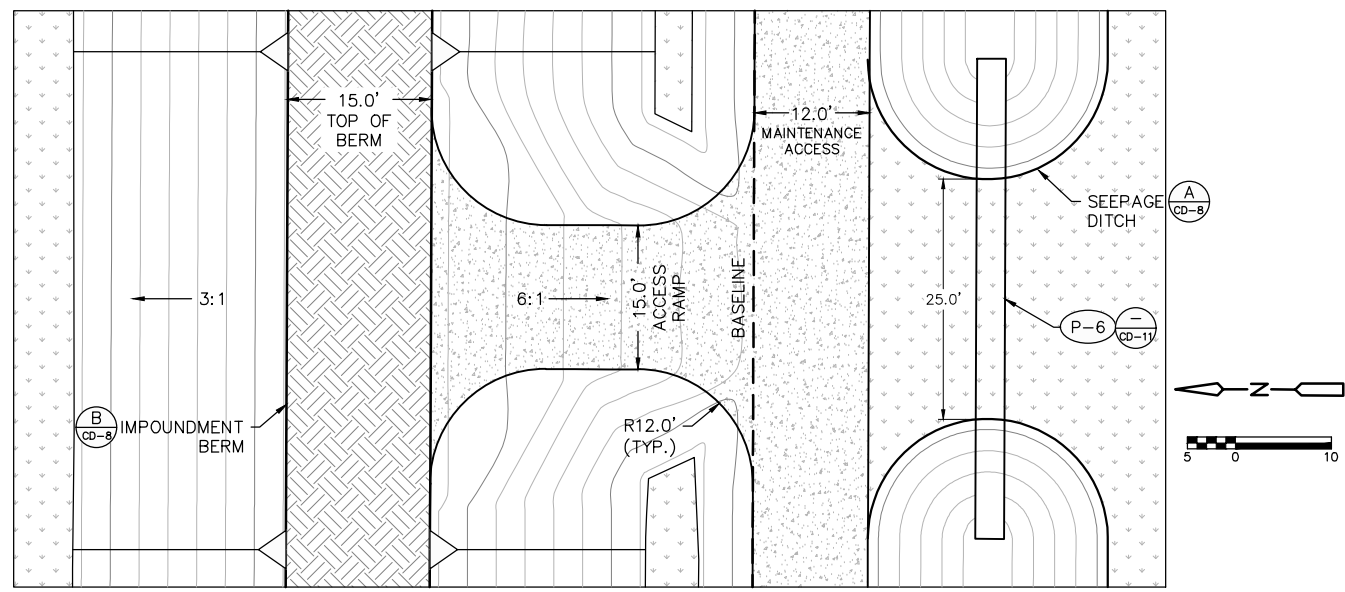
Richard A. Jones, P.E.  
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No.	Date	Revision

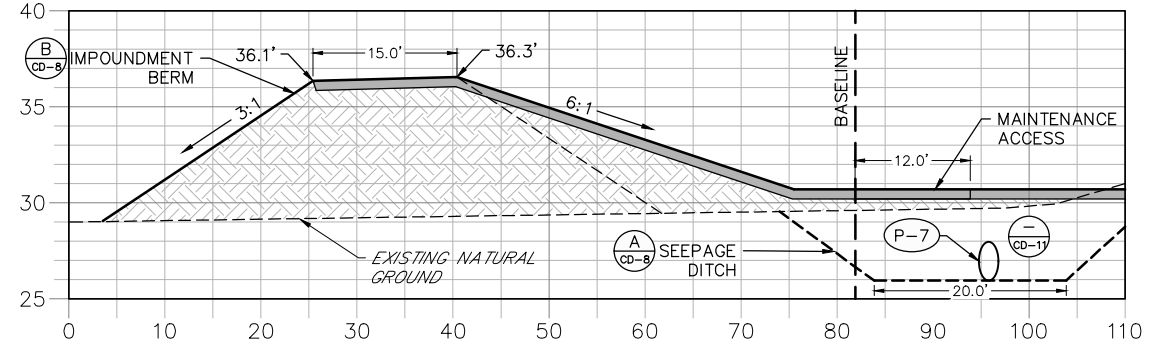
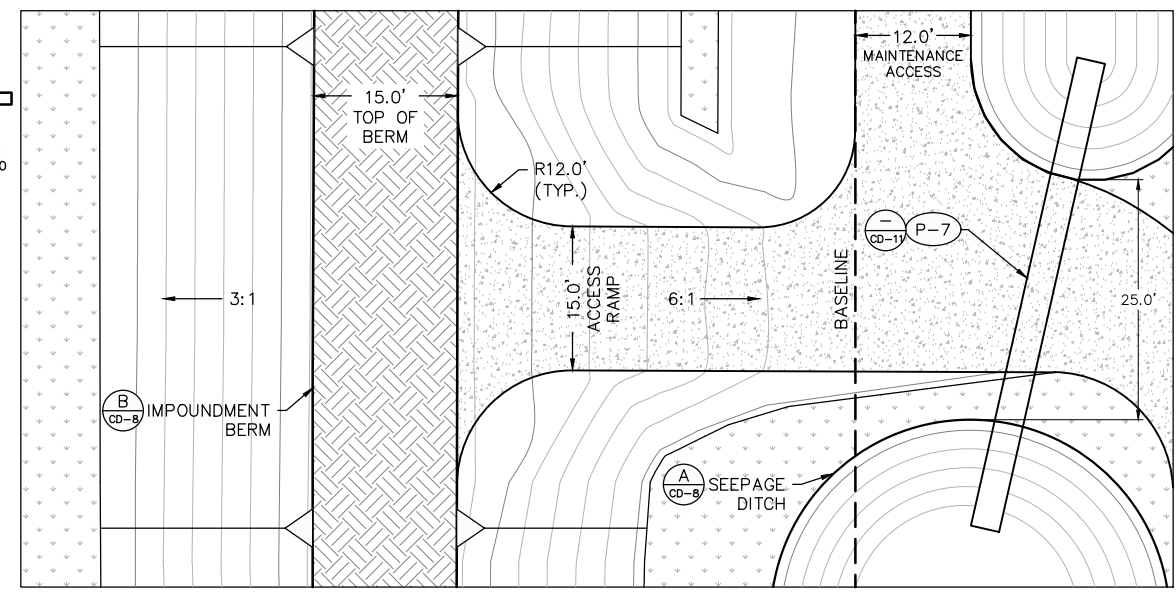
HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

ACCESS RAMP  
 DETAILS

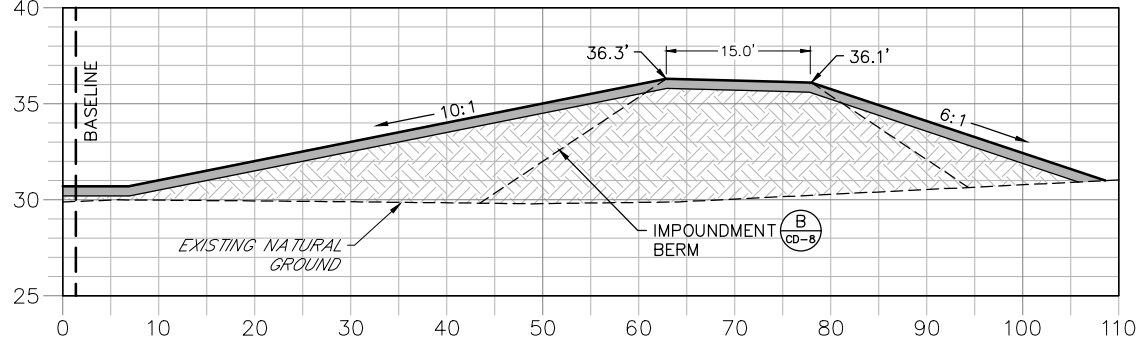
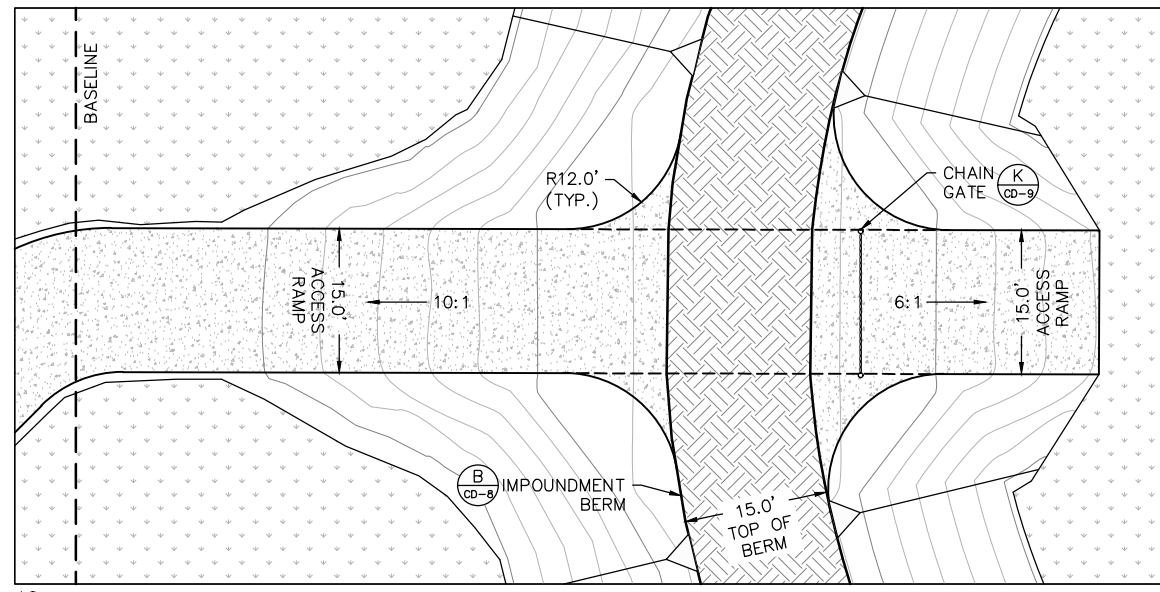
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(D) ACCESS RAMP D  
 SCALE = 2:1 (H:V)



(E) ACCESS RAMP E  
 SCALE = 2:1 (H:V)

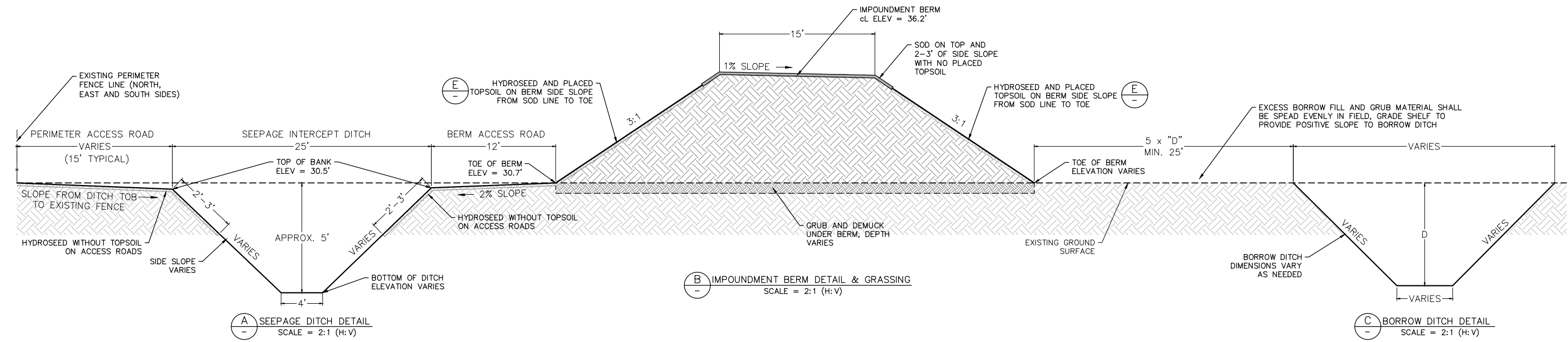


(F) ACCESS RAMP F  
 SCALE = 2:1 (H:V)

For Review

03/05/2018 4:29:35 PM

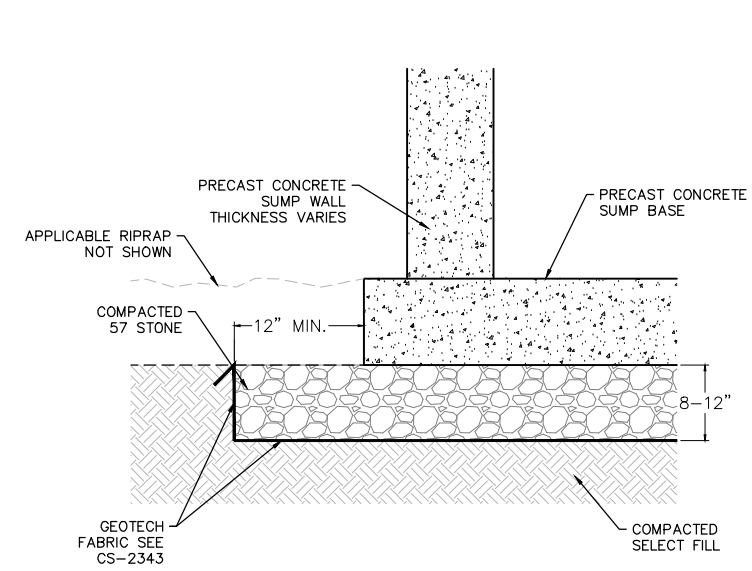
Richard A. Jones, P.E.  
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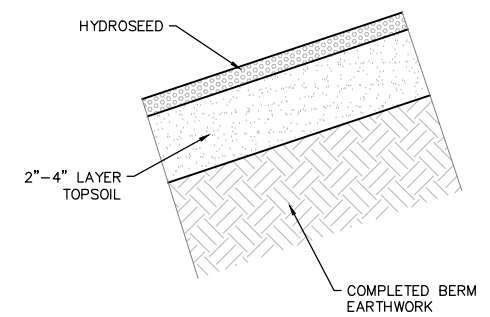
(A) SEEPAGE DITCH DETAIL  
 SCALE = 2:1 (H:V)

(B) IMPOUNDMENT BERM DETAIL & GRASSING  
 SCALE = 2:1 (H:V)

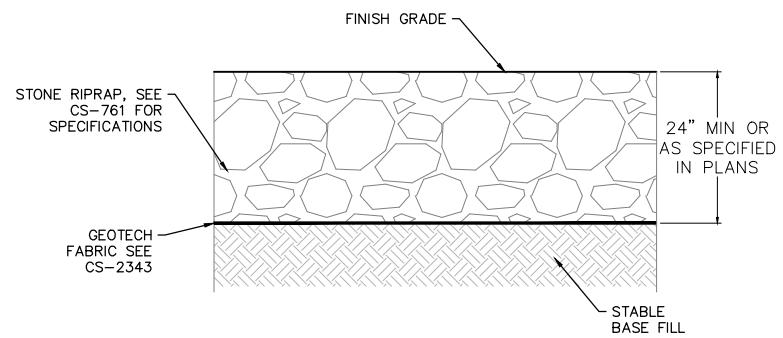
(C) BORROW DITCH DETAIL  
 SCALE = 2:1 (H:V)



(D) PRECAST CONCRETE FOUNDATION DETAIL  
 N.T.S.



(E) BERM SIDE SLOPES - GRASSING  
 N.T.S.



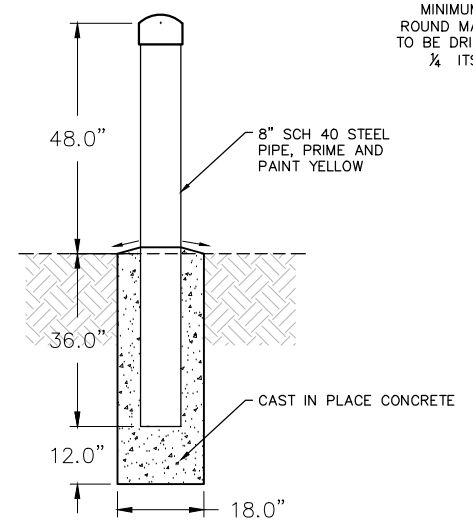
(F) STONE RIPRAP INSTALLATION DETAIL  
 N.T.S.

STAFF GAGE INFORMATION TABLE				
GAGE ID	LOCATION	LENGTH (FT)	TOP (FT NAVD 88)	BOTTOM (FT NAVD 88)
1	PUMP	7	30	23
2	POND	6	36	30
3	E.O.F.	6	36	30

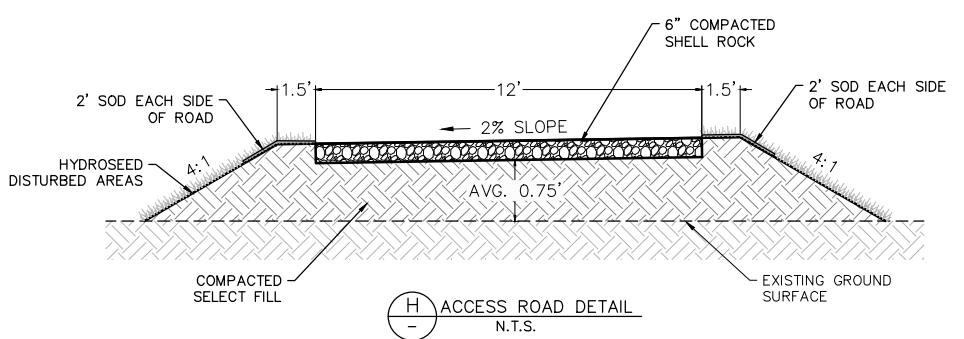
STEVENS TYPE E STAFF GAGE WITH SEPARATE FIGURE PLATES OR EQUIVALENT. PLATES TO REFLECT ACTUAL NAVD 88 ELEVATIONS VALUES

ATTACHED GAGE TO WOOD POST USING STAINLESS STEEL SCREWS PER MFG INSTRUCTIONS

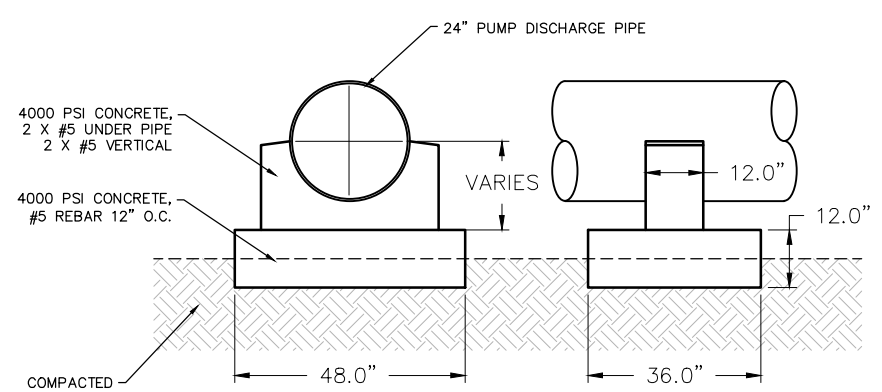
MINIMUM POST SIZE 6"x6" OR 8" ROUND MARINE GRADE WOOD. POST TO BE DRIVEN OR JETTED AT LEAST 1/4 ITS LENGTH INTO BASE SOIL



(G) STAFF GAGE  
 N.T.S.



(H) ACCESS ROAD DETAIL  
 N.T.S.



PIPE SUPPORTS SHALL BE PROVIDED MAXIMUM 10' O.C. FOR PIPE NOT BURIED IN EARTHWORK.

(I) CAST IN PLACE CONCRETE PIPE SUPPORT  
 N.T.S.

No.	Date	Revision

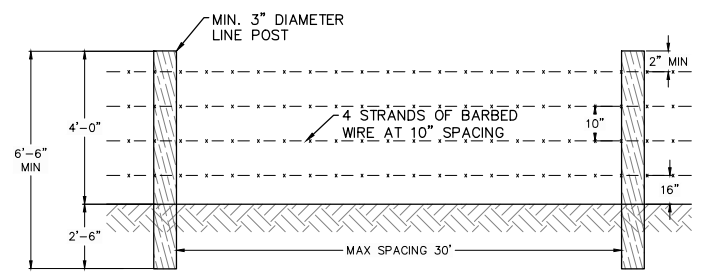
HIGHLANDS COUNTY BCC  
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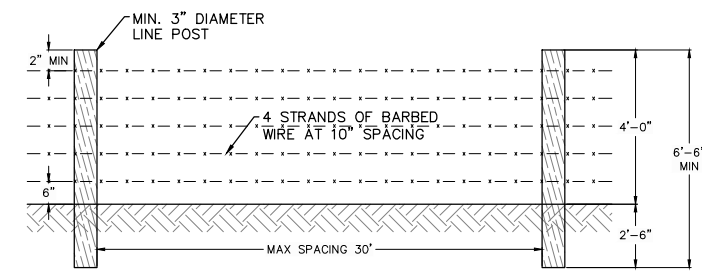
**For Review**  
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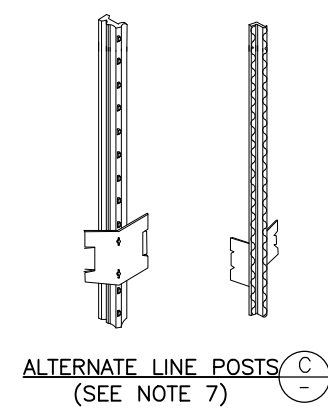


4-STRAND BARBED WIRE FENCE WITH LINE POST (A)

**BARBED WIRE FENCE**



5-STRAND BARBED WIRE FENCE WITH LINE POST (B)



ALTERNATE LINE POSTS (C)  
(SEE NOTE 7)

NOTE:  
STAYS NOT SHOWN  
SEE NOTE 3.

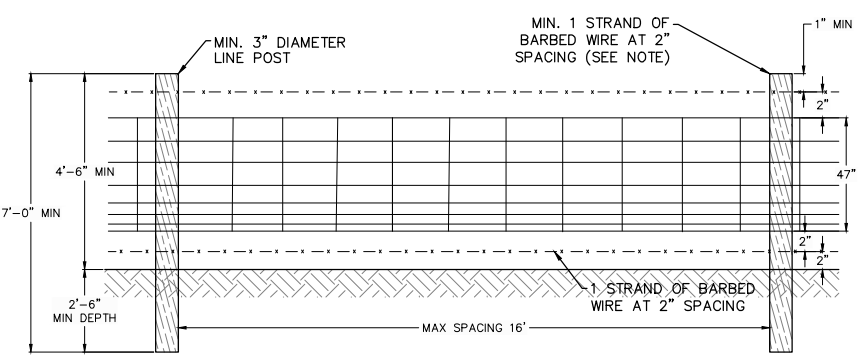
NOTE:  
STAYS NOT SHOWN  
SEE NOTE 3.

**FENCING AND GATE SPECIFICATIONS**  
(NRCS CODE 382)

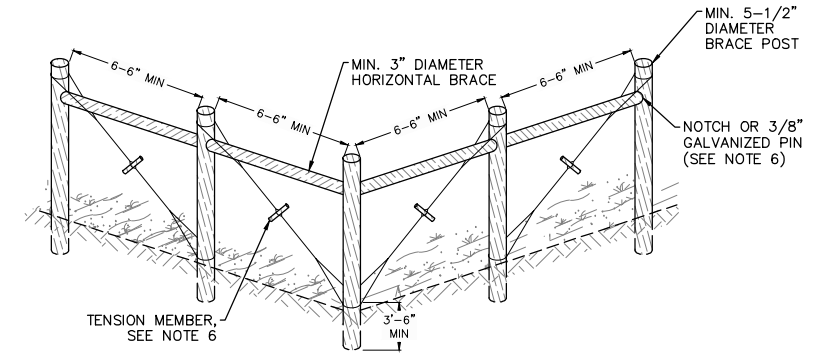
- ALL FENCES SHALL MEET N.R.C.S. STANDARDS AND SPECIFICATIONS FOR FENCING, CODE 382 IN THE LOCAL N.R.C.S. FIELD OFFICE TECHNICAL GUIDE.
- BARBED WIRE SHALL BE CLASS 3 GALVANIZED CONFORMING TO ASTM A121. BARBED WIRE SHALL BE ATTACHED TO THE POST ON THE SIDE THAT WILL RECEIVE THE GREATEST AMOUNT OF PRESSURE, EXCEPT IN CORNERS. BARBS SHALL BE SPACED NO MORE THAN 5 INCH CENTERS WITH 4-POINT OR 4 INCH CENTERS WITH 2-POINT BARB. ALL BARBED WIRE SHALL BE THE DOUBLE STRAND TYPE AND SHALL MEET ONE OF THE FOLLOWING CRITERIA:
  - MINIMUM 12 1/2 GAGE STANDARD STEEL WIRE.
  - MINIMUM 15 1/2 GAGE HIGH TENSILE STRENGTH STEEL WIRE.
- POST SPACING SHALL NOT EXCEED 30 FEET. IF POSTS ARE PLACED MORE THAN 16 FT. APART, STAYS WILL BE REQUIRED. STAYS SHALL BE PLACED AS FOLLOWS:

POST SPACING	STAYS
< 16'	0
> 16' AND < 22'	1
> 22' AND < 30'	2

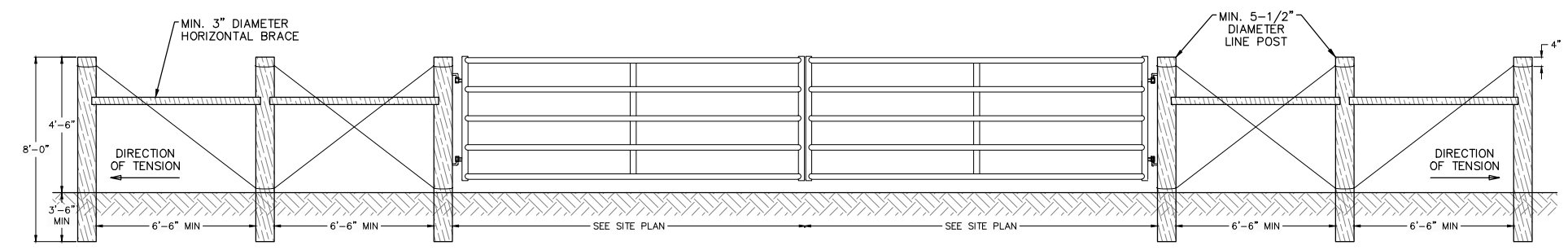
- STAPLES SHALL BE 9 GAGE, CLASS 3 GALVANIZED, AND SHALL BE A MINIMUM OF 1 1/2 INCHES LONG FOR SOFT WOODS AND 1 INCH LONG FOR HARD WOOD POSTS. NAILS SHALL BE GALVANIZED AND SPIRAL OR RING SHAPED AT LEAST 3 1/2 INCHES LONG.
- ALL WIRE AND HARDWARE WILL BE NEW GALVANIZED MATERIAL.
- BRACES ARE REQUIRED AT ALL CORNERS, GATES, AT ALL DEFINITE ANGLES (>15 DEGREES) IN THE FENCE LINE, AND AT INTERVALS NOT TO EXCEED 1320 FEET. A TENSION MEMBER COMPOSED OF 2 COMPLETE LOOPS OF 9 GAGE SMOOTH WIRE OR DOUBLE STRAND BARBED WIRE SHALL EXTEND FROM A POINT APPROXIMATELY 6 INCHES BELOW THE TOP OF THE VERTICAL BRACE POST TO 3" ABOVE GROUND LEVEL OF THE POST BEING BRACED. THE BRACE WIRE SHALL BE TWISTED TO SECURE THE BRACE AND PROVIDE NEEDED RIGIDITY. THE HORIZONTAL BRACE SHALL BE NOTCHED INTO THE BRACE POST AND POST BEING BRACED AND/OR USE 3/8" GALVANIZED PIN OR SPIKE DRIVEN THROUGH THE POST THAT PENETRATES THE HORIZONTAL MEMBER AT LEAST 4" IN DEPTH.
- STANDARD "TEE" OR "U" SECTION STEEL POST CONFORMING TO ASTM A702 MAY BE USED FOR TEMPORARY FENCING IN LIEU OF WOODEN LINE POSTS. LENGTH SHALL BE SAME AS FOR WOODEN POST. STEEL POST SHALL BE ROLLED FROM HIGH CARBON STEEL AND WEIGH A MINIMUM OF 12.25 LB/FT, EXCLUSIVE OF THE ANCHOR PLATE. THE COATING MAY BE EITHER GALVANIZED BY THE HOT DIP PROCESS OR PAINTING IN ACCORDANCE WITH COMMERCIAL STANDARD 184 WITH ONE OR MORE COATS OF HIGH GRADE, WEATHER RESISTANT STEEL PAINT, OR ENAMEL. STEEL POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED FOR THE ATTACHMENT OF WIRE TO THE POSTS. WIRE SHALL BE ATTACHED TO THE POSTS BY WRAPPING WITH 14 GAGE GALVANIZED WIRE OR BY USE OF MANUFACTURER'S SPECIAL DESIGNED CLIPS.



WOVEN WIRE FENCE (D)



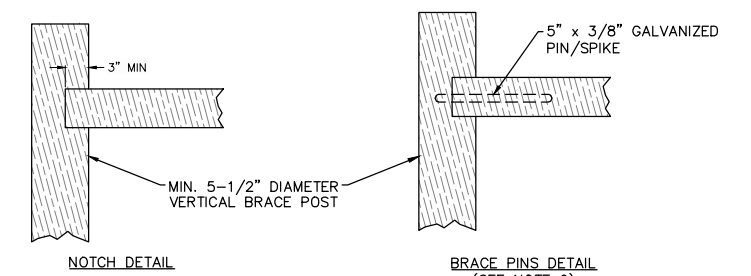
CORNER BRACE (E)  
(SEE NOTE 6)



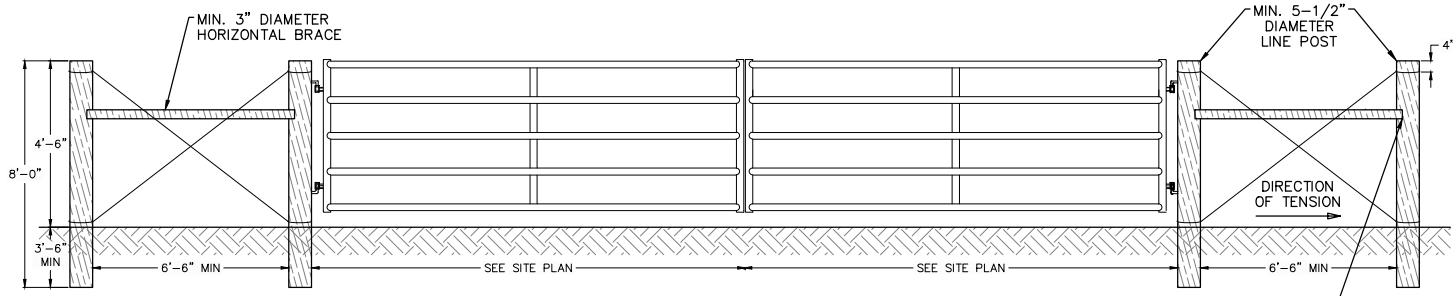
GATES SHALL BE WELDED ROUND TUBE, HOT DIPPED GALVANIZED STEEL, AFTER FABRICATION. VERTICALS SHALL BE 2" X 11 GAUGE AND HORIZONTAL SHALL BE 1.9" X 12 GAUGE.

GATE PANEL DETAIL WITH DOUBLE END BRACE (F)

USE DOUBLE END BRACES FOR FENCES THAT EXCEED 660' WITHOUT A GATE, CORNER OR TEE.



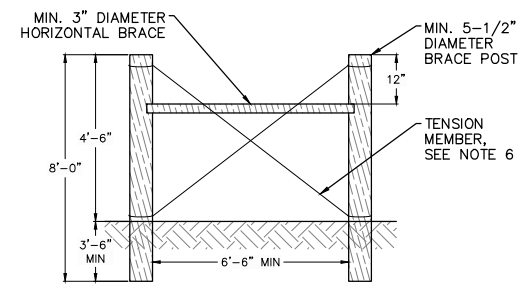
HORIZONTAL BRACE CONNECTION (G)



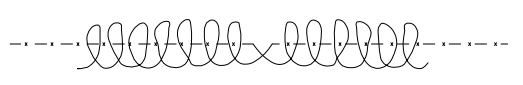
GATES SHALL BE WELDED ROUND TUBE, HOT DIPPED GALVANIZED STEEL, AFTER FABRICATION. VERTICALS SHALL BE 2" X 11 GAUGE AND HORIZONTAL SHALL BE 1.9" X 12 GAUGE.

GATE PANEL DETAIL WITH SINGLE END BRACE (H)

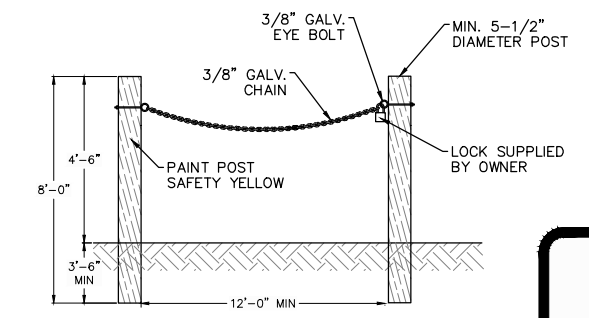
USE SINGLE END BRACES FOR FENCES THAT ARE LESS THAN 660' WITHOUT A GATE, CORNER, OR TEE.



SINGLE HORIZONTAL IN-LINE BRACE (I)



BARBED WIRE SPLICING (J)



CHAIN GATE DETAIL (K)

CHAIN GATES SHALL BE USED TO LIMIT VEHICLE ACCESS. INSTALL ONE AT EACH INTERNAL POND RAMP AND ONE ON EACH END OF THE EMERGENCY OVERFLOW WEIR.

**For Review**

03/05/2018 4:29:50 PM

Richard A. Jones, P.E.  
FL P.E. No. 31118

Job: 0202-02-ES  
Scale: As Shown  
Date: 3-5-2018  
Design: R.A.J.  
Drawn: J.J.D.  
Checked: D.C.R.  
Approved: B.L.R.

Revision	No.	Date

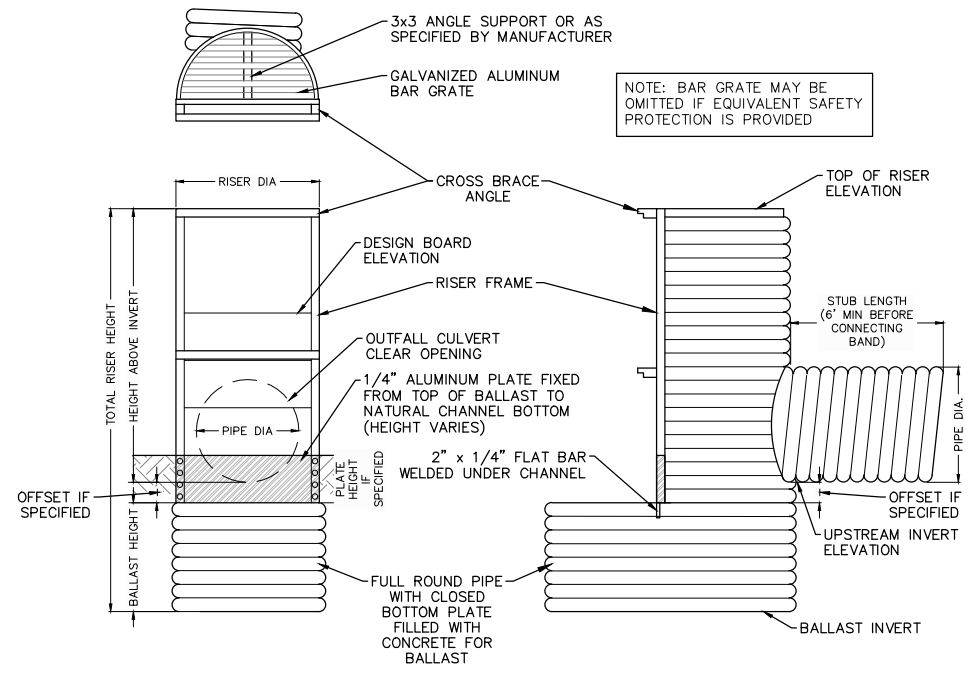
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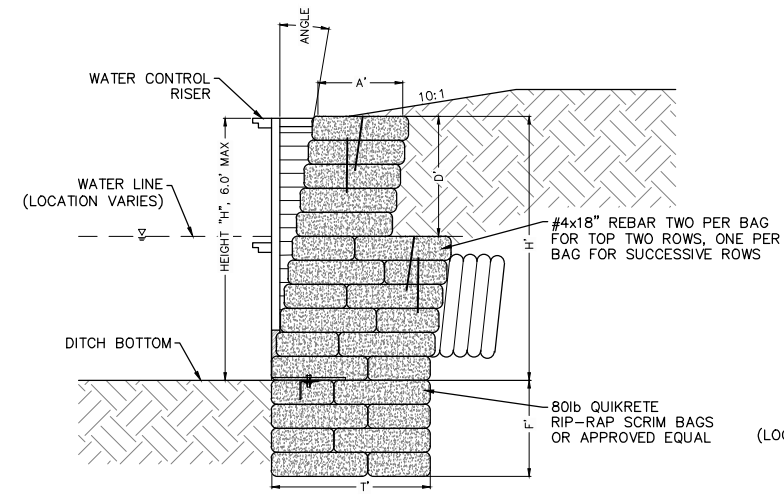
Royal Consulting Services, Inc.  
211 West Warren Avenue  
Longwood, FL 32750  
(407) 831-3095 phone  
(407) 831-5095 fax  
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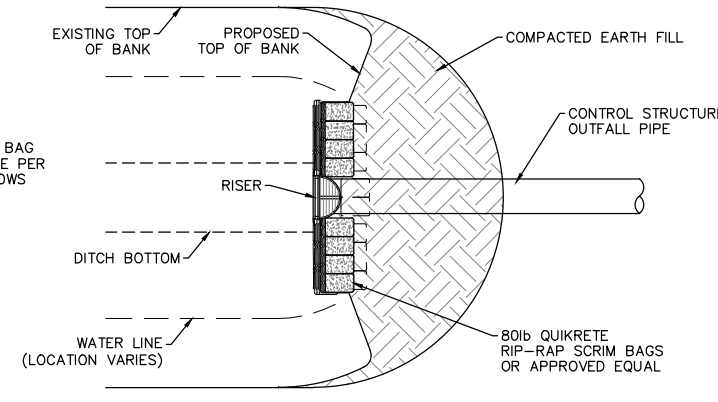


FLASHBOARD W/INTERNAL BALLAST



SAND CEMENT BAGS SHALL BE USED TO STABILIZE THE SIDE SLOPES OF THE PUMP DISCHARGE AND MAY BE USED IN LIEU OF CATWALKS AND HANDRAILS FOR ACCESS TO FLASH BOARD RISERS.

SAND CEMENT BAG HEADWALL



SAND CEMENT HEADWALLS HEIGHT "H" VS. MINIMUM DIMENSIONS (FT)				
H	T	F	A	D
2	2	1	1	1
2.5	2	1	1	1
3	2	1	1	2
3.5	3	1.5	1	2
4	3	1.5	1	2
4.5	3	1.5	1	2
5	3	2	1	2
5.5	3	2	1	2
6	3	2	1	2

CULVERT INFORMATION TABLE									
ID	QTY.	MATERIAL	GAUGE	CORRUGATION	DIAMETER (in.)	LENGTH (ft.)	U/S INVERT (ft.)	D/S INVERT (ft.)	MIN. COVER (in.)
P-1	2	HDPE	na	na	42.0	232.0	20.0	19.0	15.0
P-2	2	ALUM	8	2-2/3 x 1/2	72.0	66.0	25.1	24.9	24.0
P-3	1	HDPE	na	na	42.0	100.0	26.0	26.0	15.0
P-4	1	HDPE	na	na	24.0	50.0	26.0	25.9	15.0
P-5	1	HDPE	na	na	24.0	50.0	25.9	25.8	15.0
P-6	1	HDPE	na	na	24.0	50.0	25.8	25.7	15.0
P-7	1	HDPE	na	na	24.0	50.0	25.7	25.6	15.0
P-8	4	HDPE	na	na	42.0	153.0	25.2	25.0	15.0
P-9	1	HDPE	na	na	24.0	70.0	see note	see note	15.0
P-10	1	HDPE	na	na	24.0	60.0	see note	see note	15.0
P-11	1	ALUM	16	2-2/3 x 1/2	18.0	51.0	32.6	29.4	15.0
P-12	2	HDPE	na	na	48.0	94.0	23.2	23.0	15.0
P-13	1	ALUM	16	2-2/3 x 1/2	24.0	79.0	26.6	26.3	15.0
P-14	1	HDPE	na	na	24.0	71.0	27.7	27.5	15.0
P-15	1	ALUM	16	2-2/3 x 1/2	24.0	76.0	26.0	25.7	15.0

Note: Seepage ditch bottom elevation varies as needed to provide fill. Connecting culverts shall match bottom elevation, and maintain 2% slope.

CONTROL STRUCTURE INFORMATION TABLE																
ID	QTY	RISER INFORMATION							OUTFALL INFORMATION							
		MATERIAL	GAUGE	CORRUGATION	DIAMETER (in.)	TOP (ft.)	BALLAST (ft.)	TOTAL (ft.)	MATERIAL	GAUGE	CORRUGATION	DIAMETER (in.)	LENGTH (ft.)	U/S INVERT (ft.)	D/S INVERT (ft.)	MIN. COVER (in.)
CS-1	2	ALUM	12	2-2/3 x 1/2	48.0	31.0	2.0	7.8	ALUM	14	2-2/3 x 1/2	36.0	87.0	25.2	25.0	18.0
CS-2	1	ALUM	16	2-2/3 x 1/2	24.0	32.3	1.0	5.0	ALUM	16	2-2/3 x 1/2	24.0	52.0	28.3	28.1	15.0
CS-3	1	ALUM	16	2-2/3 x 1/2	24.0	33.0	1.3	6.3	ALUM	16	2-2/3 x 1/2	24.0	58.0	28.0	27.8	15.0
CS-4	1	ALUM	16	2-2/3 x 1/2	24.0	34.0	1.4	6.9	ALUM	16	2-2/3 x 1/2	24.0	47.0	28.5	28.3	15.0
CS-5	1	ALUM	16	2-2/3 x 1/2	24.0	32.5	1.2	5.8	ALUM	16	2-2/3 x 1/2	24.0	69.0	27.9	27.7	15.0
CS-6	1	ALUM	16	2-2/3 x 1/2	24.0	32.5	1.2	5.8	ALUM	16	2-2/3 x 1/2	24.0	69.0	27.9	27.7	15.0
CS-7	1	ALUM	14	2-2/3 x 1/2	30.0	31.8	1.5	6.8	ALUM	14	2-2/3 x 1/2	30.0	74.0	26.5	26.3	18.0
CS-8	1	ALUM	16	2-2/3 x 1/2	24.0	32.4	1.0	4.5	ALUM	16	2-2/3 x 1/2	24.0	65.0	28.9	28.7	15.0
CS-9	1	ALUM	14	2-2/3 x 1/2	36.0	34.4	1.6	6.4	ALUM	14	2-2/3 x 1/2	30.0	48.0	28.0	27.8	18.0

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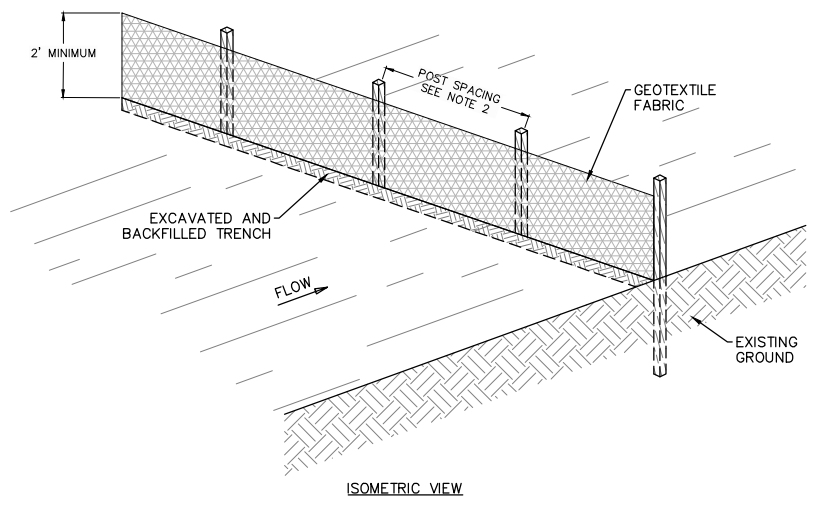
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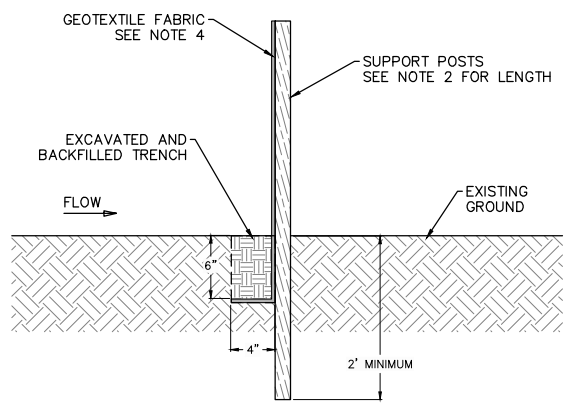
RISER DETAILS AND  
 STRUCTURE INFORMATION

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 211 West Warren Avenue  
 Longwood, FL 32750  
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 (407) 831-5095 fax  
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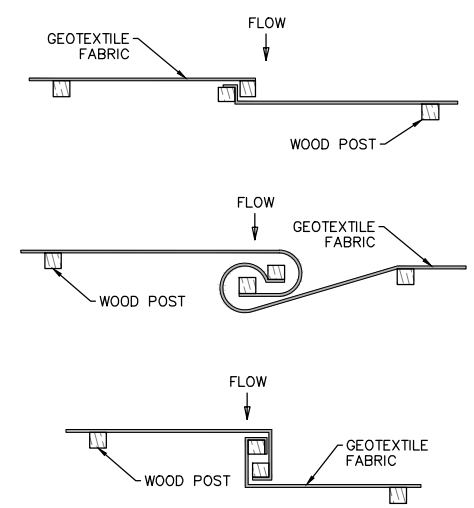




ISOMETRIC VIEW

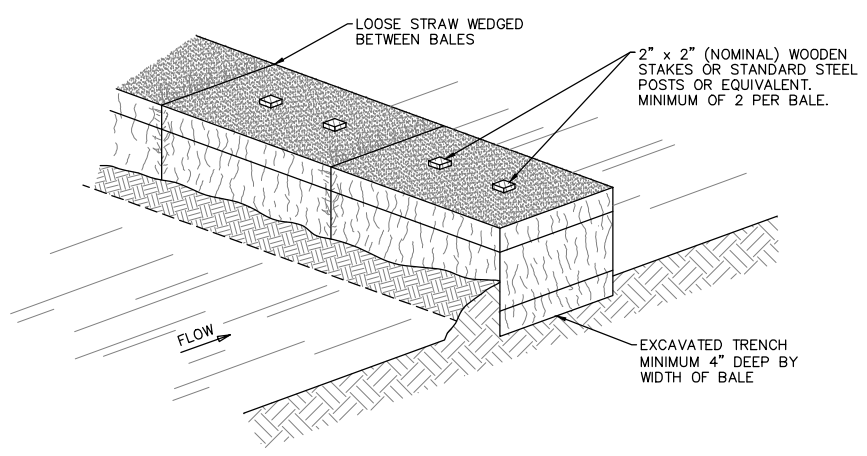


TYPICAL SECTION

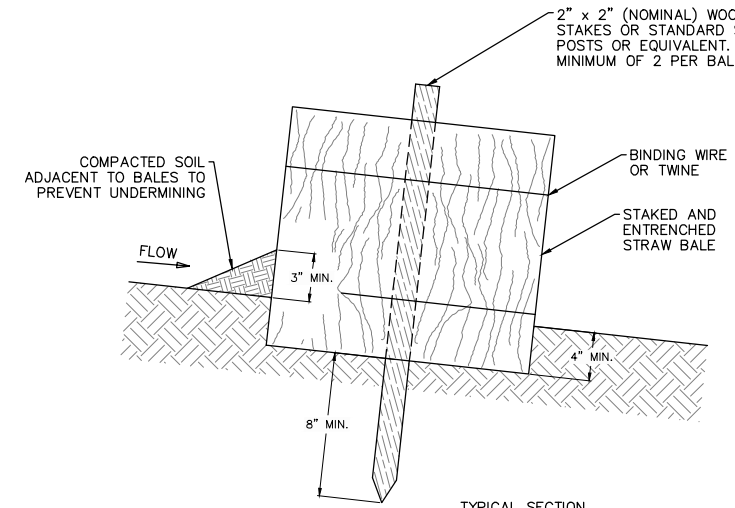


TWIST JOINING METHODS

SILT FENCE INSTALLATION **A**

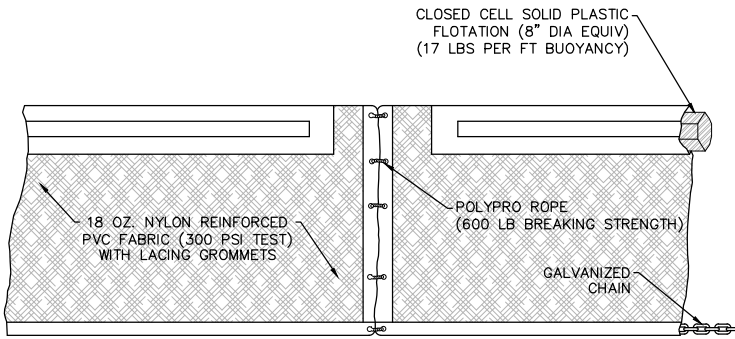


ISOMETRIC VIEW

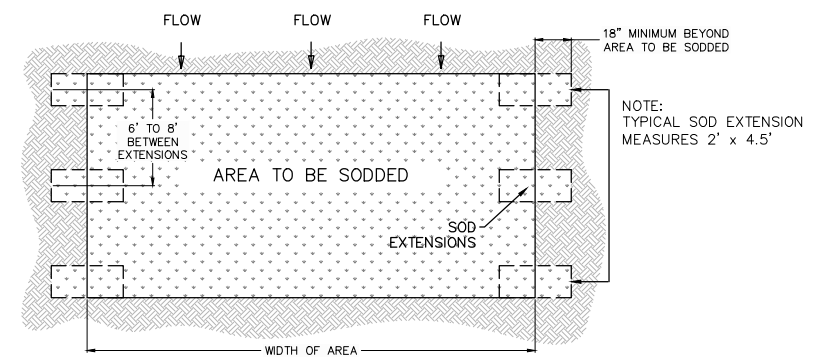


TYPICAL SECTION

STRAW BALE INSTALLATION **B**



FLOATING TURBIDITY BARRIER **C**



SOD INSTALLATION **D**

**EROSION CONTROL SPECIFICATIONS**  
(CONSTRUCTION CODES 005 & 006)

IT IS THE CONTRACTORS RESPONSIBILITY TO IMPLEMENT THE EROSION AND TURBIDITY CONTROLS AS SHOWN ON THE EROSION AND TURBIDITY CONTROL PLAN. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO ENSURE THESE CONTROLS ARE PROPERLY INSTALLED, MAINTAINED AND FUNCTIONING PROPERLY TO PREVENT TURBID OR POLLUTED WATER FROM LEAVING THE PROJECT SITE. THE CONTRACTOR WILL ADJUST THE EROSION AND TURBIDITY CONTROLS SHOWN ON THE EROSION AND TURBIDITY CONTROL PLAN AND ADD ADDITIONAL CONTROL MEASURES, AS REQUIRED, TO ENSURE THE SITE MEETS ALL FEDERAL, STATE AND LOCAL EROSION AND TURBIDITY CONTROL REQUIREMENTS. THE FOLLOWING BEST MANAGEMENT PRACTICES WILL BE IMPLEMENTED BY THE CONTRACTOR AS REQUIRED BY THE EROSION AND TURBIDITY CONTROL PLAN AND AS REQUIRED SITE BY THE REGULATORY AGENCIES.

1. SEDIMENT BASINS AND TRAPS, PERIMETER DITCHES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP BEFORE ANY LAND-DISTURBING TAKES PLACE TO MEET THE EROSION AND TURBIDITY REQUIREMENTS IMPOSED ON THE PROJECT.
2. ALL SEDIMENT CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON BALANCE OF SITE. PERIMETER SEDIMENT BARRIERS SHALL BE CONSTRUCTED TO PREVENT SEDIMENT OR TRASH FROM FLOWING OR FLOATING ON TO ADJACENT PROPERTIES.
3. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCK PILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTIONS AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.
4. AFTER ANY SIGNIFICANT RAINFALL SEDIMENT CONTROL STRUCTURES WILL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE REPAIRED IMMEDIATELY.
5. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAINS STRUCTURE.
6. WHENEVER WATER SEEPS FROM A SLOPE FACE ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
7. SEDIMENT WILL BE PREVENTED FROM ENTERING ANY STORM DRAIN SYSTEM, DITCH, OR CHANNEL. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT. GRATE INLETS AND CURB INLETS SHALL BE PROTECTED WITH GRATE INLET PROTECTION PCD-1000 AND CURB INLET PROTECTION PRODUCED BY SUNTREE ISLES, INC., OR APPROVED EQUAL.
8. BEFORE TEMPORARY OR NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS ARE MADE OPERATIONAL ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.
9. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENRICHMENT. CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.
10. STOCKPILING MATERIAL: NO EXCAVATED MATERIAL SHALL BE STOCKPILED IN SUCH A MANNER AS TO DIRECT RUNOFF DIRECTLY OFF THE PROJECT SITE INTO ANY ADJACENT WATER BODY OR STORM WATER COLLECTION FACILITY.
11. EXPOSED AREA LIMITATION: THE SURFACE AREA OF OPEN, RAW ERODIBLE SOIL EXPOSED BY CLEARING AND GRUBBING OPERATIONS OR EXCAVATION AND FILLING OPERATIONS SHALL NOT EXCEED 5 ACRES. IF THE TOTAL AREA TO BE CLEARED IS EQUAL TO, OR EXCEEDS FIVE (5) ACRES, THEN THE CONTRACTOR WILL BE RESPONSIBLE FOR PREPARING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH EPA'S NPDES REGULATIONS. THE CONTRACTOR WILL BE RESPONSIBLE FOR SUBMITTING FDEP'S NOTICE ON INTENT (NOI) TO EPA FORTY-EIGHT (48) HOURS PRIOR TO COMMENCING CONSTRUCTION.
12. TEMPORARY SEEDING: AREAS OPENED BY CONSTRUCTION OPERATIONS AND THAT ARE NOT ANTICIPATED TO BE RE-EXCAVATED OR DRESSED AND RECEIVE FINAL GRASSING TREATMENT WITHIN 30 DAYS SHALL BE SEEDED WITH A QUICK GROWING GRASS SPECIES WHICH WILL PROVIDE AN EARLY COVER DURING THE SEASON IN WHICH IT IS PLANTED AND WILL NOT LATER COMPETE WITH THE PERMANENT GRASSING.
13. TEMPORARY SEEDING AND MULCHING: SLOPES STEEPER THAN 6:1 THAT FALL WITHIN THE CATEGORY ESTABLISHED IN PARAGRAPH 12 ABOVE, A SUFFICIENT AMOUNT OF MULCH MATERIAL SHALL BE CUT INTO THE SOIL OF THE SEEDED AREA ADEQUATE TO PREVENT MOVEMENT OF SEED AND MULCH.
14. TEMPORARY GRASSING: THE SEEDED OR SEEDED AND MULCHED AREA(S) SHALL BE ROLLED AND WATERED OR HYDROMULCHED OR OTHER SUITABLE METHODS IF REQUIRED TO ASSURE OPTIMUM GROWING CONDITIONS FOR THE ESTABLISHMENT OF A GOOD GRASS COVER. TEMPORARY GRASSING SHALL BE THE SAME MIX & AMOUNT REQUIRED FOR PERMANENT GRASSING IN THE CONTRACT SPECIFICATIONS.
15. TEMPORARY REGRASSING: IF, AFTER 14 DAYS FROM SEEDING, THE TEMPORARY GRASSED AREAS HAVE NOT ATTAINED A MINIMUM OF 75 PERCENT GOOD GRASS COVER, THE AREA WILL BE REWORKED AND ADDITIONAL SEED APPLIED SUFFICIENT TO ESTABLISH THE DESIRED VEGETATIVE COVER.
16. MAINTENANCE: ALL FEATURES OF THE PROJECT DESIGNED AND CONSTRUCTED TO PREVENT EROSION AND SEDIMENT SHALL BE MAINTAINED DURING THE LIFE OF THE CONSTRUCTION SO AS TO FUNCTION AS THEY WERE ORIGINALLY DESIGNED AND CONSTRUCTED.
17. PERMANENT EROSION CONTROL: THE EROSION CONTROL FACILITIES OF THE PROJECT SHOULD BE DESIGNED TO MINIMIZE THE IMPACT ON THE OFFSITE FACILITIES.
18. PERMANENT SEEDING: ALL AREAS WHICH HAVE BEEN DISTURBED BY CONSTRUCTION WILL, AS A MINIMUM, BE SEEDED. THE SEEDING MIX MUST PROVIDE BOTH LONG-TERM VEGETATION AND RAPID GROWTH SEASONAL VEGETATION. SLOPES STEEPER THAN 4:1 SHALL BE SEEDED AND MULCHED OR SODDED.

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Scale: As Shown  
Date: 3-5-2018  
Design: R.A.J.  
Drawn: J.J.D.  
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Approved: B.L.R.

No.	Date	Revision

HIGHLANDS COUNTY BCC  
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HIGHLANDS COUNTY

EROSION CONTROL  
DETAILS

Royal Consulting Services, Inc.  
211 West Warren Avenue  
Longwood, FL 32750  
(407) 831-5095 phone  
(407) 831-5095 fax  
www.royalconsulting.com  
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**For Review**  
03/05/2018 4:30:10 PM

Richard A. Jones, P.E.  
FL P.E. No. 31118

SHEET  
CD-12

No.	Date	Revision

HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPOUNDMENT DISTRICT  
 IMPOUNDMENT PHASE II  
 HIGHLANDS COUNTY  
 FLORIDA

PUMP STATION  
 ELECTRICAL DETAILS

Royal Consulting Services, Inc.  
 211 West Warren Avenue  
 Longwood, FL 32750  
 (407) 831-5095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290

**ABBREVIATIONS**

A	AMPERE	PLC	PROGRAMMABLE LOGIC CONTROLLER
/C	CONDUCTOR	PVC	RIGID SCH 40 PVC CONDUIT
CB	CIRCUIT BREAKER	RA	RIGID SCH 40 ALUMINUM
DIA	DIAMETER	RGS	RIGID GALVANIZED STEEL
GEC	GLADES ELECTRIC COOPERATIVE	RTU	REMOTE TELEMETRY UNIT
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	TC	TERMINAL CABINET
GND	GROUND	SE	SERVICE ENTRANCE
MAX	MAXIMUM	SH	SHIELDED
MB	MAIN BREAKER	SS	STAINLESS STEEL
MFR	MANUFACTURER	TYP	TYPICAL
MIN	MINIMUM	V	VOLTS
NEC	NATIONAL ELECTRICAL CODE	W	WATT/WIRE/WITH
NTS	NOT TO SCALE		

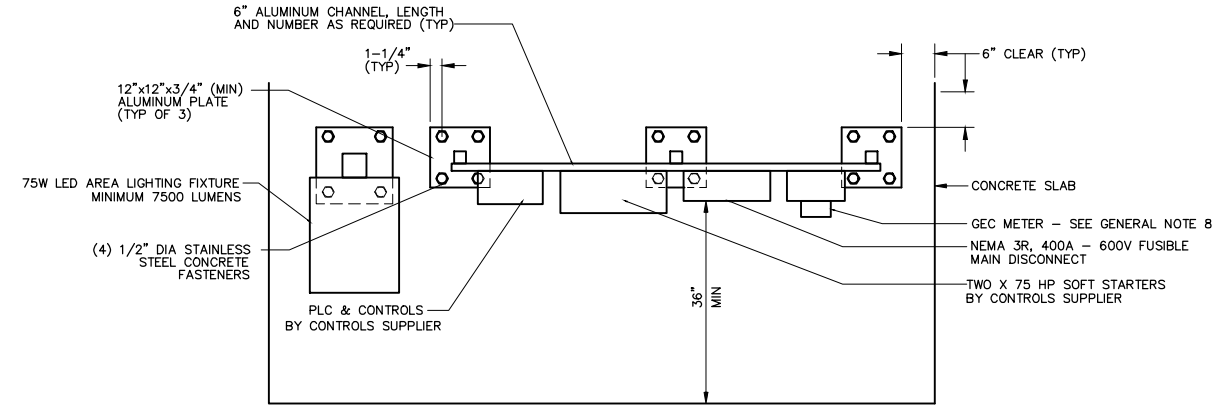
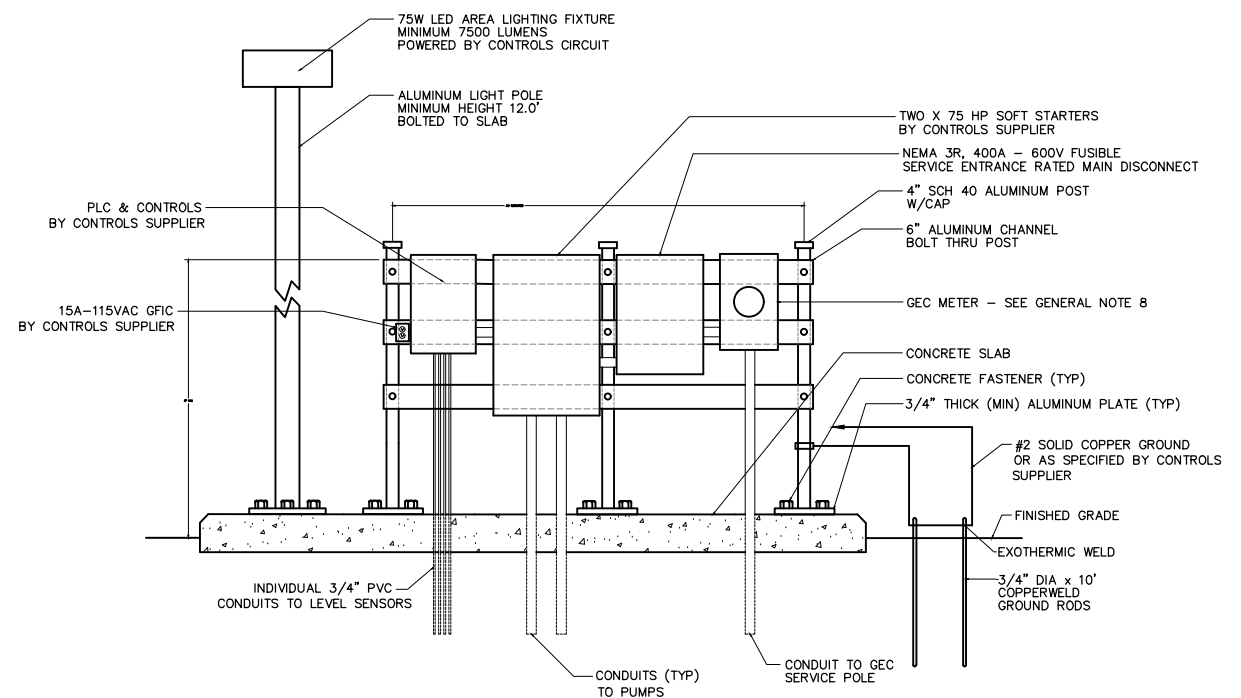
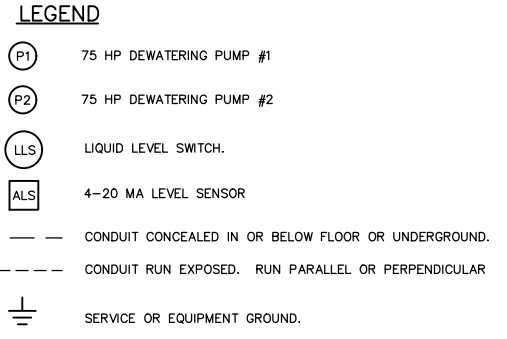
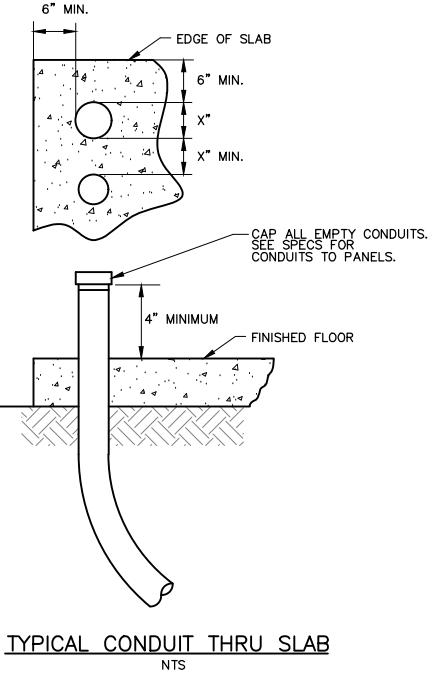
**GENERAL NOTES**

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH ALL LOCAL UTILITIES, AND TO MEET ALL OF THEIR INSTALLATION REQUIREMENTS. ALL LABOR, EQUIPMENT OR MATERIALS NECESSARY TO MEET THESE REQUIREMENTS IS TO BE INCLUDED IN THE PROPOSAL. THE CONTRACTOR SHALL OBTAIN, DELIVER AND INSTALL ALL CONDUITS, PULL-BOXES AND EQUIPMENT AS REQUIRED BY THE UTILITIES TO THEIR SPECIFICATIONS.
2. CONDUIT AND CONDUCTOR SIZES SPECIFIED ON THESE PLANS ARE FOR INFORMATIONAL AND BIDDING PURPOSES. THE INSTALLATION SHALL MEET ALL REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC) AND ALL CODES HAVING JURISDICTION.
3. AN EQUIPMENT GROUND WIRE SIZED PER THE NEC SHALL BE PULLED IN ALL ELECTRICAL CONDUITS, POWER & CONTROL, WHETHER OR NOT INDICATED ON PLANS.
4. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND UNUSED AND U.L. LISTED.
5. ALL EQUIPMENT FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE GUARANTEED AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE UNLESS OTHERWISE SPECIFIED.
6. DO NOT SCALE THE ELECTRICAL DRAWINGS. COORDINATE ALL EQUIPMENT LOCATIONS WITH THE ENGINEER AND MECHANICAL CONTRACTOR BEFORE ANY INSTALLATION. ALL EQUIPMENT DIMENSIONS AND CONDUIT OPENINGS SHALL BE VERIFIED WITH THE MANUFACTURER'S APPROVED SHOP DRAWINGS PRIOR TO FORMING CONCRETE WORK.
7. THE DRAWINGS ARE NOT INTENDED TO SHOW THE EXACT LOCATION OF EQUIPMENT OR CONDUIT RUNS. THESE ARE TO BE COORDINATED WITH THE OTHER TRADES SO THAT CONFLICTS ARE AVOIDED.
7. METER MAY BE LOCATED BY GEC AT PAD MOUNTED TRANSFORMER INSTEAD ON ELECTRIC RACK AS SHOWN.

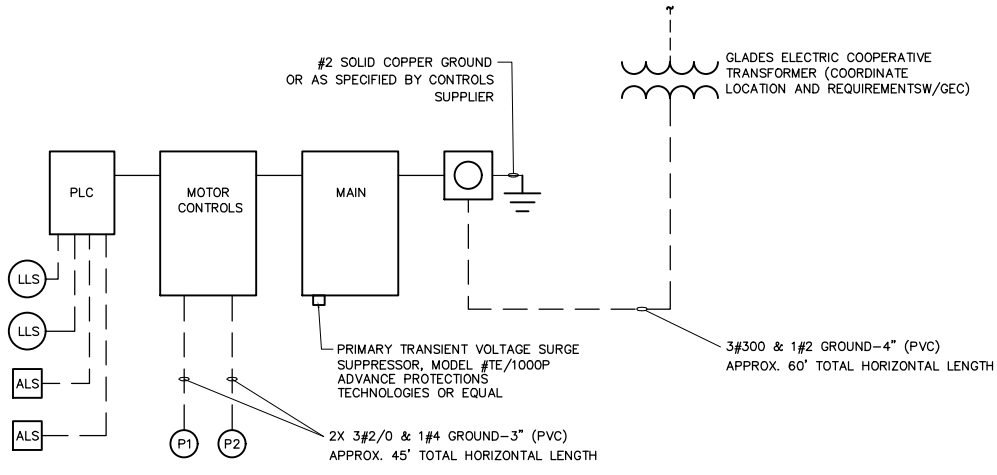
**ELECTRICAL SPECIFICATIONS**

1. ALL UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC. ABOVE GRADE CONDUIT SHALL BE SCHEDULE 80 PVC BEGINNING WITH THE UNDERGROUND ELBOW.
2. ALL WIRING SHALL BE COPPER, 600V, TYPE XHHW-2, UNLESS SPECIFIED ON PLANS.
3. FUSIBLE DISCONNECT SWITCHES SHALL BE HEAVY-DUTY, QUICK-MAKE, QUICK-BREAK, VISIBLE BLADES WITH FULL COVER INTERLOCK. ALL CURRENT CARRYING PARTS SHALL BE COPPER. ENCLOSURE TYPE SHALL BE NEMA-3R, PAINTED STEEL, WITH STAINLESS STEEL MOUNTING HARDWARE. DISCONNECT SWITCHES SHALL BE HORSEPOWER RATED AS MANUFACTURED BY THE SQUARE-D COMPANY, CLASS 3110, TYPE H, OR APPROVED EQUAL.
4. SURGE ARRESTORS SHALL BE INSTALLED WHERE REQUIRED. SURGE ARRESTORS SHALL BE AS MANUFACTURED BY THE GENERAL ELECTRIC COMPANY, TRANQUILL SERIES, MODEL 9L15 OR APPROVED EQUAL.
5. SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT AND MATERIALS.

LOAD CALCULATIONS			
LOAD	HP	FLA	NOTES
PUMP 1	75	96	NEC 430.250
PUMP 2	75	96	NEC 430.250
115 V CONTROLS	-	12	ESTIMATED
25% LARGEST MOTOR	-	24	
TOTAL	-	228	

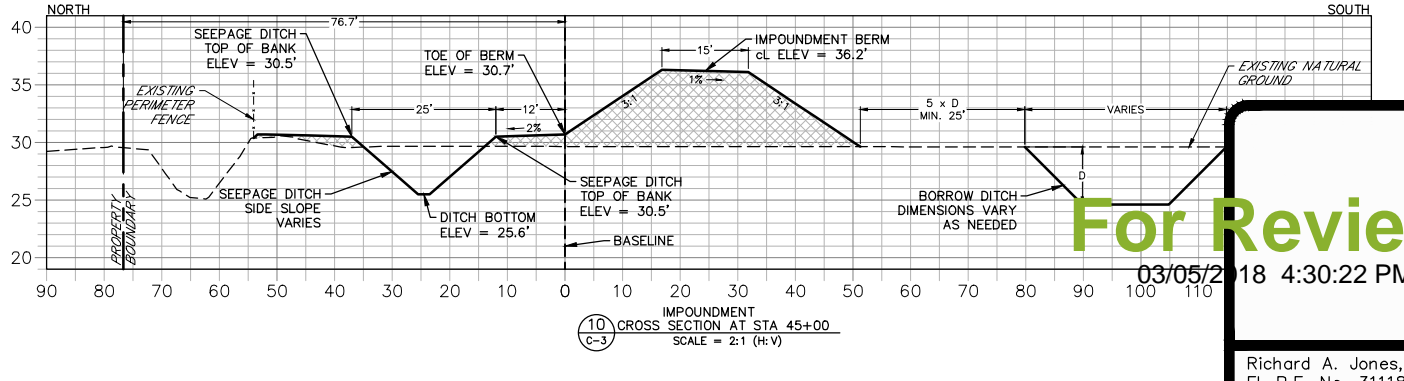
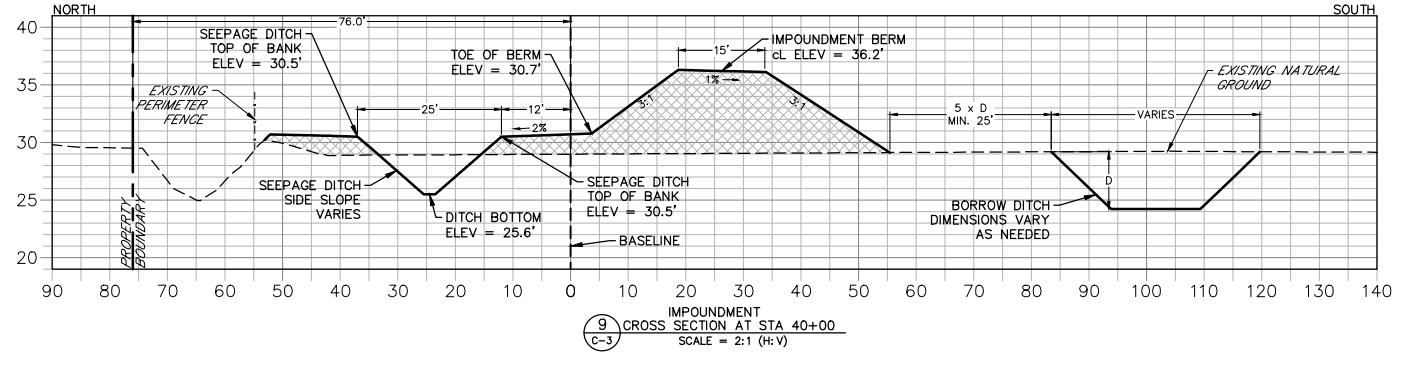
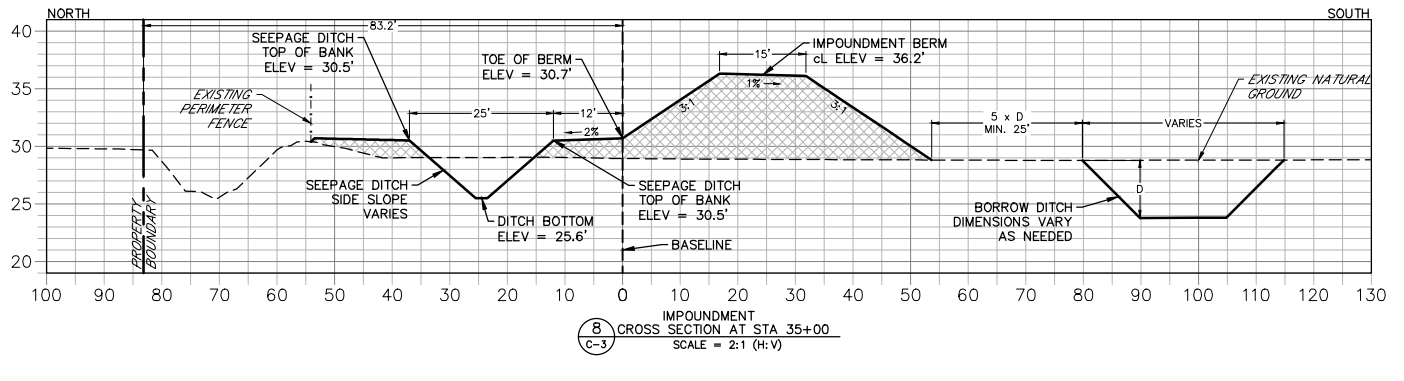
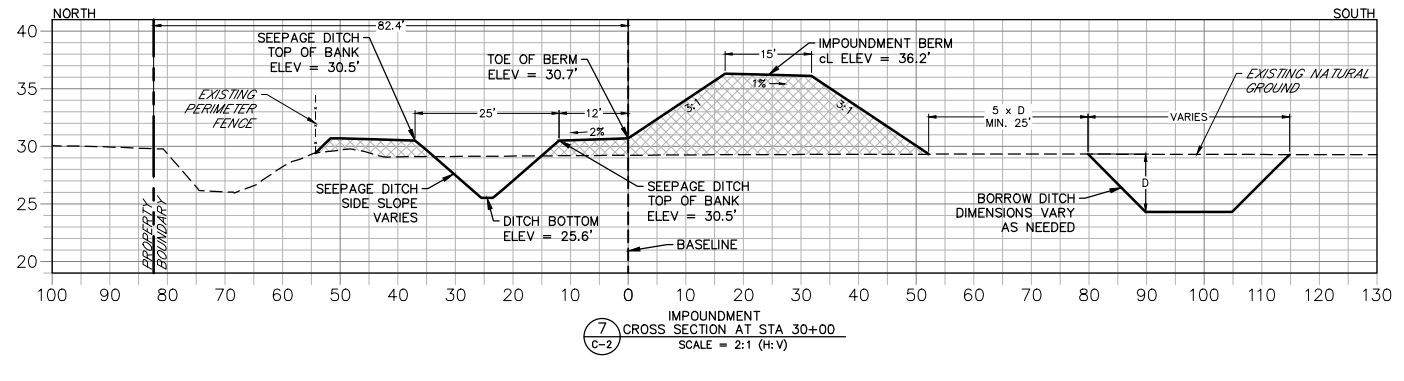
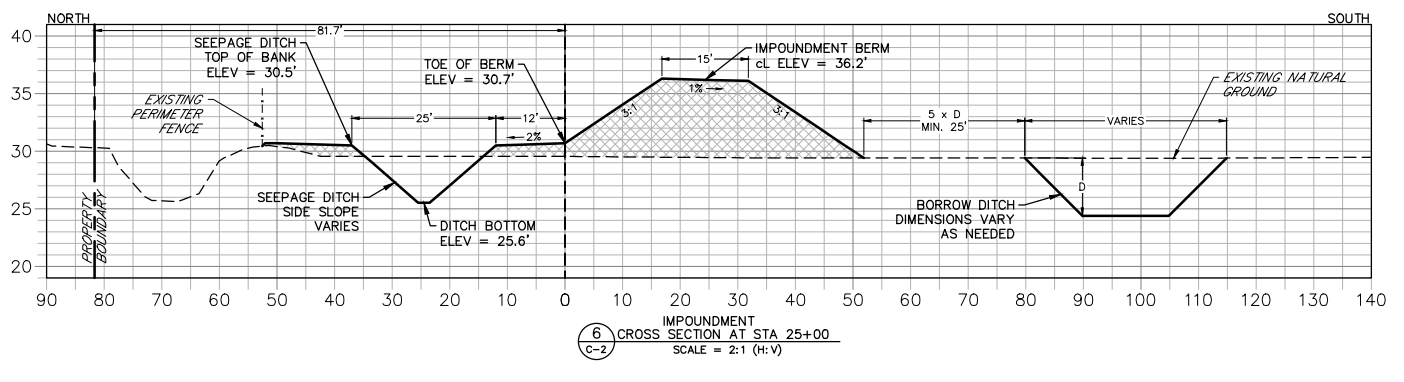
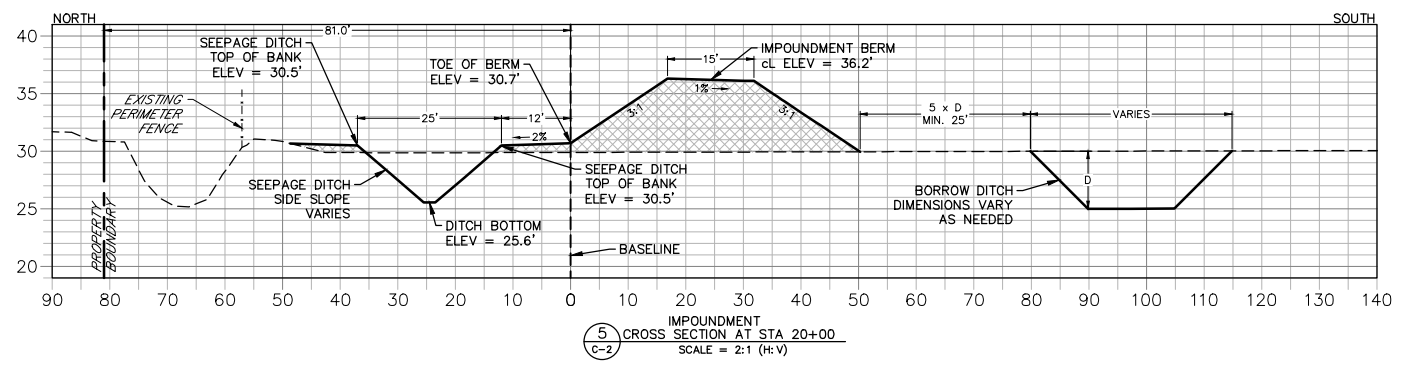
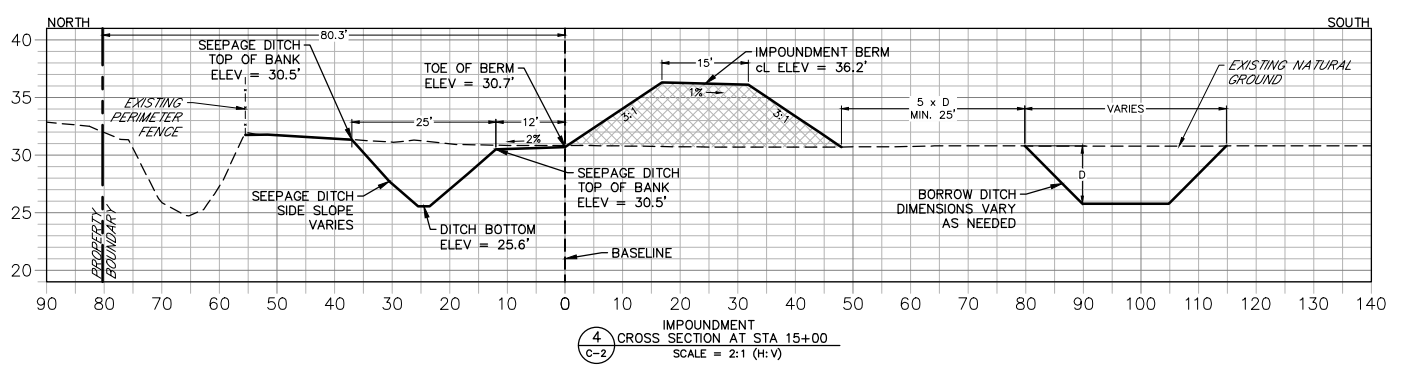
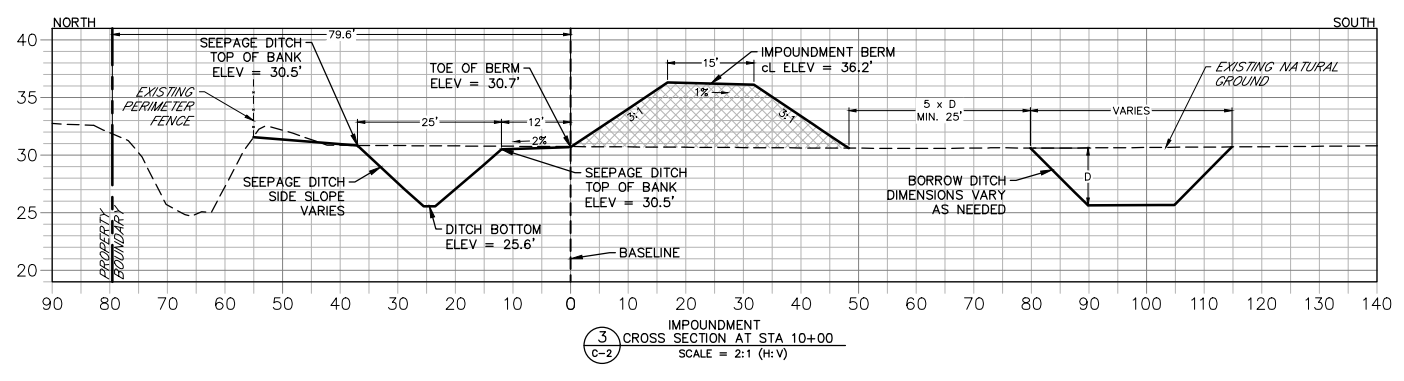
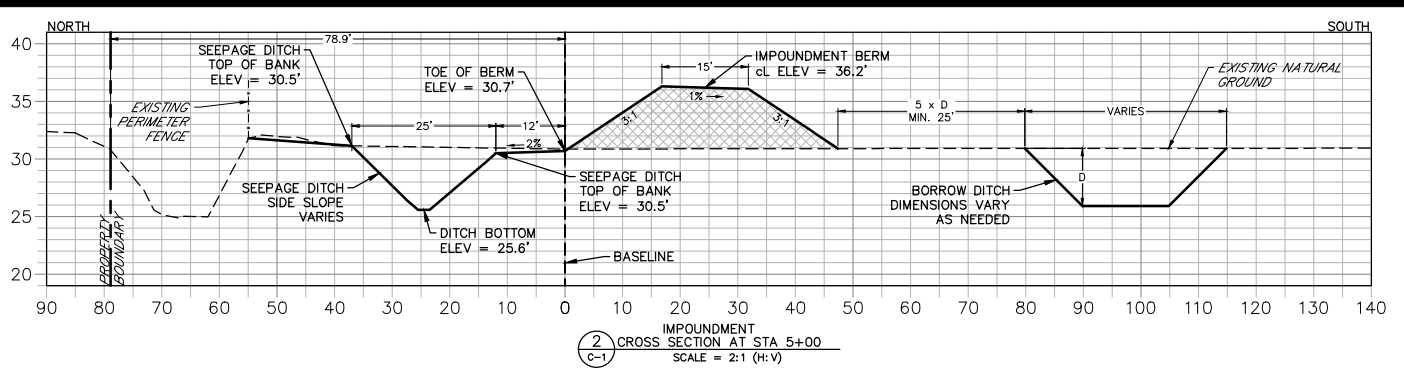
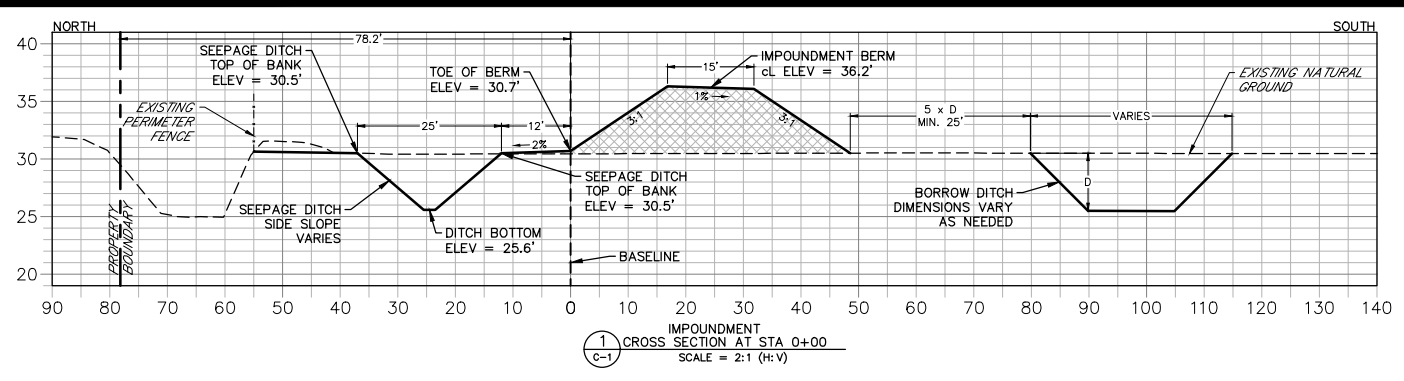


**NOTE:**  
 ALL MOUNTING HARDWARE SHALL BE 316 SS.



**For Review**  
 03/05/2018 4:30:16 PM





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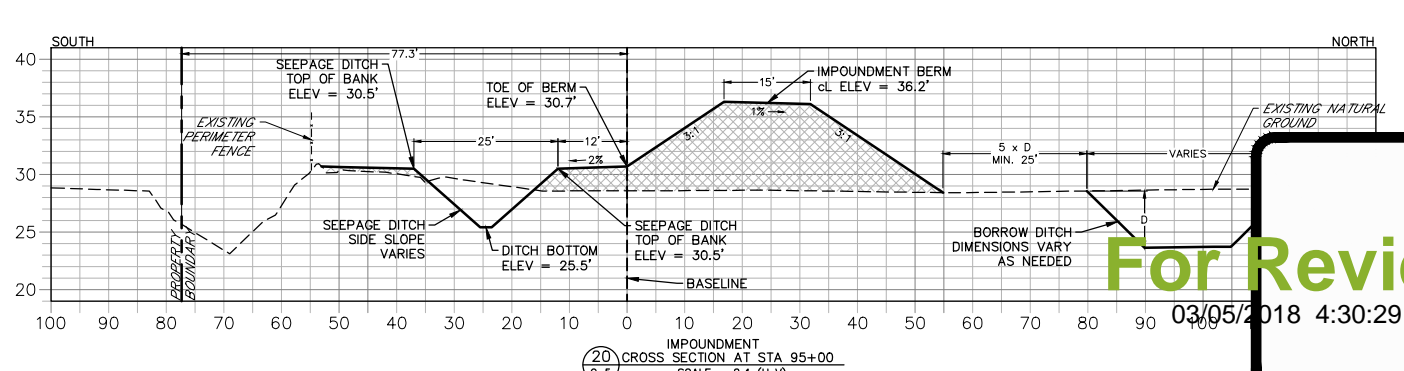
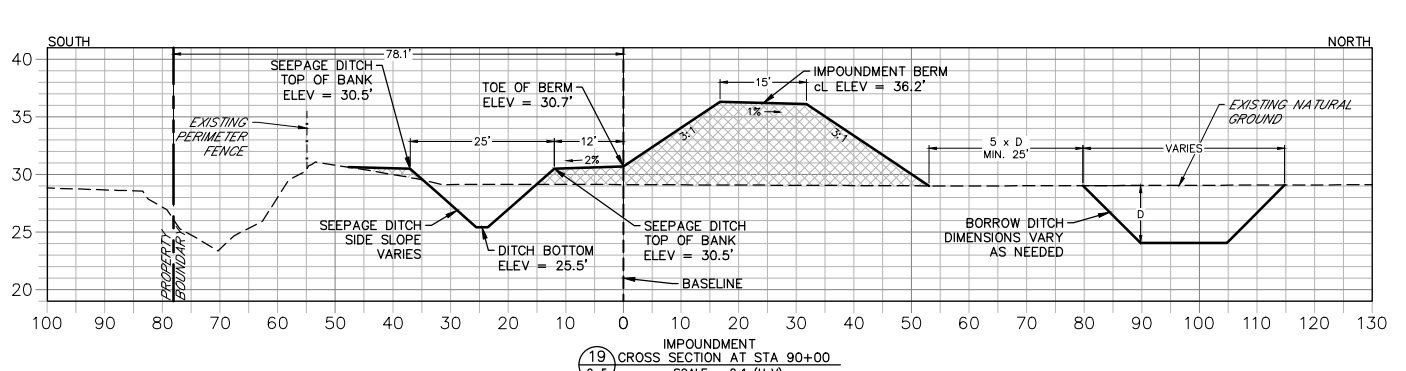
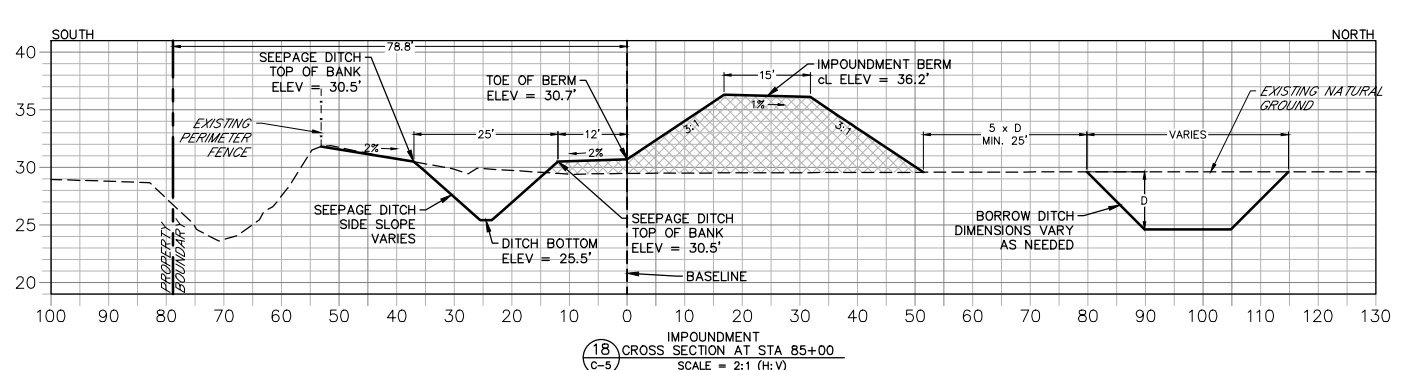
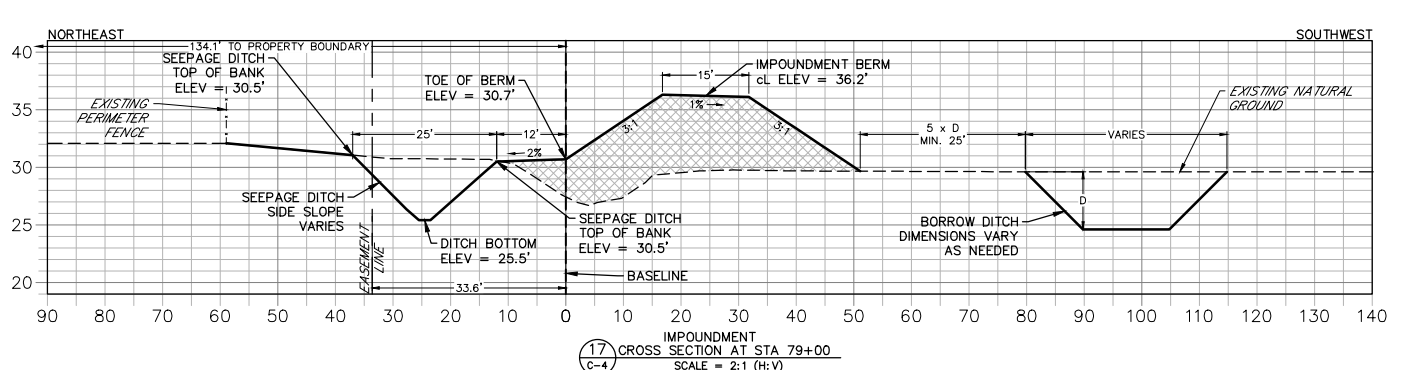
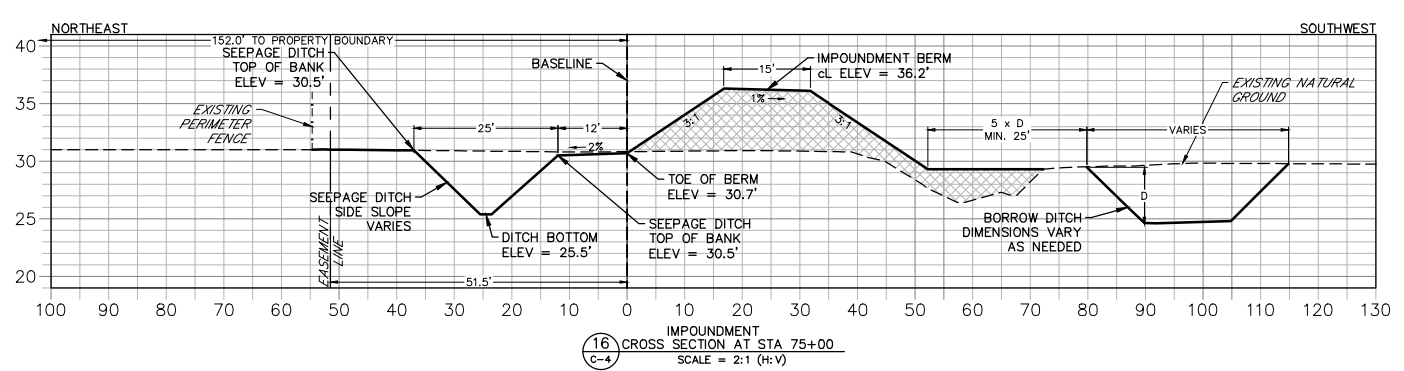
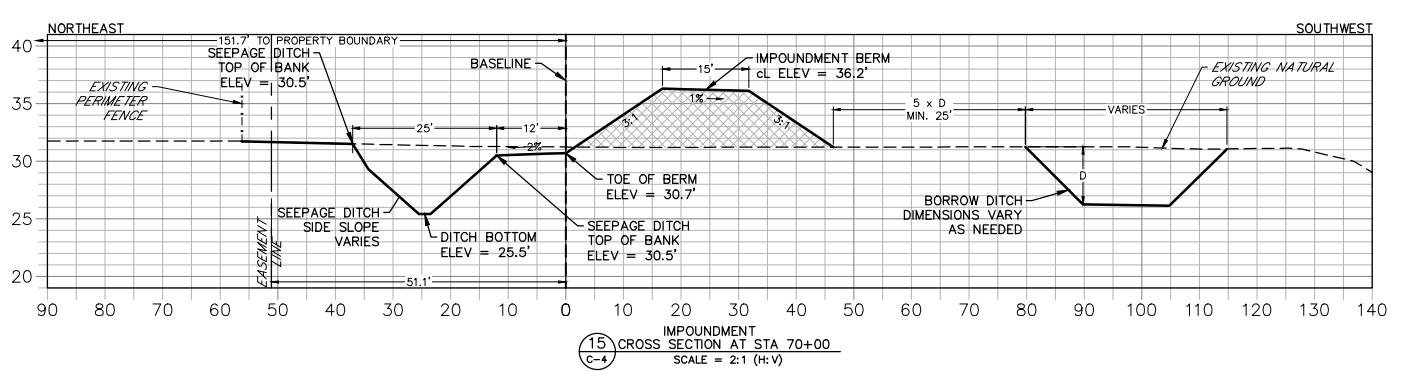
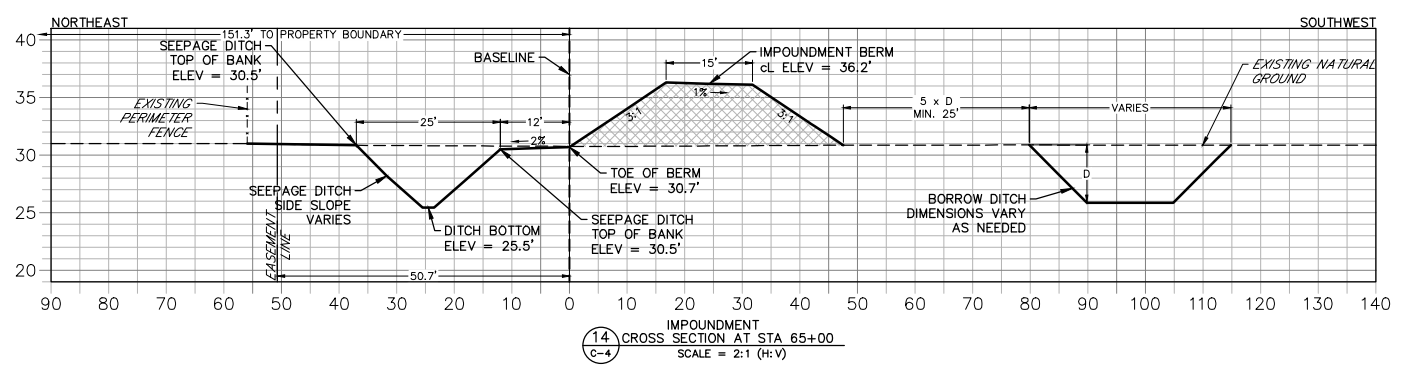
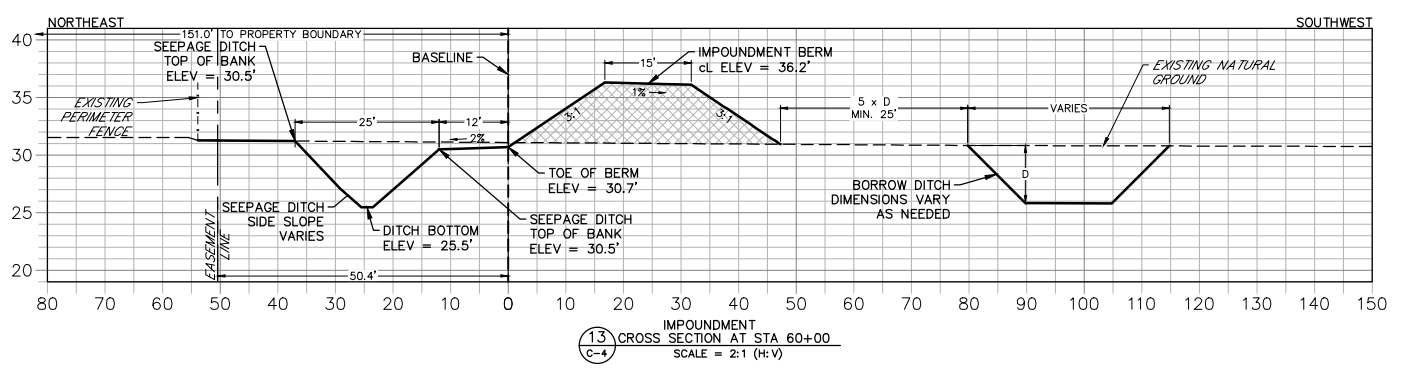
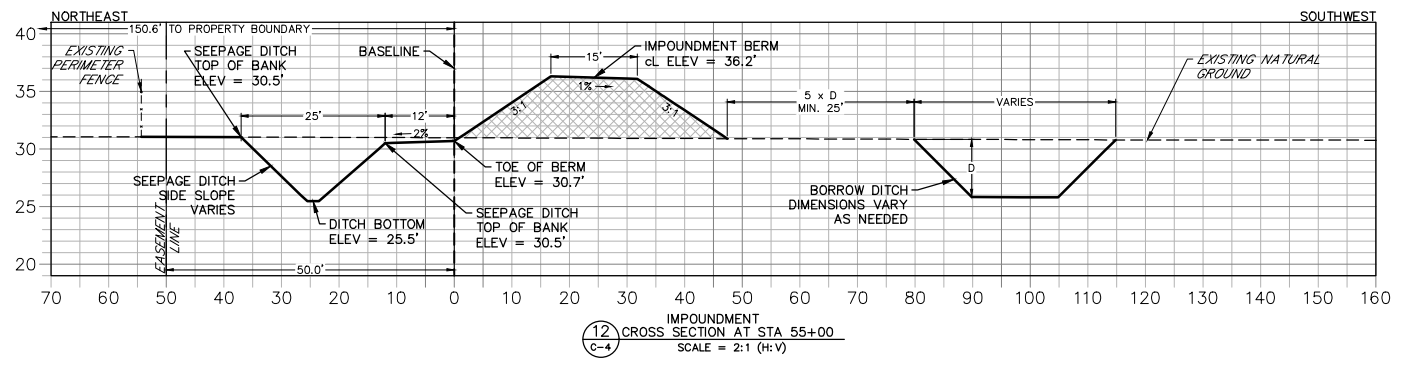
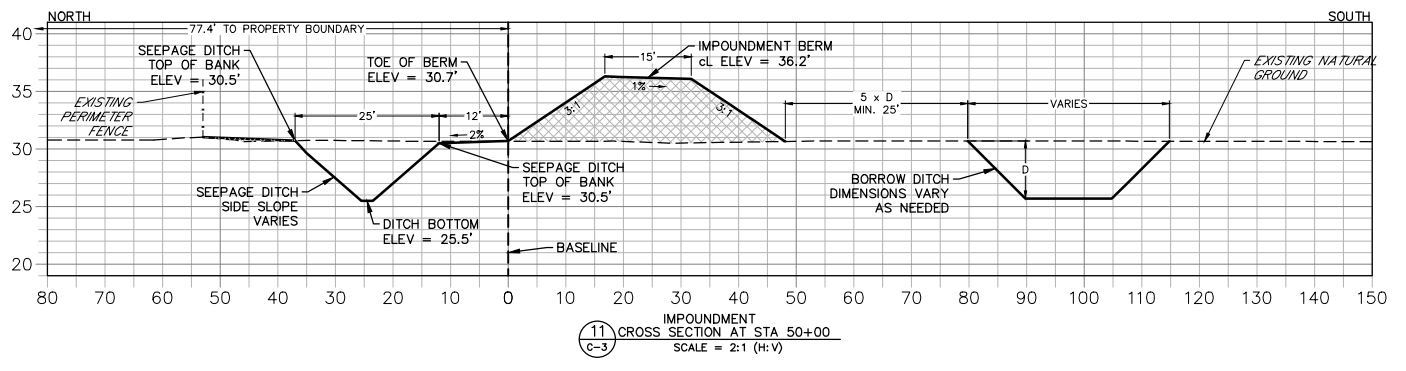
Richard A. Jones, P.E.  
 FL P.E. No. 31118

Job: 0202-02-ES  
 Scale: As Shown  
 Date: 3-5-2018  
 Design: R.A.J.  
 Drawn: J.J.D.  
 Checked: D.C.R.  
 Approved: B.L.R.

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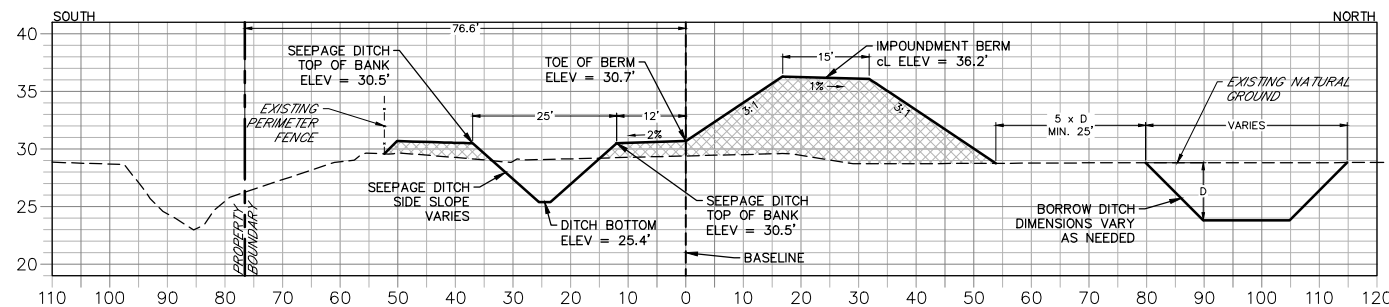


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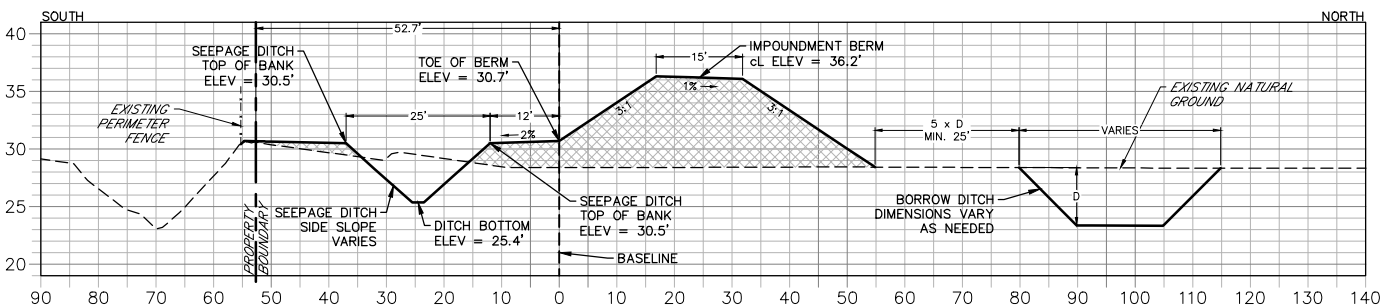
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SHEET  
 XS-2

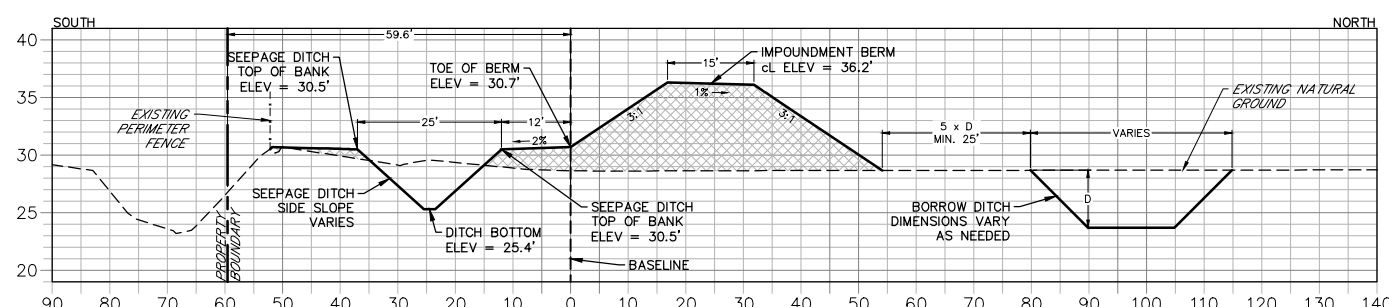




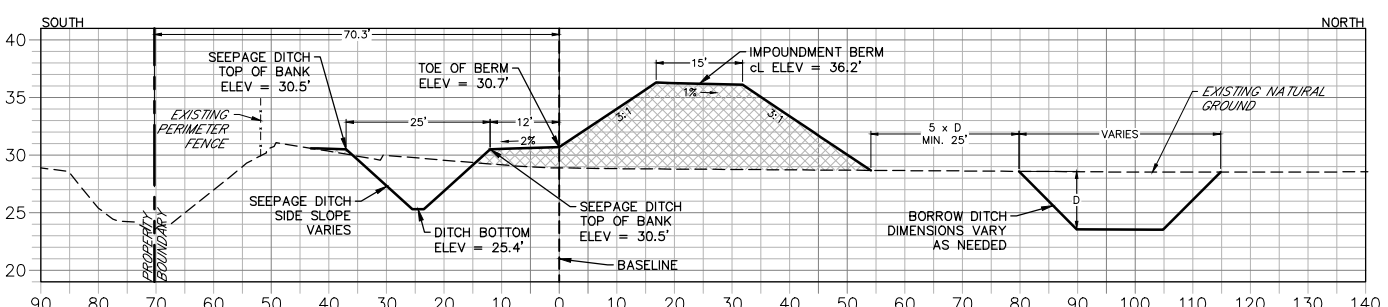
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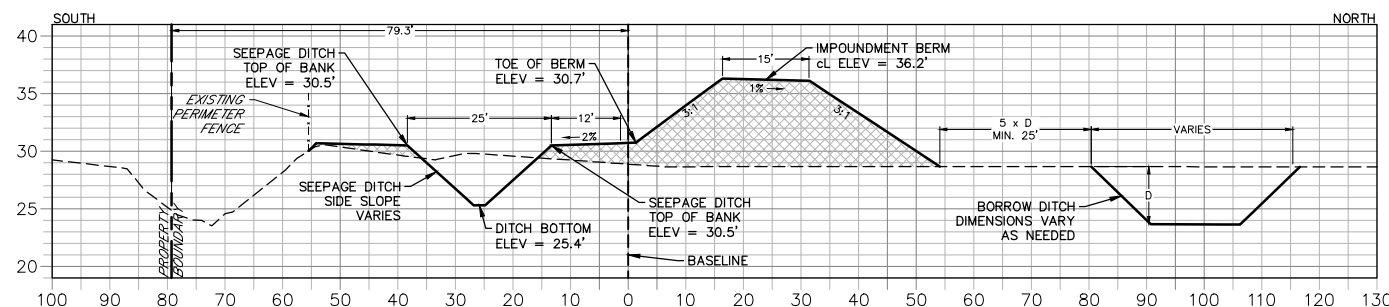
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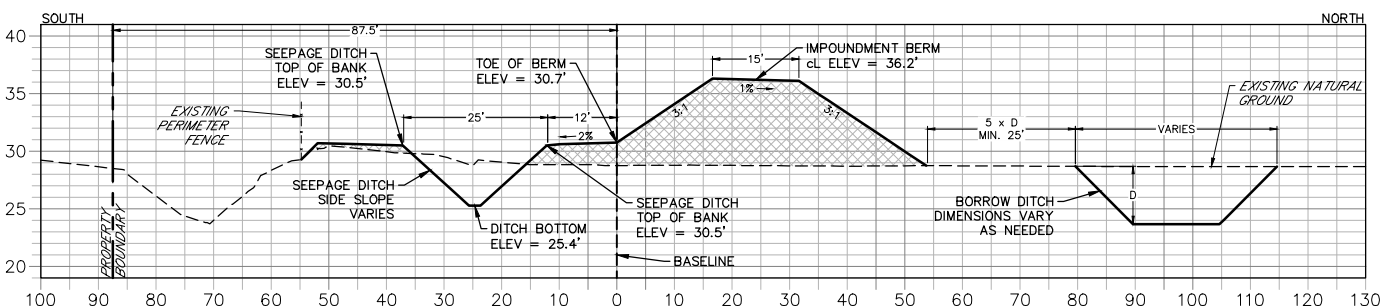
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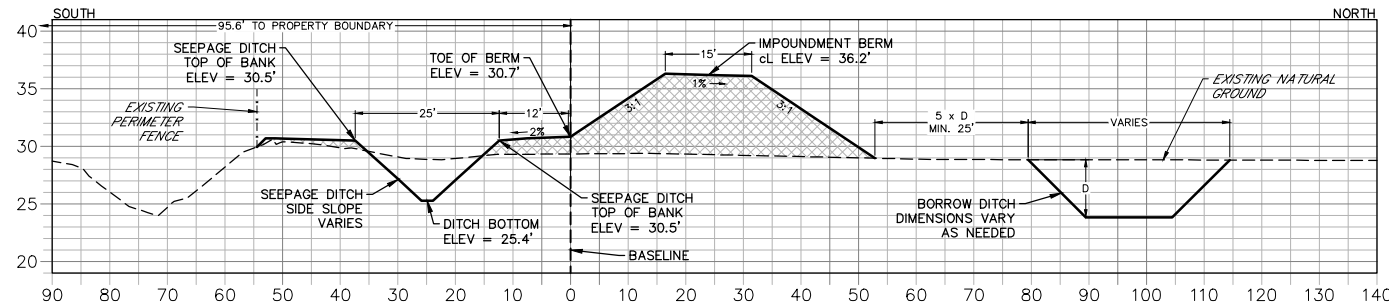
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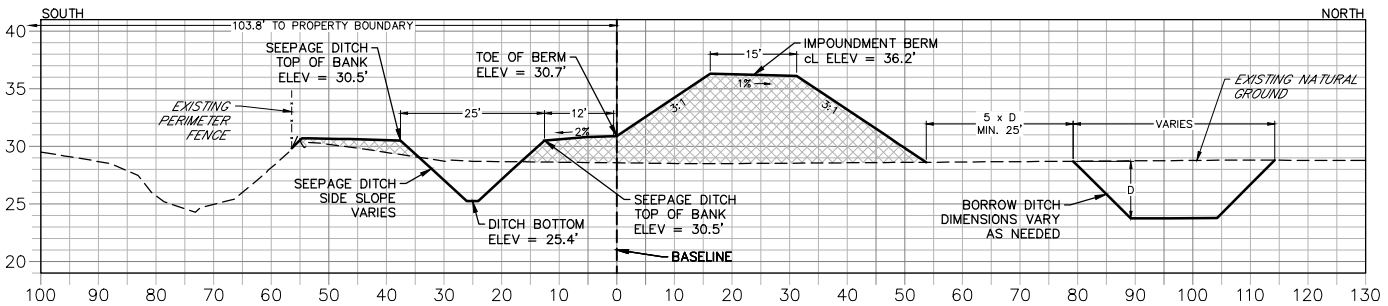
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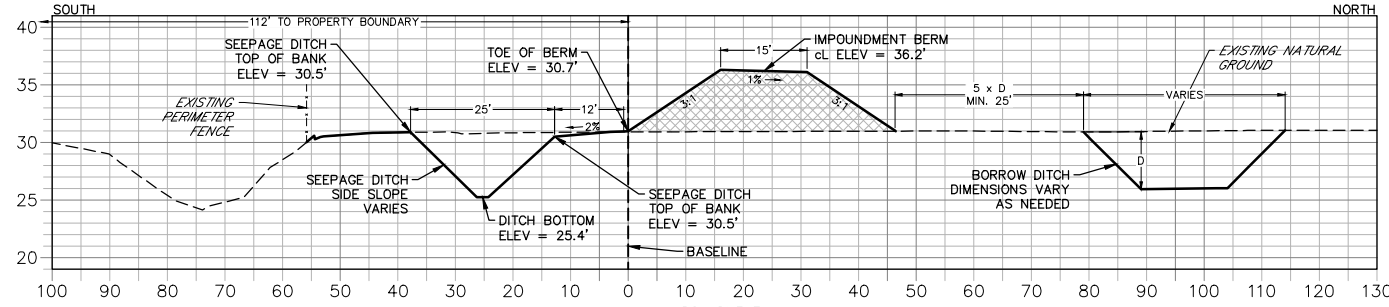
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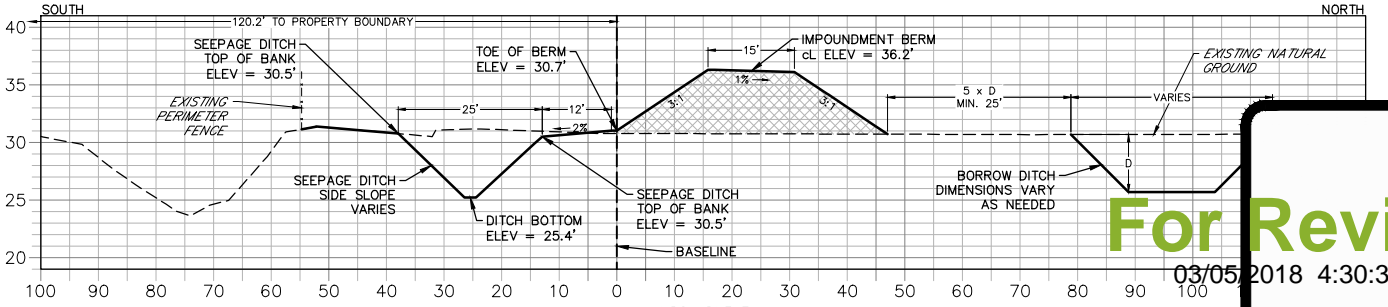
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28 CROSS SECTION AT STA 135+00  
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29 CROSS SECTION AT STA 140+00  
 C-7 SCALE = 2:1 (H:V)



30 CROSS SECTION AT STA 145+00  
 C-7 SCALE = 2:1 (H:V)

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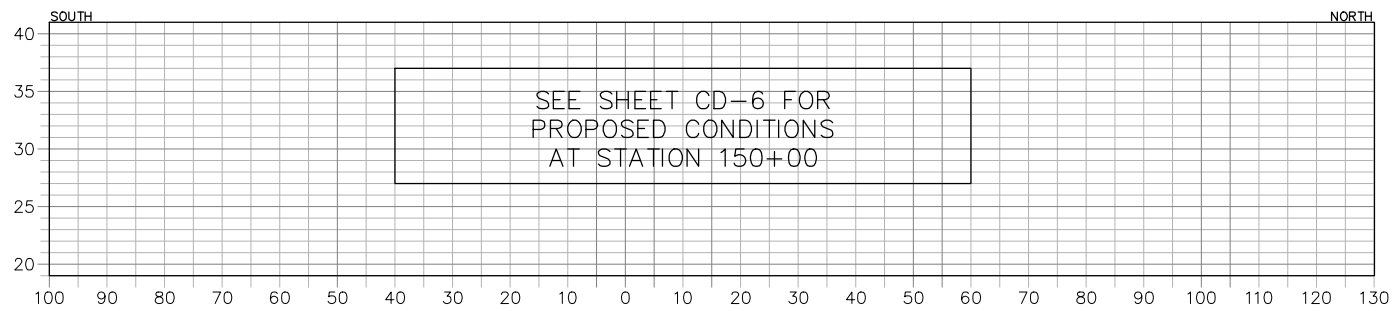
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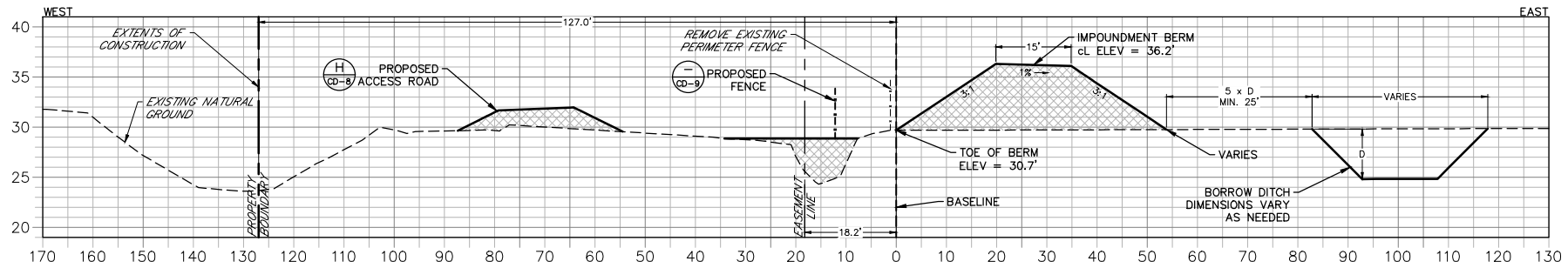
Richard A. Jones, P.E.  
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SHEET  
 XS-3

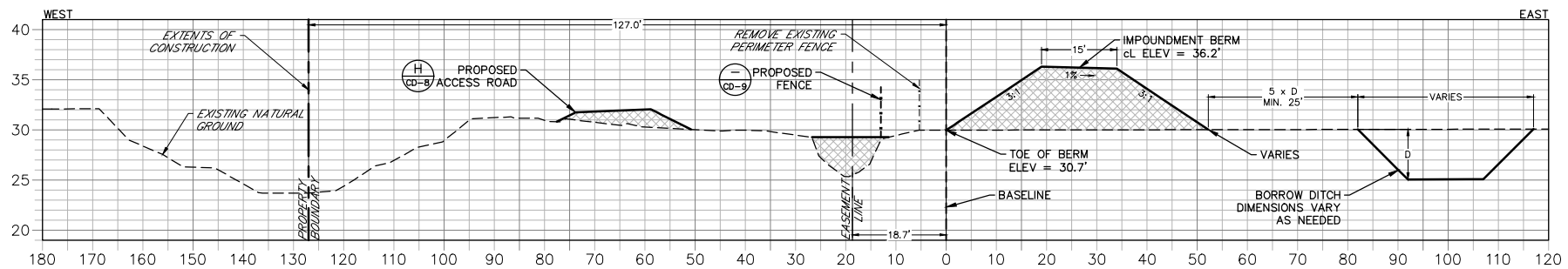




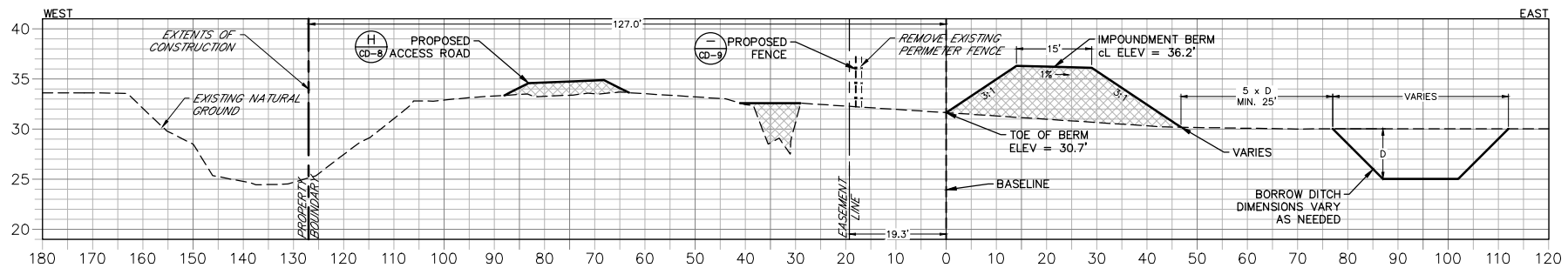
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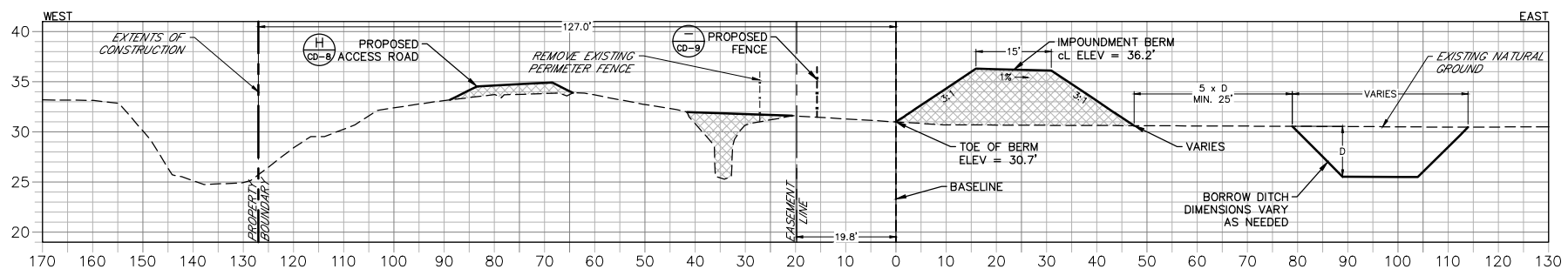
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SCALE = 2:1 (H:V)



35 CROSS SECTION AT STA 170+00  
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Job: 0202-02-ES  
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Drawn: J.J.D.  
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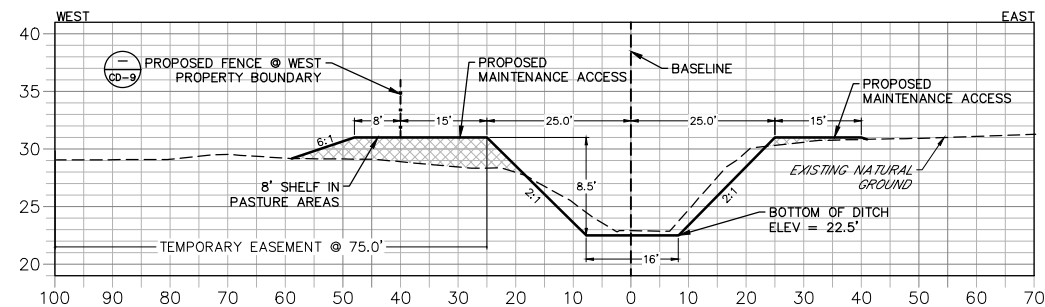
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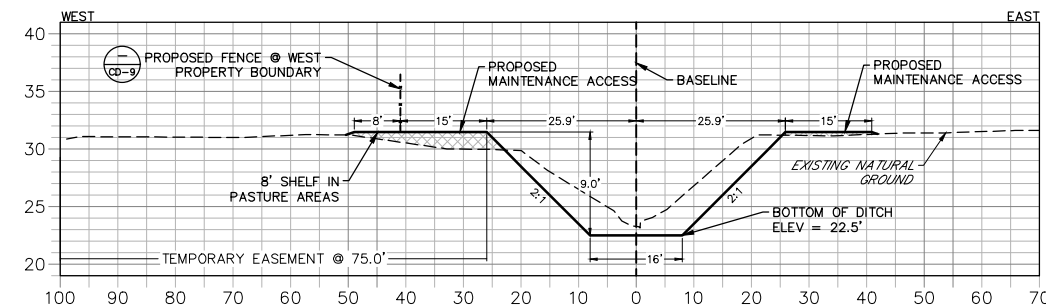
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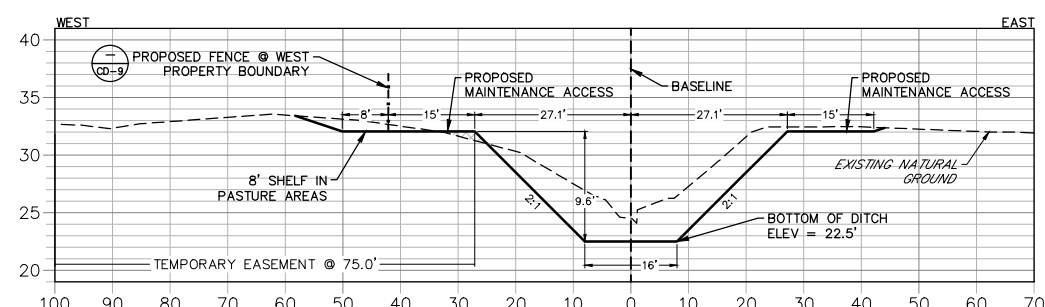
SHEET  
XS-4



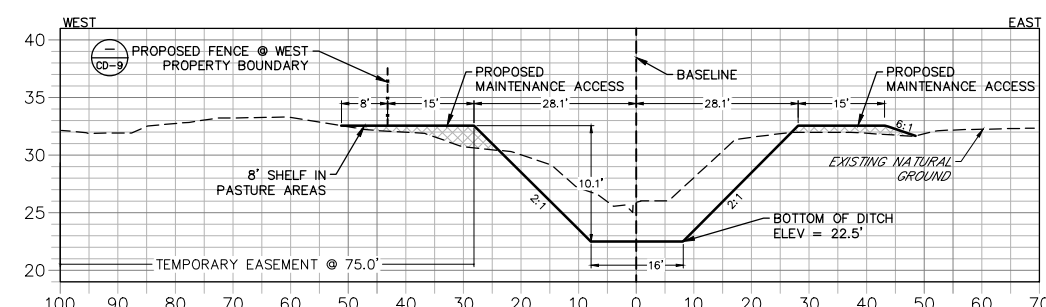
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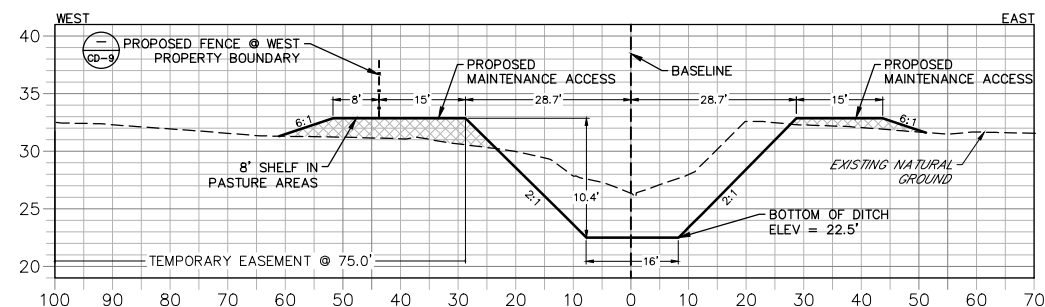
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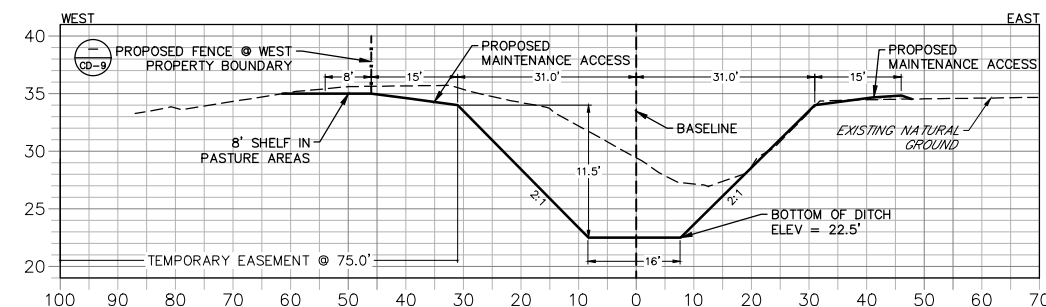
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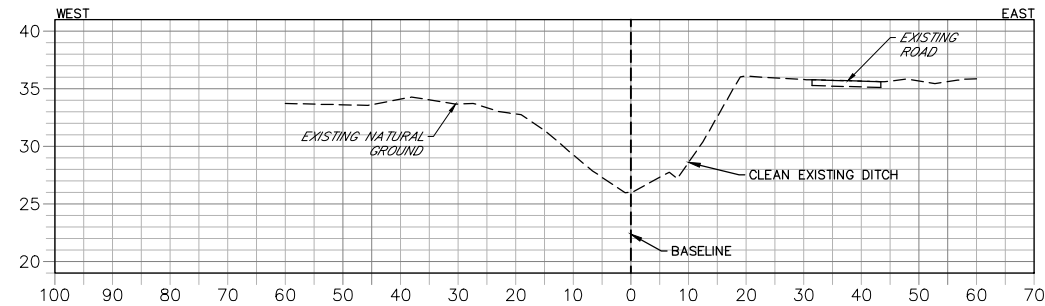
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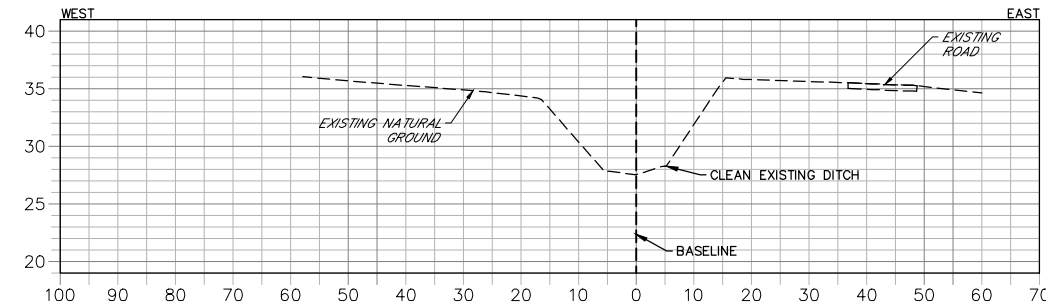
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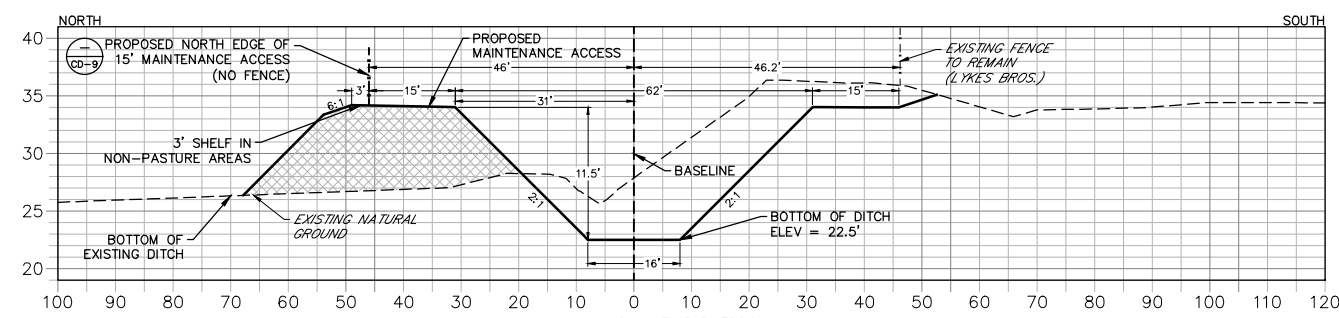
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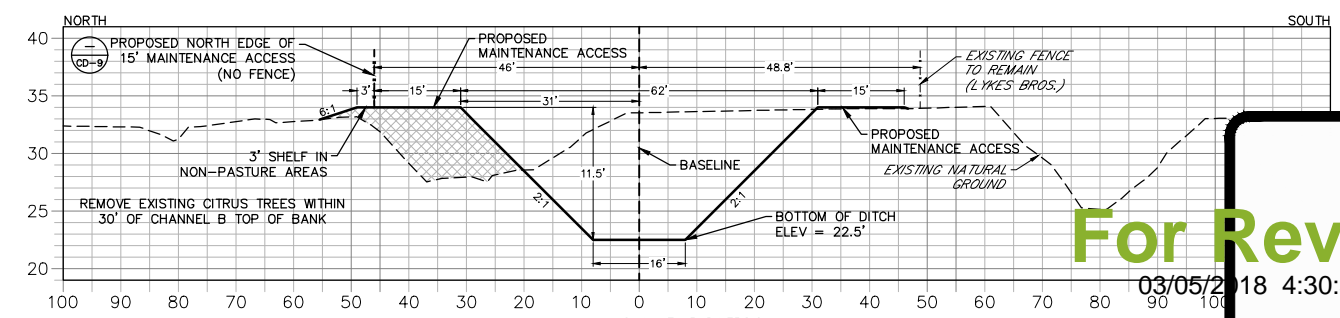
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44 CHANNEL B DIVERSION  
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SCALE = 2:1 (H:V)



45 CHANNEL B DIVERSION  
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SCALE = 2:1 (H:V)

For Review

03/05/2018 4:30:52 PM

Richard A. Jones, P.E.  
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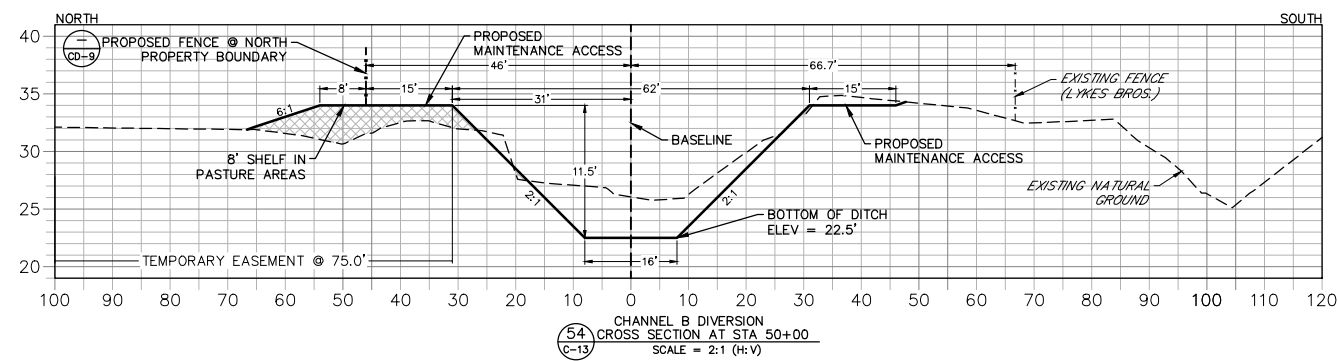
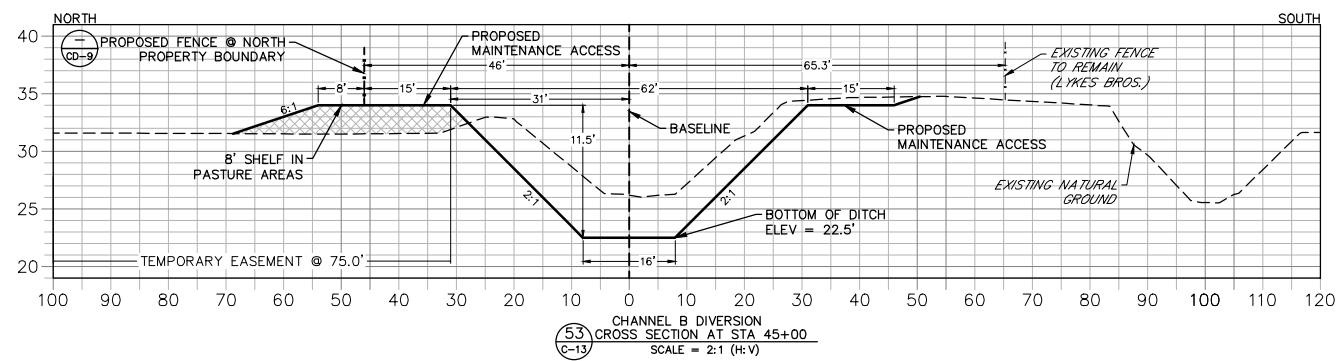
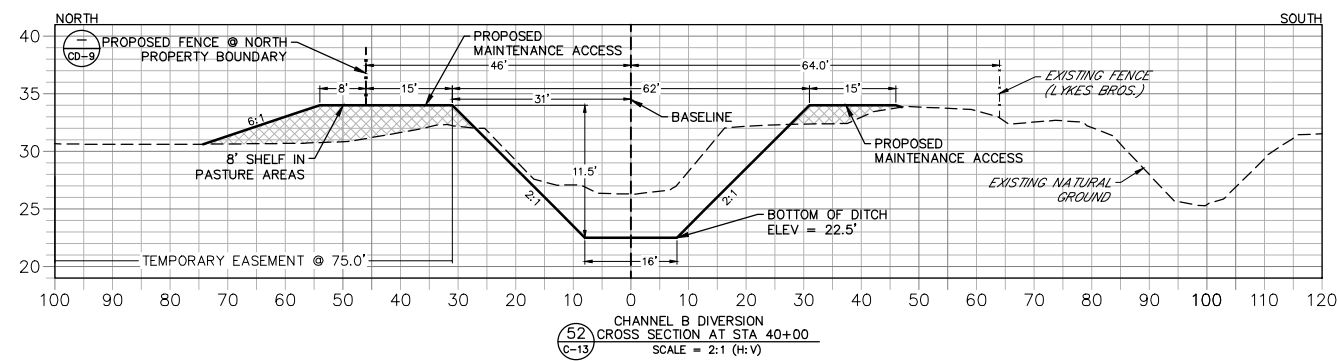
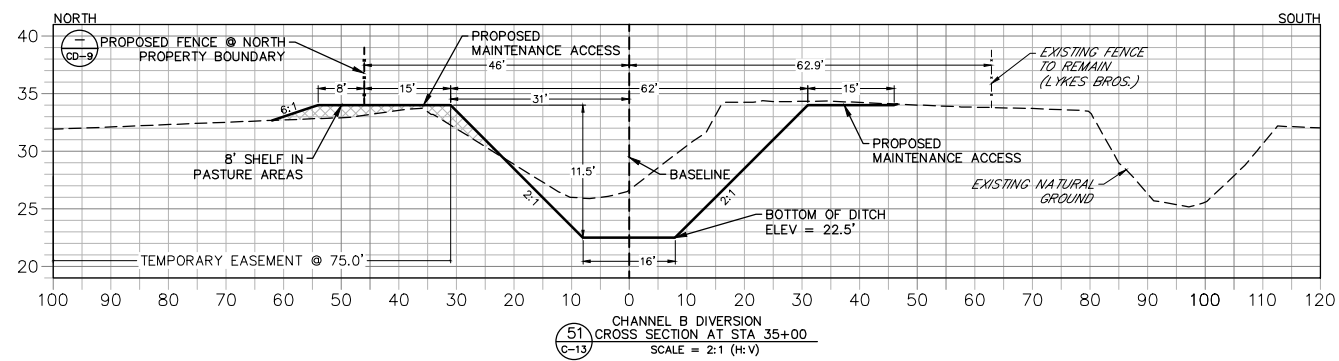
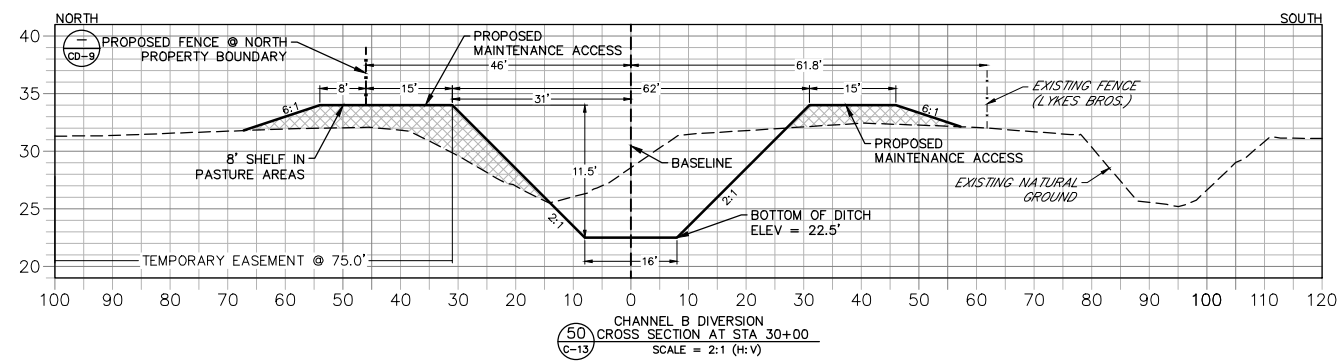
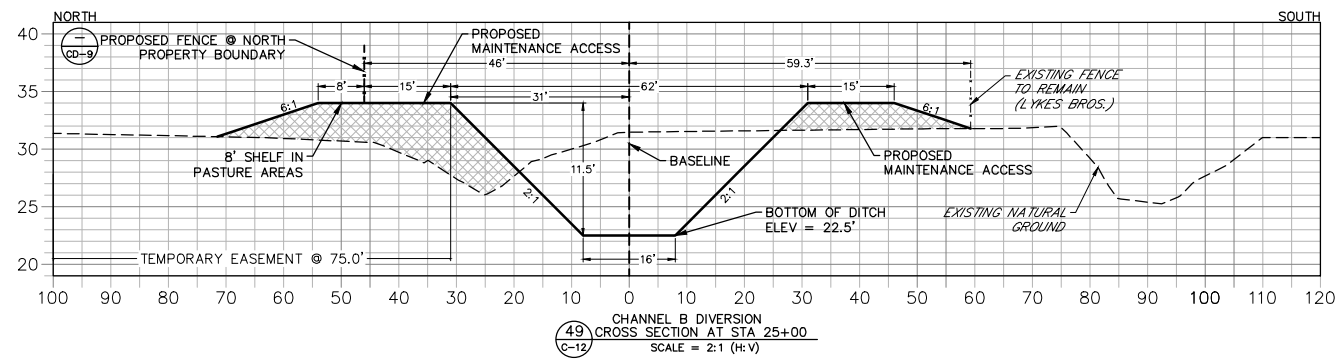
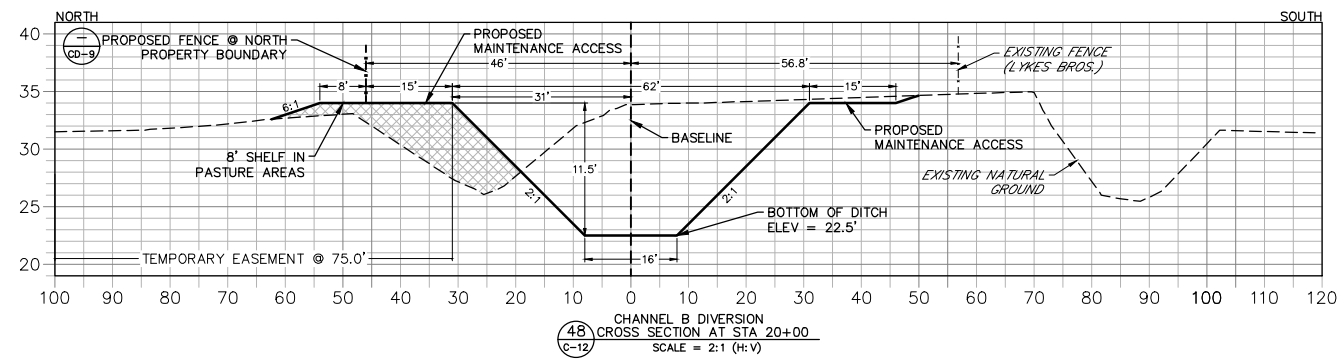
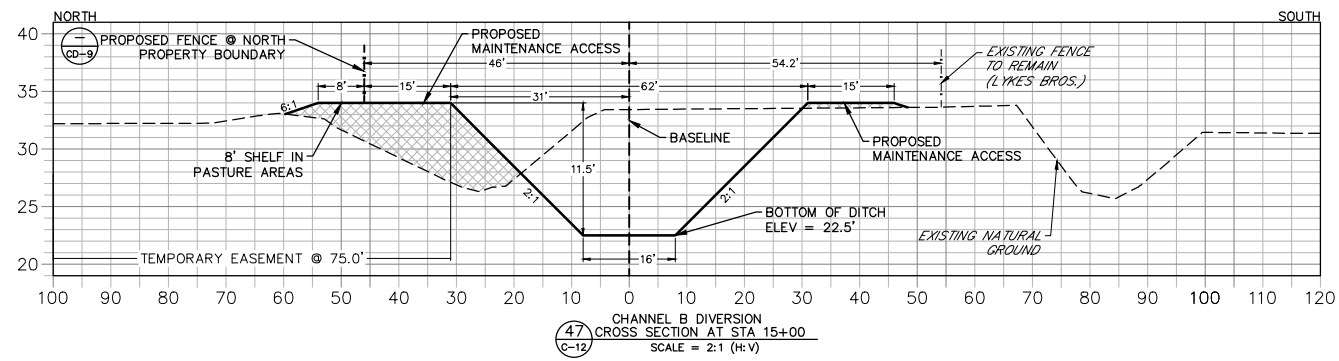
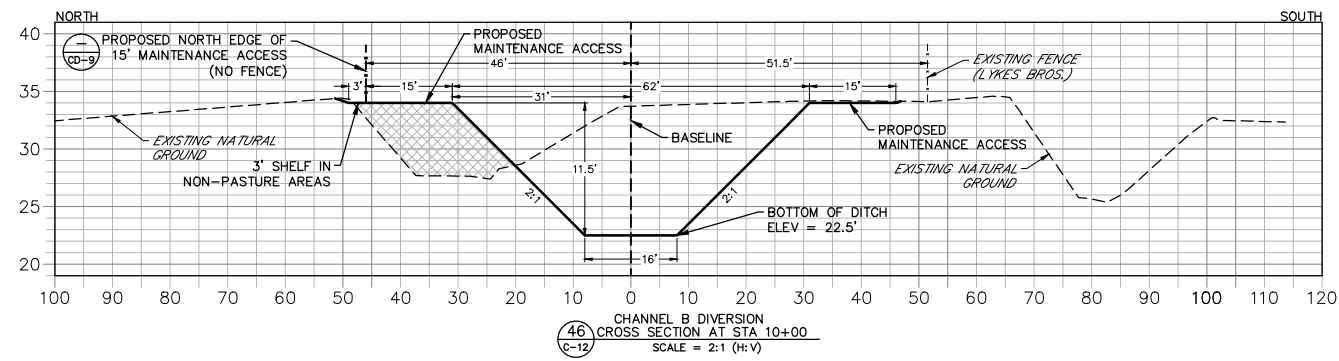
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Longwood, FL 32750  
(407) 831-5095 phone  
(407) 831-5095 fax  
www.royalconsulting.com  
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HIGHLANDS COUNTY BCC  
 ISTOKPOGA MARSH WATER  
 IMPROVEMENT DISTRICT  
 IMPROVEMENT PHASE II  
 HIGHLANDS COUNTY FLORIDA

CROSS SECTIONS

Royal Consulting Services, Inc.  
 211 West Warren Avenue  
 Longwood, FL 32750  
 (407) 831-3095 phone  
 (407) 831-5095 fax  
 www.royalconsulting.com  
 FL COA No. 7290

**For Review**  
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Richard A. Jones, P.E.  
 FL P.E. No. 31118

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