

**BIG BEND STATION  
COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
CLOSURE PLAN**

*Prepared for*

**Tampa Electric Company**  
13031 Wyandotte Rd.  
Gibsonton, Florida 33534



*Prepared by*

**Wood Environment & Infrastructure Solutions, Inc.**  
1101 Channelside Drive, Suite 200  
Tampa, Florida  
Florida Board of Professional Engineers Certificate of Authorization No. 5392

Wood Project No. 300996x1

October 2018

**CERTIFICATION**  
**Tampa**

Engineering Certification

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Wood Environment & Infrastructure Solutions, Inc., 1101 Channelside Drive, Suite 200, Tampa, FL 33602, a corporation authorized to operate as a business providing engineering consulting services (5392) by the State of Florida Department of Professional Regulation, Board of Engineers. I further certify that I, or others under my direct supervision, have prepared the geotechnical engineering evaluations, findings, opinions, calculations, conclusions or technical advice hereby represented in this report.

SIGNATURE: \_\_\_\_\_

NAME: Tanel Nuriye-Esin Andry, P.E.

LICENSE NO: 56775

Date: October 3, 2018

**Report Title:** Big Bend Station  
Coalfield Stormwater Runoff (Slag Settling) Pond  
Closure Plan

Tampa Electric Company

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## **1.0 INTRODUCTION**

Tampa Electric Company (TEC) is planning to excavate the existing coal combustion residual by-product slag from the pond formerly known as the West Slag Dewatering (and Settling) Pond at their Big Bend Station located at 13031 Wyandotte Road, Apollo Beach, Florida. This pond is now utilized as a stormwater pond for runoff from the Station's coalfield.

As part of this work, TEC intends to follow the general closure requirements of Part 257.102(c) of the Federal CCR rule 40 CFR Part 257 entitled "Disposal of Coal Combustion Residuals from Electric Utilities". TEC plans Closure by removal of the slag within the pond embankments to meet the intent of the requirements. After slag removal, the pond bottom will be raised to achieve separation from the groundwater and the pond will be lined to remain in use for stormwater runoff from the coal pile. This document presents the written closure plan for the removal of CCR and construction of a lined system and generally follows the requirements of 40 CFR Part 257.102(b). The proposed construction plans for the CCR removal and pond lining are included in Appendix A and a site location map and aerial views are presented in the construction plans.

## **2.0 SITE DESCRIPTION**

The CSRP is an approximately 3.5-acre unlined pond that was previously used as a disposal area for boiler slag from the burning of coal and was converted for use as a stormwater pond in 2009. The peninsula on which the Big Bend Station coal storage area and CSRP are located was constructed of reclaimed dredge spoils. The CSRP receives stormwater runoff from the coal storage area through a series of ditches. The East Coal Field Sump (ECFS) which contains three 2,000 gpm pumps is located on the southeast corner of the existing pond; discharging into the Economizer Ash & Pyrite (EAPP) Suction pond located in the southern portion of the site. The Suction Pond will be demolished and pipe discharges will be routed directly to the Long-Term Flash Stormwater Pond (LTFAP).

## **3.0 CLOSURE PLAN**

### **3.1 Project Description**

The existing pond will be removed from service during construction. This project will require removal of stormwater from the pond and dewatering to an elevation that allows for removal of the residual slag, and construction of a lined pond system to hold stormwater runoff generated from the coal storage area (coalfield) in the future. Wood Environment & Infrastructure Solutions, Inc. (Wood) has developed construction plans for implementation of the CSRP closure. The proposed construction plans are in **Appendix A**. The project will involve raising the pond bottom

from approximately elevation +3 ft to +4.5 ft using the TEC Plant Vertical Datum (Plant Datum) which will require modifications to the ECFS.

### **3.2 Closure Process**

The surface water in the existing pond will first be pumped out and temporary pumping equipment will be used to route stormwater directly into the ECFS. Dewatering will then be required to lower the groundwater 2 ft to 3 ft below the bottom of excavation (or to approximate elevation 0 ft to -1.0 ft., Plant Datum). Based on historical water table elevation data, this should allow removal of all slag and still leave separation between the bottom of the excavation and the groundwater to allow placement of new fill, however, special measures such as light weight equipment may be required to place the initial lifts.

Once the pond is dry and water diverted, the CCR (slag) throughout the pond will be removed and temporarily stockpiled in the coalfield to drain/dewater back into the perimeter coalfield ditch. Once the stockpiled slag has dried sufficiently, it will be hauled to a permitted off-site landfill facility for disposal. After removal of all slag, an additional one foot of soil will be excavated (to an approximate elevation of +2.0 feet TPD) from the pond bottom in preparation for backfilling to the final pond bottom elevation of approximately +4.5 feet, Plant Datum. Existing stormwater conveyance piping from the coalfield perimeter ditch to the CSRP (three 24-inch diameter and one 15-inch diameter RCP pipes) will also be removed and disposed of at an off-site landfill. Drainage from the coalfield ditch to the CSRP will be conveyed via a newly installed settling sump and weir at the pond's western edge. This sump has been designed to collect potential coal fines prior to the stormwater transference into the pond. The concrete sediment collection sump has been designed to allow TEC to routinely clean and remove the sediment. Stormwater will be conveyed into the sump from the existing ditch system and a proposed 24" diameter RCP under an existing ditch crossing adjacent to the sump. (Reference Drawings 349-FY-8AE, 349-FC-23AF, 349-FC-23AG, 349-FC-23AH) Stormwater will flow from the CSRP embankment through four (4) 24-inch HDPE DR-11 pipes. The pipe penetrations will be booted and welded to the HDPE liner lining the slopes of the pond.

Once the pond bottom and slopes have been verified to be clear of slag material (See Section 3.3 below), imported fill will be used to regrade the pond bottom and berms. The final pond shall consist of a minimum 15-foot-wide crest at a minimum elevation of +11 feet, Plant Datum. The interior slopes of the pond will be graded to a 3 horizontal to 1 vertical (3H:1V) slope. The pond floor is designed to be at an elevation of 4.5 feet, Plant Datum, or 1 foot above the design anticipated high groundwater elevation of +3.5 feet. After completion of grading to the design elevation, the pond will be lined with 80-mil (2mm) HDPE geomembrane liner.

(The intakes for the ECFS currently consist of three 3 ft by 3 ft square openings between elevation +3 ft and +6 ft, Plant Datum. The proposed pond bottom elevation of 4.5 ft would encroach on the bottom half of these openings. Therefore, a modification consisting of a concrete weir box will be attached to the wall of the sump to allow the existing openings to remain in their current configuration. Drawing 349-FC-23AE shows the details of the proposed sump modification.)

### **3.3 Confirmation of Removal**

Section 257.102(c) of the CCR Rule states: "*Closure by removal of CCR.* An owner or operator may elect to close a CCR unit by removing and decontaminating all areas affected by releases from the CCR unit. CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to § 257.95(h) for constituents listed in appendix IV to this part." As previously described in 3.2 above, TEC or its representative will inspect the bottom of pond prior to placement of new fill to confirm CCR removal. Confirmation of slag removal will be made visually. Post closure care for this facility will consist of stabilization of all disturbed areas by seeding or sodding.

### **3.4 CCR (slag) Quantity**

Wood used a survey of the pond together with results of soil testing to develop an opinion of probable volume of slag material to be removed. The existing pond bottom surface was based on a March 2017 site bathymetric survey performed by George F. Young, Inc. of St. Petersburg, FL. In April 2018, S&ME completed 35 vibracores and three standard penetration test (SPT) borings within the pond embankments. The April 2017 "Report of Geotechnical Engineering Services" by S&ME included logs of the borings documenting slag thicknesses encountered in each of the 38 borings.

Wood compiled the survey data together with the slag thicknesses to develop a bottom of CCR (slag) surface. The two surfaces (existing bottom and interpreted bottom of slag) imported into AutoCAD Civil 3D, and the volume of slag was calculated as the difference. Based on this information, a total slag volume of 11,500 cubic yards was calculated within the pond embankments. Additional material below the slag will likely be removed as part of the construction process. One additional foot of excavation would result in approximately 6,000 cubic yards of material. Given inherent uncertainties associated with the input information and calculation, we anticipate that the actual volume may vary from these estimates. Experience with estimating volumes based on boring data suggests a potential contingency of +/- 20 percent would be prudent. Note that this volume likely includes small pockets of accumulated pond

sediment and other non-slag material within irregularities at the interface of the slag and subsurface soils. Any such areas will be over excavated to ensure the removal of all CCR material from the pond bottom.

No information on the in-situ density or moisture content of the slag and non-slag materials to be excavated is available. Therefore, only a very approximate conversion of volume to weight can be made. We anticipate that the slag in the pond was placed without compaction and is, therefore, in a relatively loose or low-density condition that may approximate the loose density it will have during transport. The moisture content during transport will impact the weight for hauling. Therefore, the material will be stacked within the coalfield and drained sufficiently to allow for proper loading and transport to the landfill.

### **3.5 Pond Capacity**

The proposed construction will include raising the bottom of pond elevation from approximately 3.0 ft. to 4.5 ft. (Plant Datum). The perimeter berms will also be raised from minimum elevation +9.6 ft. to +11 ft. (Plant Datum). The existing pond capacity was calculated by assuming a minimum freeboard of 2 feet below the lowest point of the existing embankments, with an assumed maximum water level within the existing pond of elevation 7.6 ft. Based on these criteria, the existing pond was estimated to have a storage capacity of 5.1 million gallons (MG). With the berms at elevation +11 ft, the assumed maximum water level for the proposed pond configuration is assumed to be elevation 9 ft. Based on these criteria, the proposed pond capacity is estimated to be 5.3 MG.

The increase in pond capacity can be attributed to the design increase in crest elevation for the pond embankments.

### **3.6 Project Schedule**

Based on the proposed construction plans, construction of the project is estimated to take four months to complete. No contingencies were taken into consideration for weather related delays. Based on a "Dewatering Plan Evaluation" completed by Wood (under the predecessor name of Amec Foster Wheeler) in August 2017, it is recommended this work take place during the "Dry" season (November to April). Therefore, the project is expected to commence in November 2018 and to be complete by March 1, 2019. Post closure care will commence immediately upon construction completion and groundwater monitoring will commence on April 1, 2019. Groundwater monitoring will be performed semi-annually for two years to verify that groundwater protection standards have been met, as required by Part 257.102(c).

#### **4.0 STORMWATER MANAGEMENT**

Tampa Electric will submit a Notice of Intent to Use NPDES Generic Permit For Stormwater Discharge From Large And Small Construction Activities at least 72 hours prior to project initiation. TEC's contractor will certify conformance with the permit and the Stormwater Pollution Prevention Plan (SWP3) for the project. The SWP3 will specify the siltation controls and measures to prevent offsite siltation from the project. These may include siltscreens, hay bales, trackout pads or other measures to prevent escape of silt from the site. A Notice of Termination will also be submitted at the end of the project upon completion of site stabilization.

#### **5.0 REFERENCES**

Amec Foster Wheeler, "Big Bend Station West Slag Dewatering Pond Dewatering Plan Evaluation," August 2017.

Amec Foster Wheeler, "Design Basis Letter – Big Bend Station West Slag Dewatering Pond Lining Project," June 14, 2017.

George F. Young, Inc., "Tampa Electric Company – Old West Slag Dewatering Pond/Coalfield Runoff Pond Topography/Hydrographic Survey," March 2017.

S&ME, "Report of Geotechnical Engineering Services - West Slag Dewatering Pond Sampling – Big Bend Generating Station," April 28, 2017.

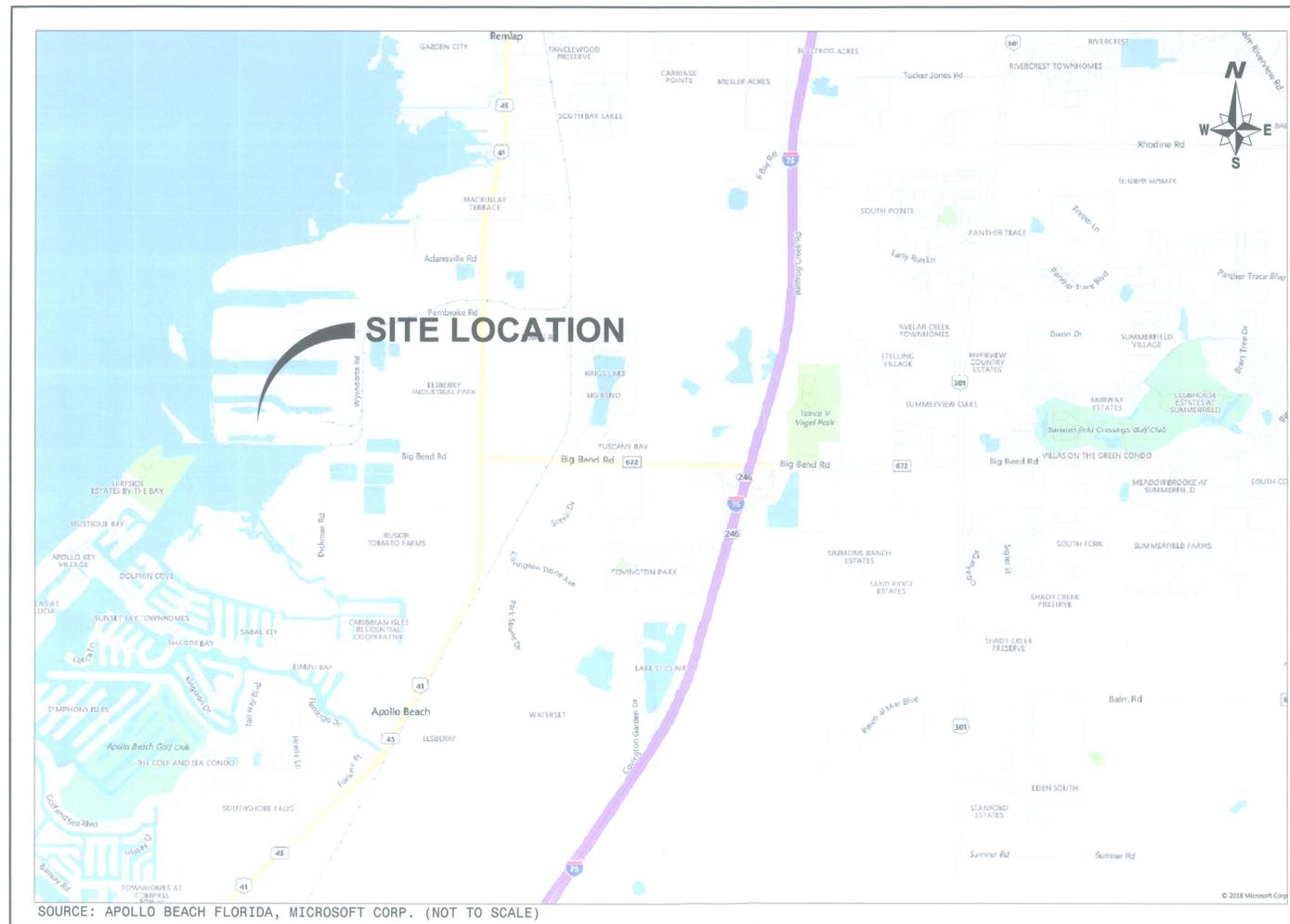
# **APPENDIX A**

Proposed Construction Plans

# CONSTRUCTION PLANS FOR: TAMPA ELECTRIC COMPANY BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND

## TAMPA, HILLSBOROUGH COUNTY, FLORIDA ISSUED FOR CONSTRUCTION

AMEC PROJECT NUMBER: 300996x1  
June 20, 2018



### S I T E   L O C A T I O N   M A P

HILLSBOROUGH COUNTY, FLORIDA  
SECTION 9, TOWNSHIP 31 SOUTH, RANGE 19 EAST

INDEX OF DRAWINGS	
SHEET NUMBER	TITLE
349-FY-8AB	COVER SHEET
349-FY-8AC	GENERAL NOTES
349-FY-8AD	OVERALL SITE PLAN
349-FY-8AE	EXISTING & PROPOSED SITE LAYOUT
349-FY-8AF	PROFILE VIEWS
349-FC-23AE	LINER AND INSTALLATION DETAILS
349-FC-23AF	CONCRETE SUMP (1 OF 2)
349-FC-23AG	CONCRETE SUMP (2 OF 2)
349-FC-23AH	CONCRETE SUMP DETAILS
349-FC-23AI	GUARDRAIL DETAILS

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

CONTRACTOR IS TO VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

**NOTE:**  
CONSTRUCTION PLANS ARE AVAILABLE IN AUTODESK CIVIL 3D FORMAT ONLY. ANY FILE CONVERSIONS WILL BE AT THE CONTRACTOR'S EXPENSE.

ENGINEER CERTIFICATION

I HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF FLORIDA PRACTICING WITH AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC., A CORPORATION AUTHORIZED TO OPERATE AS A BUSINESS PROVIDING ENGINEERING CONSULTING SERVICES; FLORIDA REGISTERED ENGINEERING FIRM F-12, BY THE STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS. I FURTHER CERTIFY THAT I, OR OTHERS UNDER MY DIRECT SUPERVISION, HAVE PREPARED THE GEOTECHNICAL ENGINEERING EVALUATIONS, FINDINGS, CALCULATIONS, CONCLUSIONS OR TECHNICAL ADVICE HEREBY SUBMITTED IN THESE PLANS.

SIGNATURE: \_\_\_\_\_  
NAME: TANEL N. ANDRY, P.E.  
P.E. NUMBER: 56775  
DATE: 6/20/18



349-FY-8AB



**PLANS PREPARED BY:**

amec foster wheeler

Amec Foster Wheeler  
Environment & Infrastructure, Inc.  
1101 Channelside Dr., Suite 200, Tampa, FL 33602  
Phone: 1.813.289.0750 Fax: 1.813.289.5474  
www.amecfw.com CA-5392

GENERAL NOTES

- 1. ALL CONSTRUCTION SHALL CONFORM TO THE CONSTRUCTION DRAWINGS AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL COMPLY WITH SWFWMD STANDARDS AND SPECIFICATIONS FOR STRIPPING, CLEARING, GRUBBING, GRADING, BACKFILLING, AND EMBANKMENT PREPARATION.
3. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ACQUIRE THE NECESSARY RIGHT-OF-WAY UTILIZATION PERMIT(S) AND PROVIDE FOR THE SAFETY OF LOCAL TRAFFIC DURING CONSTRUCTION.
...
30. THE SEASONAL HIGH WATER TABLE FOR THE POND IS ASSUMED TO BE AT ELEVATION 3.00FT (PLANT DATUM).

EROSION AND SEDIMENT CONTROL NOTES

- 1. CONTRACTOR SHALL PROVIDE, AND RECEIVE APPROVAL FROM THE OWNER, A SWPPP PLAN PRIOR TO THE START OF ANY WORK.
2. CONTRACTOR TO ENSURE SILT FENCING, SEDIMENT BASINS, CONSTRUCTION ENTRANCE ARE INSTALLED ON SITE PRIOR TO ANY LAND DISTURBANCE, CLEARING AND MASS GRADING ACTIVITIES.
3. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY TRACKING ONTO THE PAVED SURFACE.
...
21. PRIOR TO EXCAVATION, THE PERIMETER OF THE PERMITTED SOIL EXCAVATING SHALL BE ADEQUATELY STAKED TO DELINEATE THE EXCAVATION. THESE STAKES SHALL BE MAINTAINED THROUGHOUT THE DURATION OF EXCAVATION.

MAINTENANCE OF TRAFFIC (MOT)

- 1. MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION AND REVISIONS) AND THE FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN STANDARDS (LATEST EDITION AND REVISIONS).
2. LOCAL RESIDENTIAL/BUSINESS ACCESS SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE RESIDENTS/BUSINESSES AFFECTED BY CONSTRUCTION ACTIVITIES.
...
15. THE TCS SHALL BE RESPONSIBLE FOR PERFORMING WEEKLY, DAYTIME AND NIGHTTIME INSPECTIONS OF ALL TRAFFIC CONTROL DEVICES, TRAFFIC FLOW, PEDESTRIAN, BICYCLIST MOVEMENT THROUGH THE WORK AREA AND BUSINESS ACCOMMODATIONS.

SURVEY NOTES:

- 1. ELEVATIONS ARE SHOWN IN TEC PLANT DATUM. TO CONVERT TO NAVD88, SUBTRACT 1.971 FT FROM THE PLANT DATUM. TO CONVERT PLANT DATUM TO NAVD29, SUBTRACT 1.072 FT FROM PLANT DATUM.
2. CONCEPTUAL MAP, ELEVATIONS AND FEATURE LOCATIONS ARE BASED ON SURVEY DATA PROVIDED BY GEORGE F. YOUNG INC. (March 3, 2017).
3. CONTRACTOR TO COORDINATE WITH THE OWNER TO VERIFY EXISTING SURVEY MONUMENTS.

STRUCTURAL NOTES:

- 1. ALL CONSTRUCTION SHALL CONFORM TO FLORIDA BUILDING CODE 6TH EDITION. REFERENCE TO OTHER STANDARD SPECIFICATIONS OR CODES SHALL MEAN THE LATEST STANDARD OR CODE ADOPTED AND PUBLISHED.
2. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS BEFORE STARTING WORK. NOTIFY THE STRUCTURAL ENGINEER IN WRITING OF CONDITIONS ENCOUNTERED IN THE FIELD CONTRADICTORY TO THOSE SHOWN ON THE STRUCTURAL CONTRACT DOCUMENTS.
...
5.2. ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE PROCEDURE

FOUNDATIONS:

- 1. THE DESIGN OF FOOTINGS, AND STRUCTURAL SLAB IS BASED ON AN ALLOWABLE BEARING PRESSURE OF 3000 PSF.
2. A QUALIFIED SOIL TECHNICIAN SHALL EVALUATE CONDITION AND/OR ADEQUACY OF ALL SUBGRADES, FILLS AND BACKFILLS PER PROJECT SPECIFICATIONS AND THE GEOTECHNICAL REPORTS BEFORE PLACEMENT OF FOUNDATIONS, FOOTINGS, SLABS, WALLS, FILLS, BACKFILLS, ETC.
3. REFER TO GEOTECHNICAL REPORT FOR RECOMMENDATIONS FOR INSTALLATION OF FOUNDATION AND OTHER UNDERGROUND STRUCTURES.

REINFORCED CONCRETE:

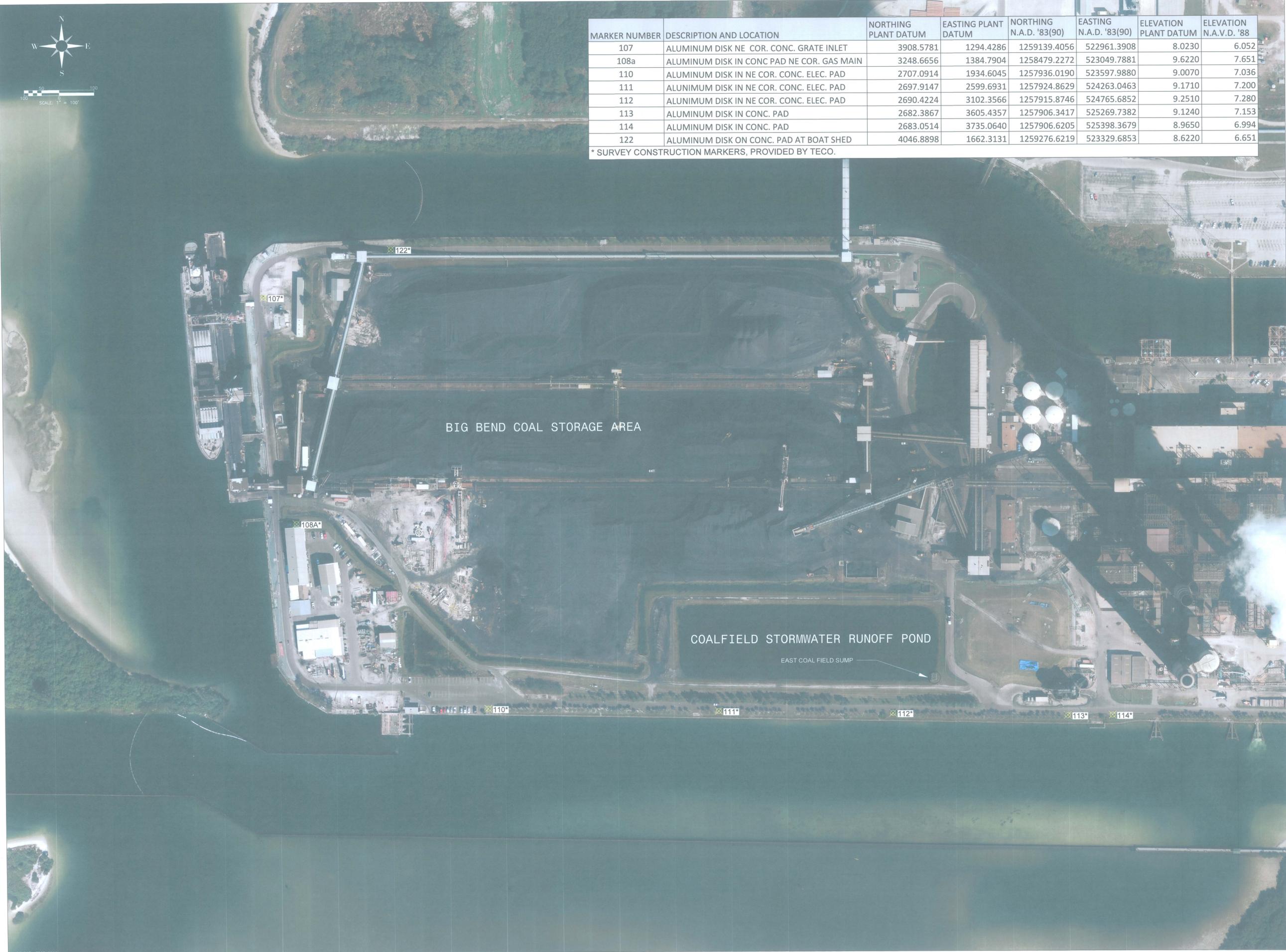
- 1. REINFORCED CAST-IN-PLACE CONCRETE CONSTRUCTION SHALL COMPLY WITH ACI 318-14
2. READY MIX CONCRETE SHALL COMPLY WITH ASTM C-94-00.
3. COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 4000 PSI AT 28 DAYS.
...
16. DO NOT WELD OR TACK WELD REINFORCING BARS.

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH . . . 3"
SLABS . . . 4"
ALL OTHER . . . 4"

Vertical sidebar containing project information: TAMPA ELECTRIC CO., BIG BEND STATION, BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND, GENERAL NOTES, APOLLO BEACH, FLORIDA. Includes logos for amec foster wheeler and Amec Foster Wheeler Environment & Infrastructure Inc. Also contains a professional engineer seal for Tamer Nurije-Esm Andy, No. 56778, State of Florida.

DATE: June 20, 2018
DRAWN BY: M. VIVES
CHECKED BY: T. ANDRY
PROJECT NO.: 300996

PROJECT NUMBER: XXXX.XX CITY: TAMPA Z:\Geotech\300000\Projects\300096\TECO WSDP ClosureDrawings\CD\2018\May\_2018\349-FY-8AD.dwg LAYOUT SHEET 9. SAVED: 6/20/2018 2:03 PM. PLOTSTYLETABLE: CIVIL\_MASTER.CTB PLOTTED: 6/20/2018 4:30 PM BY: VIVES, MARTIN



MARKER NUMBER	DESCRIPTION AND LOCATION	NORTHING PLANT DATUM	EASTING PLANT DATUM	NORTHING N.A.D. '83(90)	EASTING N.A.D. '83(90)	ELEVATION PLANT DATUM	ELEVATION N.A.V.D. '88
107	ALUMINUM DISK NE COR. CONC. GRATE INLET	3908.5781	1294.4286	1259139.4056	522961.3908	8.0230	6.052
108a	ALUMINUM DISK IN CONC PAD NE COR. GAS MAIN	3248.6656	1384.7904	1258479.2272	523049.7881	9.6220	7.651
110	ALUMINUM DISK IN NE COR. CONC. ELEC. PAD	2707.0914	1934.6045	1257936.0190	523597.9880	9.0070	7.036
111	ALUMINUM DISK IN NE COR. CONC. ELEC. PAD	2697.9147	2599.6931	1257924.8629	524263.0463	9.1710	7.200
112	ALUMINUM DISK IN NE COR. CONC. ELEC. PAD	2690.4224	3102.3566	1257915.8746	524765.6852	9.2510	7.280
113	ALUMINUM DISK IN CONC. PAD	2682.3867	3605.4357	1257906.3417	525269.7382	9.1240	7.153
114	ALUMINUM DISK IN CONC. PAD	2683.0514	3735.0640	1257906.6205	525398.3679	8.9650	6.994
122	ALUMINUM DISK ON CONC. PAD AT BOAT SHED	4046.8898	1662.3131	1259276.6219	523329.6853	8.6220	6.651

\* SURVEY CONSTRUCTION MARKERS, PROVIDED BY TECO.

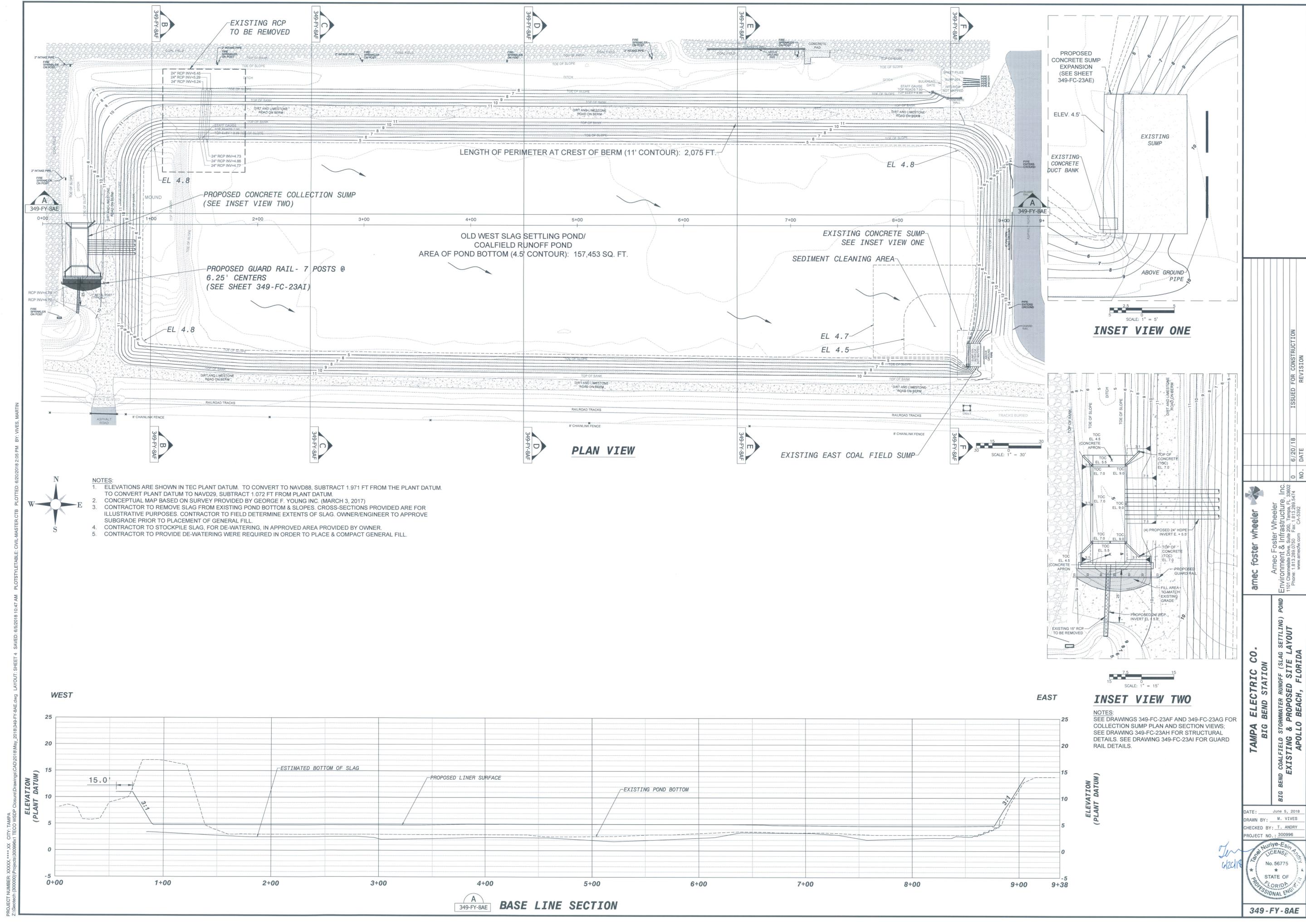
NO.	DATE	REVISION
0	6/20/18	ISSUED FOR CONSTRUCTION

amec foster wheeler  
 Amec Foster Wheeler  
 Environment & Infrastructure, Inc  
 1101 Chesapeake Drive, Suite 200, Tampa, FL 33602  
 Phone: 1.813.288.0750 Fax: 1.813.288.6474  
 www.amec.com CA-0392

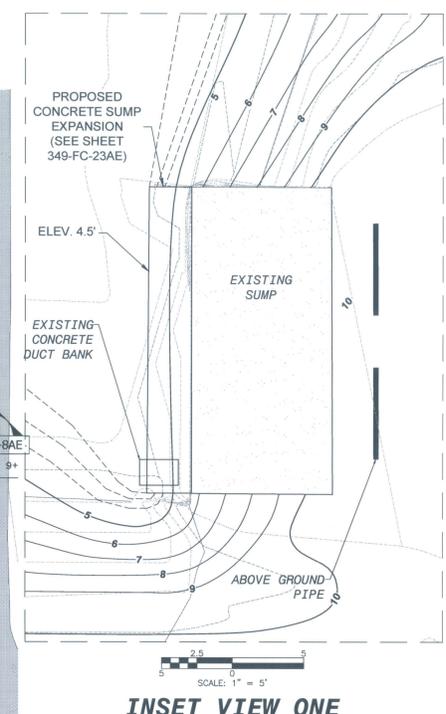
**TAMPA ELECTRIC CO.**  
 BIG BEND STATION  
 BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
 OVERALL SITE PLAN  
 APOLLO BEACH, FLORIDA

DATE: June 20, 2018  
 DRAWN BY: M. VIVES  
 CHECKED BY: T. ANDRY  
 PROJECT NO.: 300996

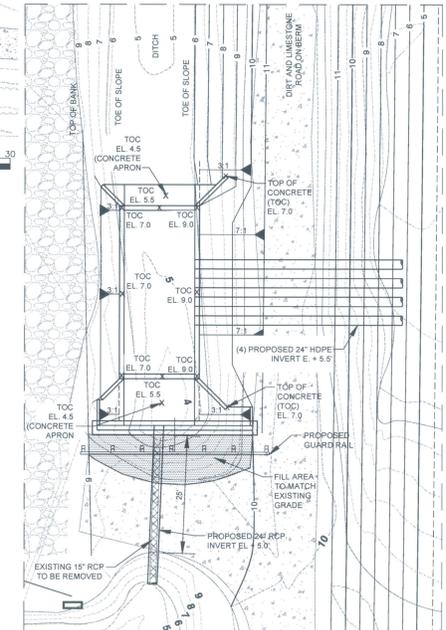




**PLAN VIEW**

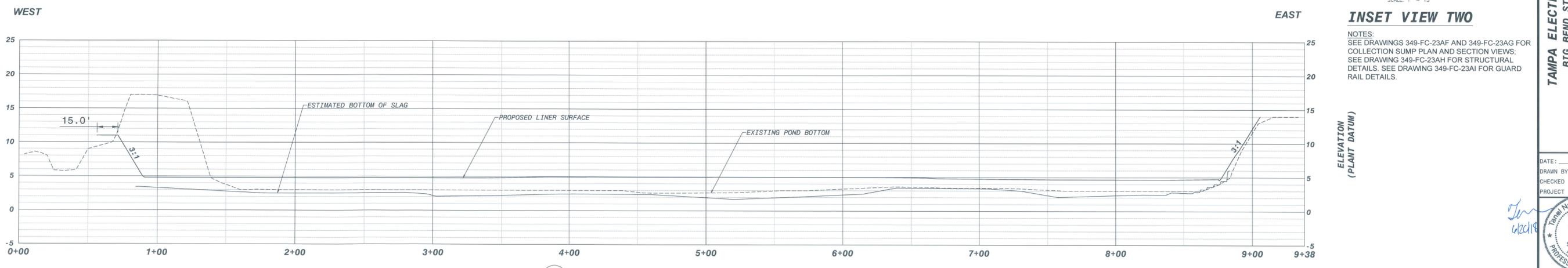


**INSET VIEW ONE**



**INSET VIEW TWO**

- NOTES:**
- ELEVATIONS ARE SHOWN IN TEC PLANT DATUM. TO CONVERT TO NAVD88, SUBTRACT 1.971 FT FROM THE PLANT DATUM. TO CONVERT PLANT DATUM TO NAVD29, SUBTRACT 1.072 FT FROM PLANT DATUM.
  - CONCEPTUAL MAP BASED ON SURVEY PROVIDED BY GEORGE F. YOUNG INC. (MARCH 3, 2017)
  - CONTRACTOR TO REMOVE SLAG FROM EXISTING POND BOTTOM & SLOPES. CROSS-SECTIONS PROVIDED ARE FOR ILLUSTRATIVE PURPOSES. CONTRACTOR TO FIELD DETERMINE EXTENTS OF SLAG. OWNER/ENGINEER TO APPROVE SUBGRADE PRIOR TO PLACEMENT OF GENERAL FILL.
  - CONTRACTOR TO STOCKPILE SLAG FOR DE-WATERING IN APPROVED AREA PROVIDED BY OWNER.
  - CONTRACTOR TO PROVIDE DE-WATERING WERE REQUIRED IN ORDER TO PLACE & COMPACT GENERAL FILL.



**BASE LINE SECTION**

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISION
0	6/20/18		

**amec foster wheeler**  
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**TAMPA ELECTRIC CO.**  
 BIG BEND STATION  
 BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
 EXISTING & PROPOSED SITE LAYOUT  
 APOLLO BEACH, FLORIDA

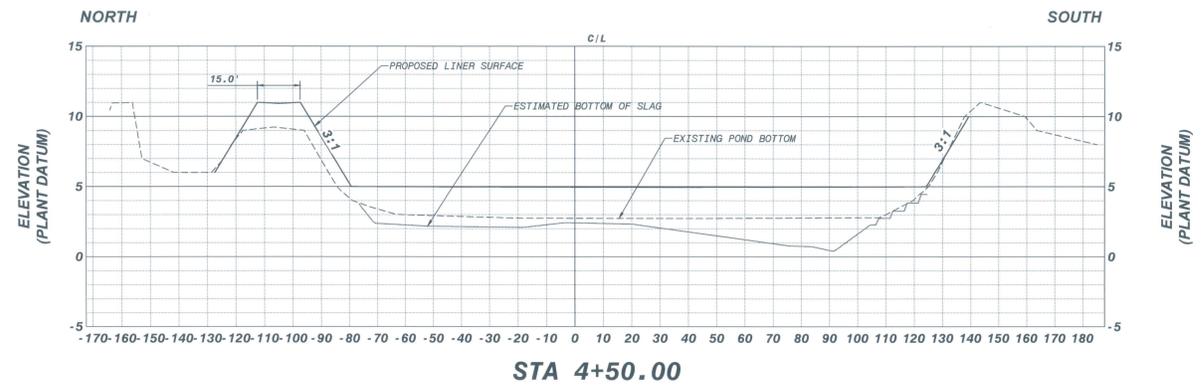
DATE: June 5, 2018  
 DRAWN BY: M. VIVES  
 CHECKED BY: T. ANDRY  
 PROJECT NO.: 300996



349-FY-8AE

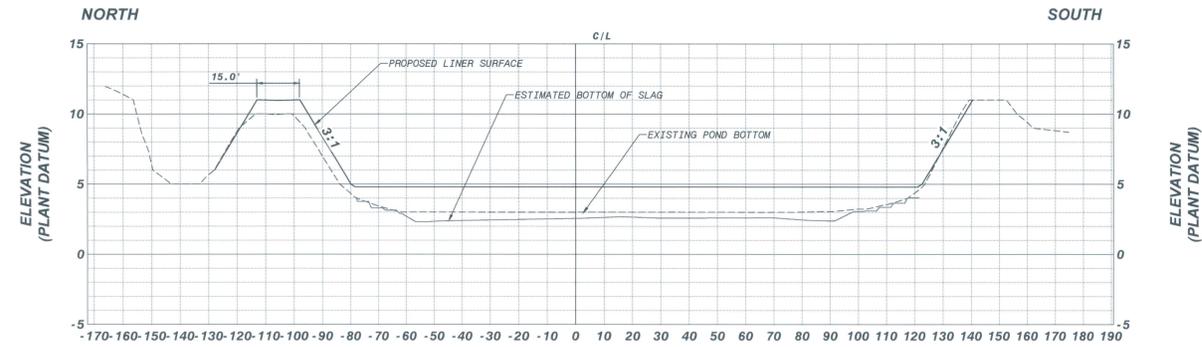
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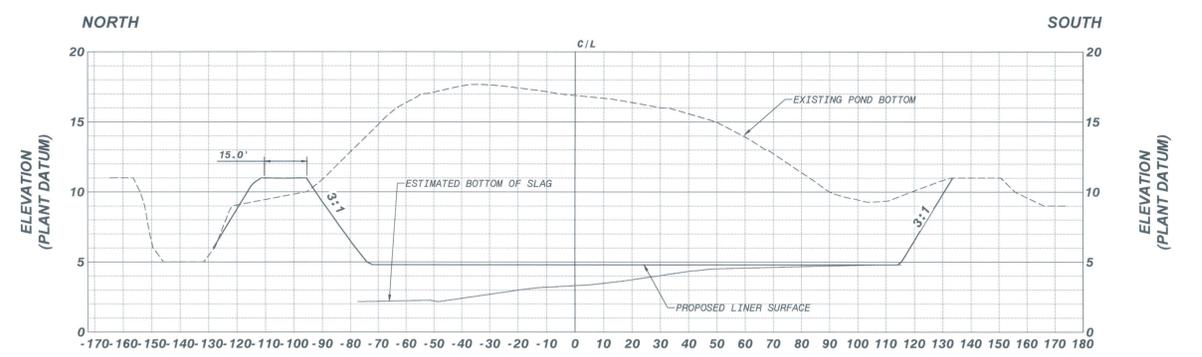
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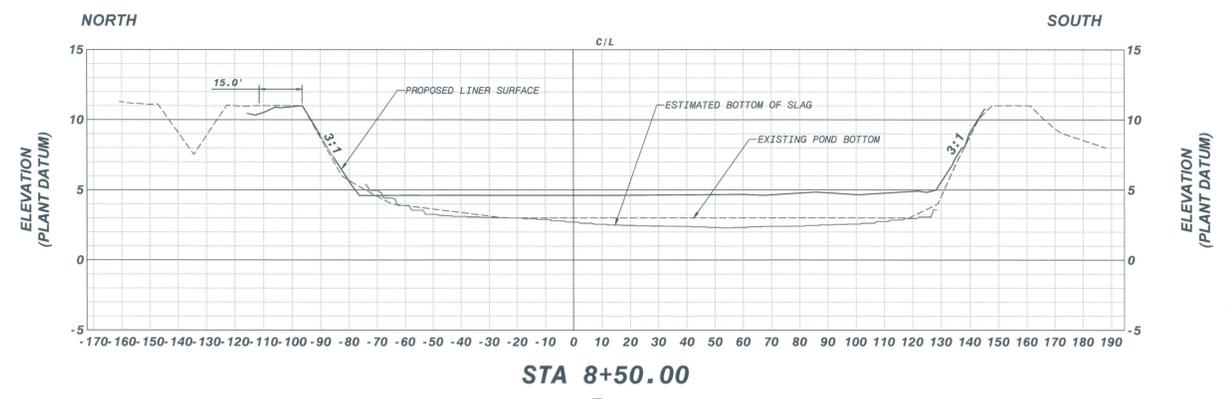
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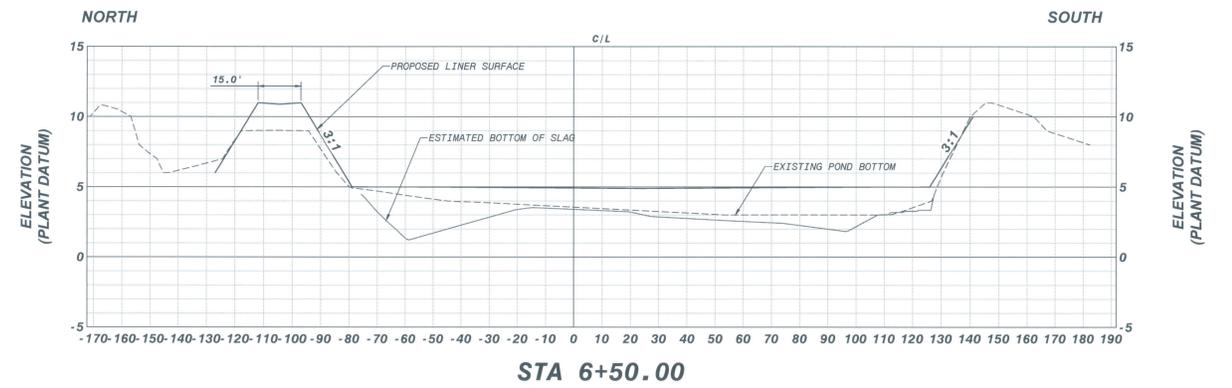
STA 1+00.00

B  
349-FY-8AF



STA 8+50.00

F  
349-FY-8AF



STA 6+50.00

E  
349-FY-8AF

ELEVATION  
(PLANT DATUM)

ELEVATION  
(PLANT DATUM)

NO.	DATE	REVISION
0	6/20/18	ISSUED FOR CONSTRUCTION

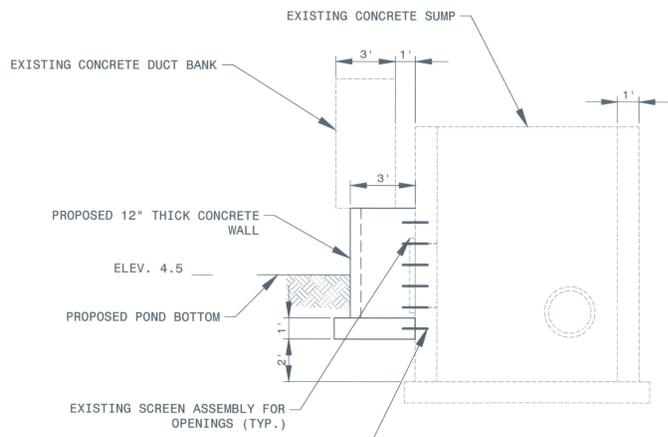
amec foster wheeler  
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 1101 Chamelale Drive, Suite 200, Tampa, FL 33602  
 Phone: 1.813.289.0750 Fax: 1.813.289.5474  
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TAMPA ELECTRIC CO.  
 BIG BEND STATION  
 BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
 PROFILE VIEWS  
 APOLLO BEACH, FLORIDA

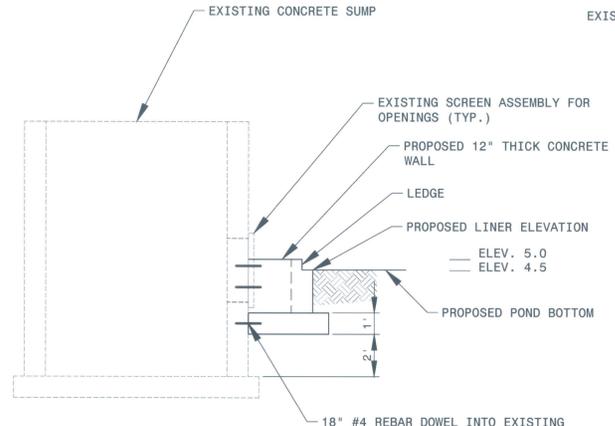
DATE: June 4, 2018  
 DRAWN BY: M. VIVES  
 CHECKED BY: T. ANDRY  
 PROJECT NO: 300996



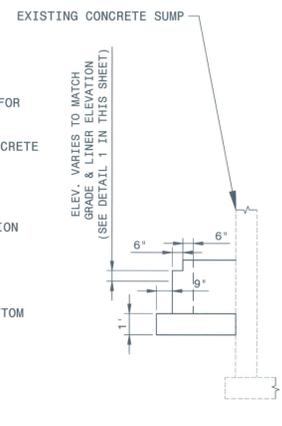
349-FY-8AF



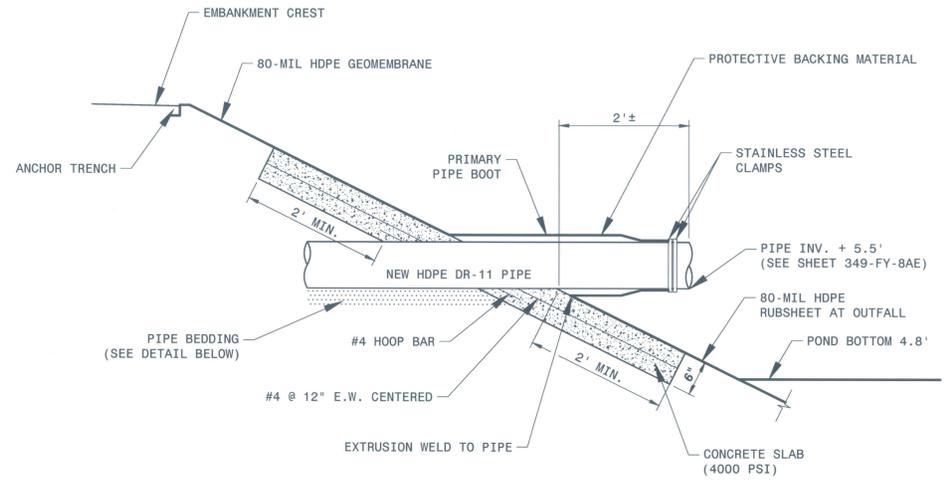
**SOUTH ELEVATION**



**NORTH ELEVATION**



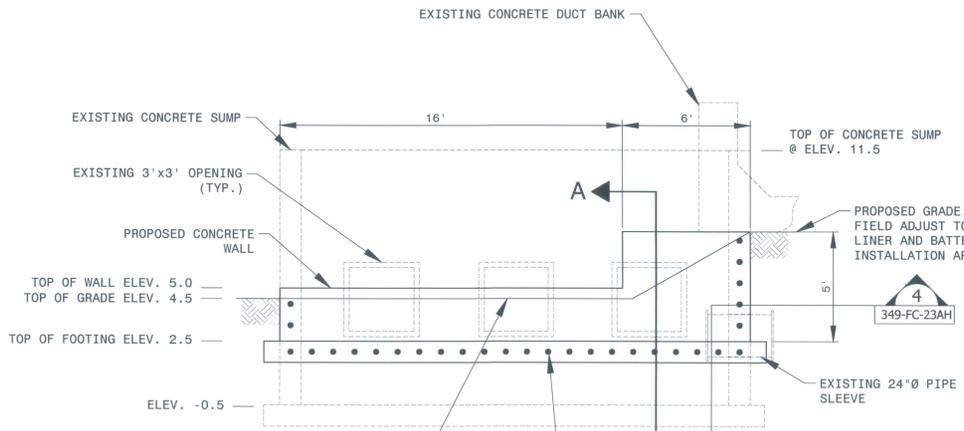
**SECTION A**



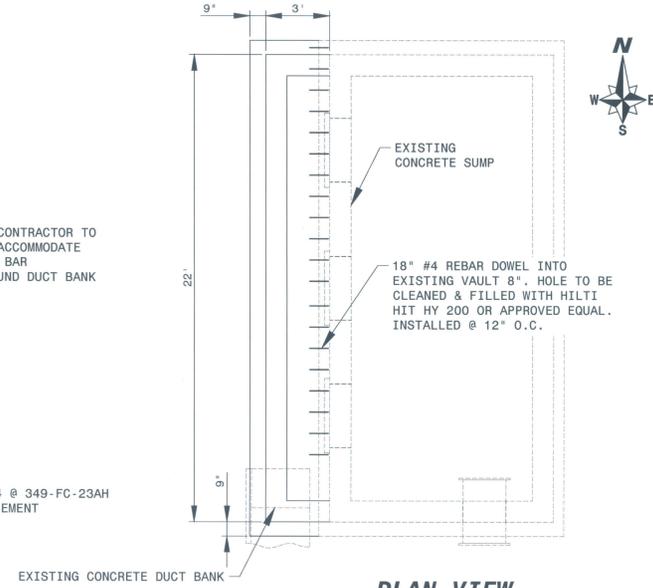
**3 DISCHARGE PIPE PENETRATION BOOT DETAIL**  
349-FC-23AE NOT TO SCALE

18" #4 REBAR DOWEL INTO EXISTING VAULT WITH 8" EMBED. HOLE TO BE CLEANED & FILLED WITH HILTI HIT HY 200 OR APPROVED EQUAL. INSTALLED @ 12" O.C. (MAX) PER MANUFACTURER'S RECOMMENDATIONS.

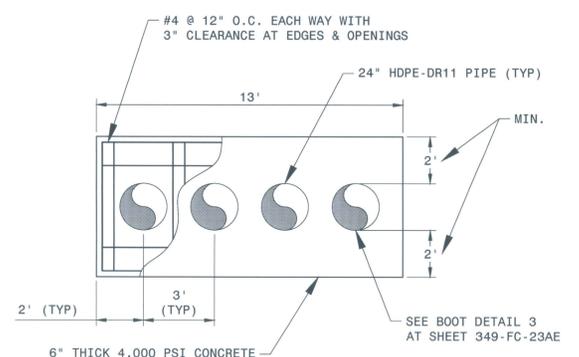
18" #4 REBAR DOWEL INTO EXISTING VAULT WITH 8" EMBED. HOLE TO BE CLEANED & FILLED WITH HILTI HIT HY 200 OR APPROVED EQUAL. INSTALLED @ 12" O.C. (MAX) PER MANUFACTURER'S RECOMMENDATIONS.



**WEST ELEVATION**

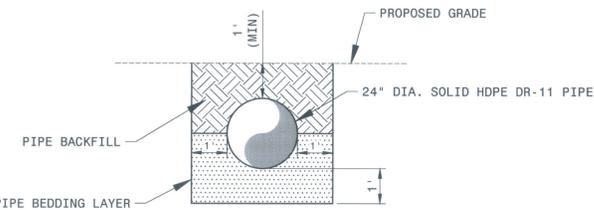


**PLAN VIEW**

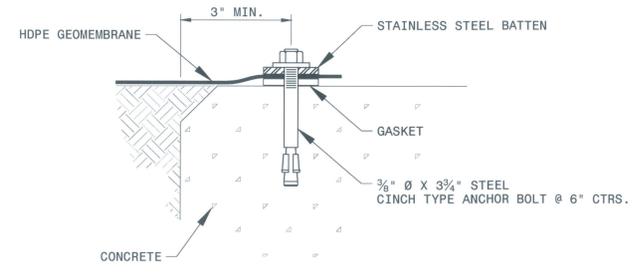


**DISCHARGE PIPE PENETRATION DETAIL (PLAN VIEW)**  
NOT TO SCALE

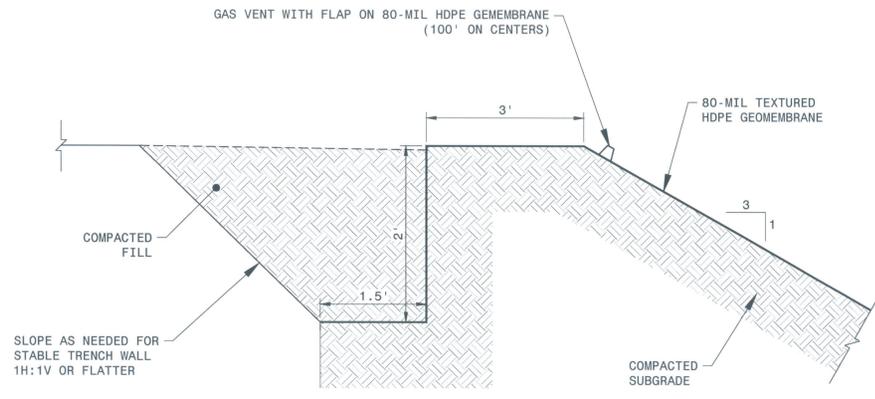
**CONCRETE SUMP EXPANSION - ORTHOGRAPHIC VIEWS**  
NOT TO SCALE



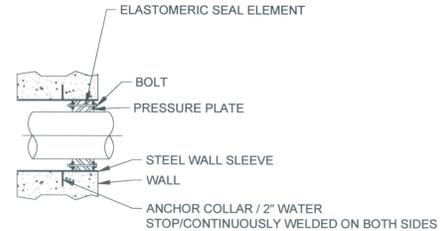
**TYPICAL PIPE BEDDING DETAIL**  
NOT TO SCALE



**1 STEEL BATTEN WITH CONCRETE ANCHOR DETAIL**  
349-FC-23AE NOT TO SCALE



**2 LINER ANCHOR TRENCH DETAIL**  
349-FC-23AE NOT TO SCALE



**A WALL SEAL PIPING DETAIL**  
349-FC-23AE NOT TO SCALE

NOTE: CONTRACTOR TO PROVIDE WATER STOP AT PROPOSED TO EXISTING CONCRETE INTERFACE. (JP SPECIALITIES, INC. / EARTH SHIELD PART # JP 3366 OR SIMILAR APPROVED BY ENGINEER).

PROJECT NUMBER: 300969X1, CITY: TAMPA, Z:\Electrical\300969X1\Projects\300969X1\_TECO WSDP\02\Drawings\CAD\2018\May\_2018\349-FC-23AE.dwg, LAYOUT: SHEET 6, SAVED: 04/20/18 5:12 PM, PLOTSTYLETABLE: CIVIL\_MASTER.CTB, PLOTTED: 06/20/18 2:10 PM BY: VIVES, MARTIN

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISION
0	6/20/18		

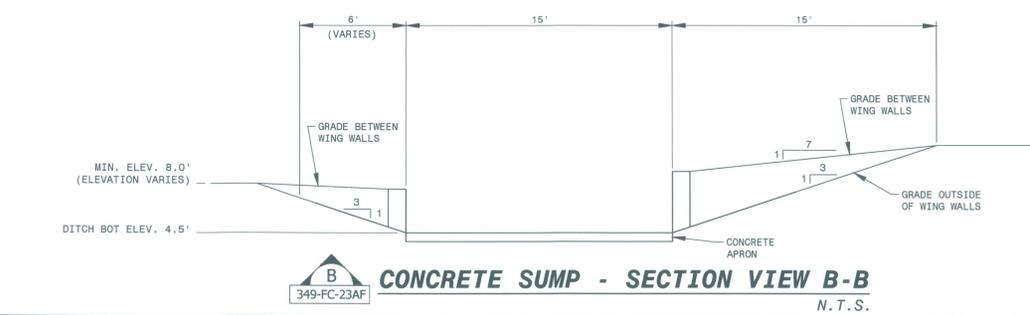
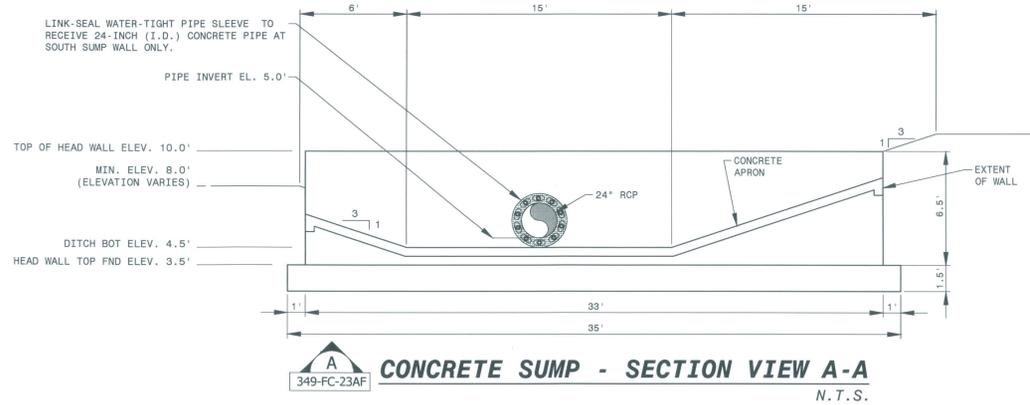
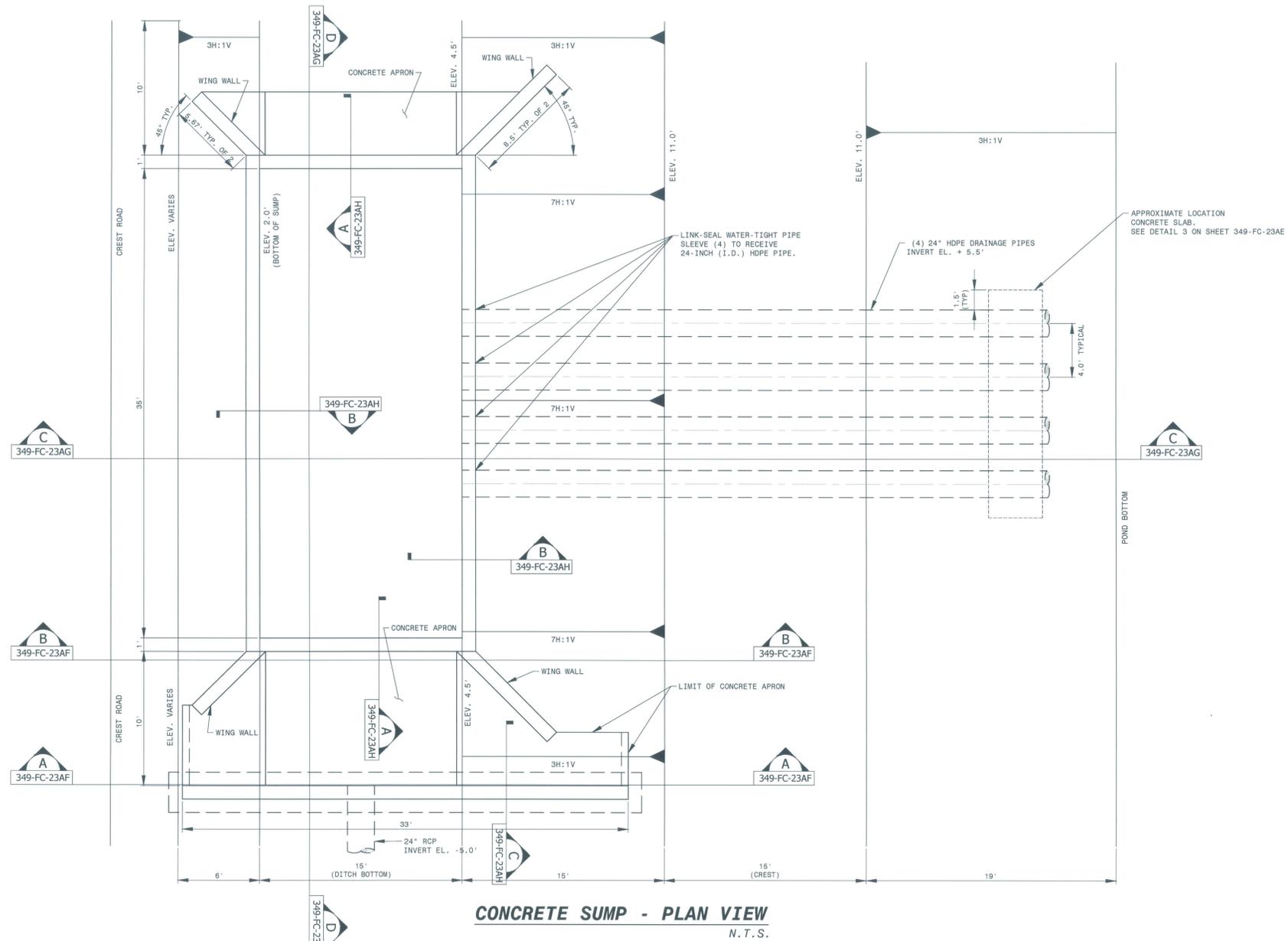
**TAMPA ELECTRIC CO.**  
BIG BEND STATION  
BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
LINER AND INSTALLATION DETAILS  
APOLLO BEACH, FLORIDA

DATE: June 4, 2018  
DRAWN BY: M. VIVES  
CHECKED BY: T. DAY  
PROJECT NO.: 300969

**TRRELL K. DAY**  
No. 82160  
STATE OF FLORIDA  
PROFESSIONAL ENGINEER  
6/20/18

349-FC-23AE

PROJECT NUMBER: 300996X1 CITY: TAMPA  
 Z:\Geotech\300000\Projects\300996X1\TECO\WSDP\Closure\Drawings\CAD\2018\May\_2018\349-FC-23AF.dwg LAYOUT SHEET 7, SAVED: 6/20/2018 4:29 PM PLOT STYLE TABLE: CIVIL MASTER.CTB PLOTTED: 6/20/2018 4:31 PM BY: VIVES, MARTIN



NOTE:  
 PROVIDE 24"Ø REINFORCED CONCRETE PIPE PER SECTION 430 OF FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISION
0	6/20/18		

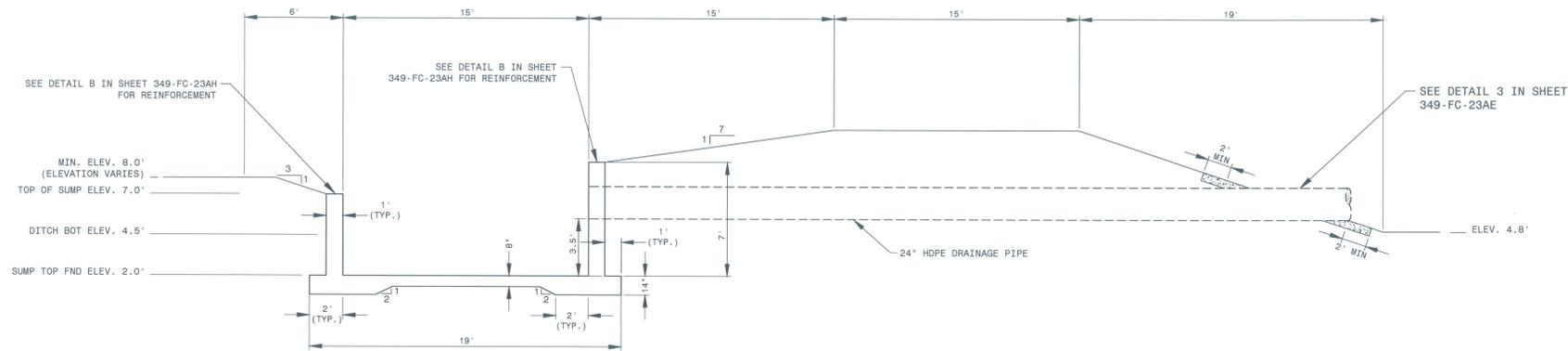
amec foster wheeler  
 Amec Foster Wheeler  
 Environment & Infrastructure, Inc.  
 1101 Channellade Drive, Suite 200, Tampa, FL 33602  
 www.amecfw.com Registration Number F-12

TAMPA ELECTRIC CO.  
 BIG BEND STATION  
 BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
 CONCRETE SUMP (1 OF 2)  
 APOLLO BEACH, FLORIDA

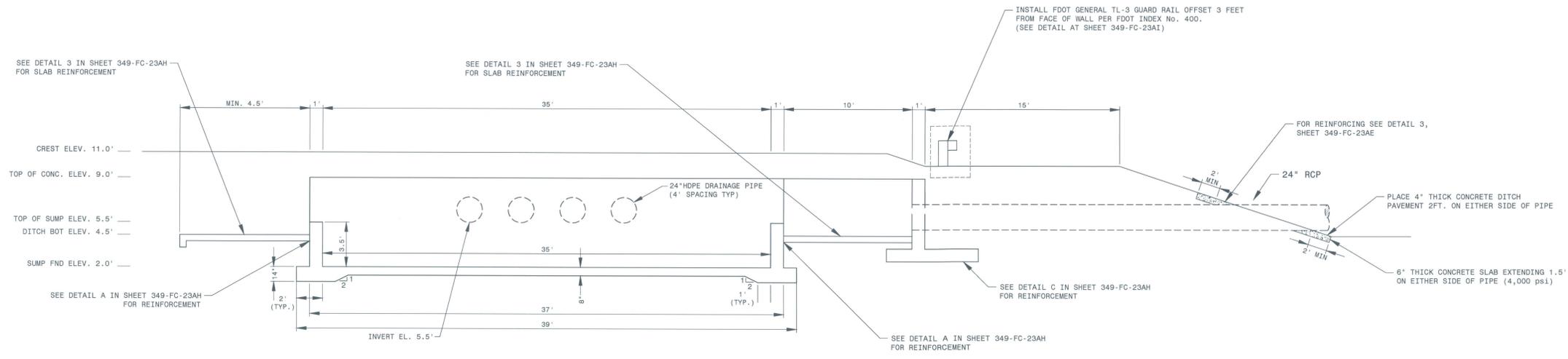
DATE: June 20, 2018  
 DRAWN BY: M. VIVES  
 CHECKED BY: T. DAY  
 PROJECT NO.: 300996

IRRELL K. LICENSE No. 82160  
 STATE OF FLORIDA PROFESSIONAL ENGINEER

349-FC-23AF




**CONCRETE SUMP - SECTION VIEW C-C**  
 N.T.S.




**CONCRETE SUMP - SECTION VIEW D-D**  
 N.T.S.

PROJECT NUMBER: 300996X1 CITY: TAMPA  
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NO.	DATE	ISSUED FOR CONSTRUCTION	REVISION
0	6/20/18		

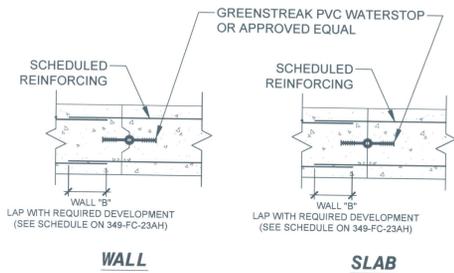
**amec foster wheeler**  
 Amec Foster Wheeler  
 Environment & Infrastructure, Inc.  
 1101 Channelside Drive, Suite 200, Tampa, FL 33602  
 www.amecfw.com Registration Number F-12

**TAMPA ELECTRIC CO.**  
 BIG BEND STATION  
 BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
 CONCRETE SUMP (2 OF 2)  
 APOLLO BEACH, FLORIDA

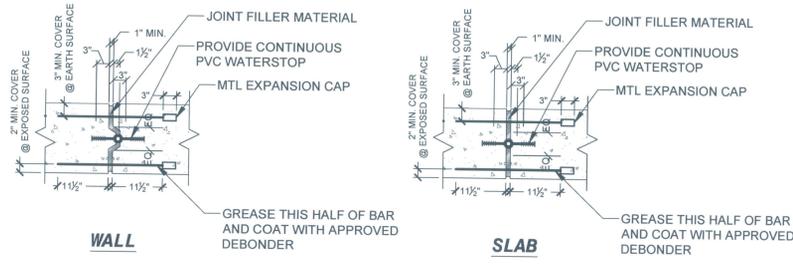
DATE: June 20, 2018  
 DRAWN BY: M. VIVES  
 CHECKED BY: T. DAY  
 PROJECT NO.: 300996



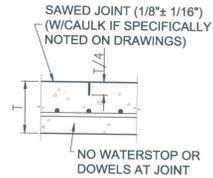
349-FC-23AG



**1 CONSTRUCTION JOINT**  
349-FC-23AH NOT TO SCALE



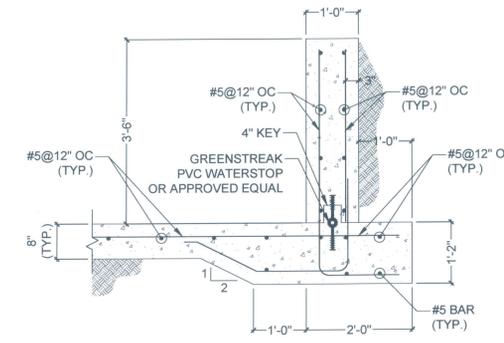
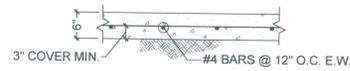
**2 EXPANSION/CONSTRUCTION JOINT**  
349-FC-23AH NOT TO SCALE



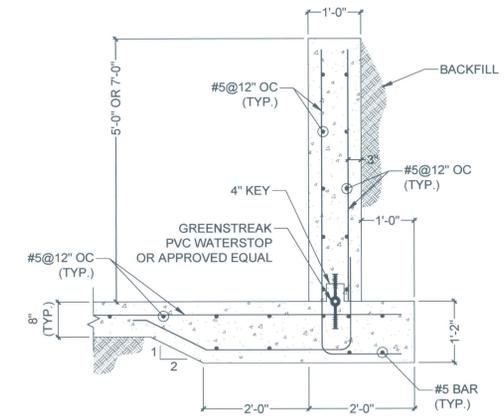
**3 SAWED CONSTRUCTION JOINT**  
SLAB-ON-GRADE

- NOTES:
- TYPICAL CONTROL JOINT NOTES 1 THROUGH 3 NOT APPLICABLE.
  - "SJ" - NO WATERSTOP.
  - JOINT FORMED WITH TOOL OR INSERT STRIP MAY BE SUBSTITUTED FOR SAWED TYPE ONLY WITH PRIOR ACCEPTANCE OF THE ENGINEER.

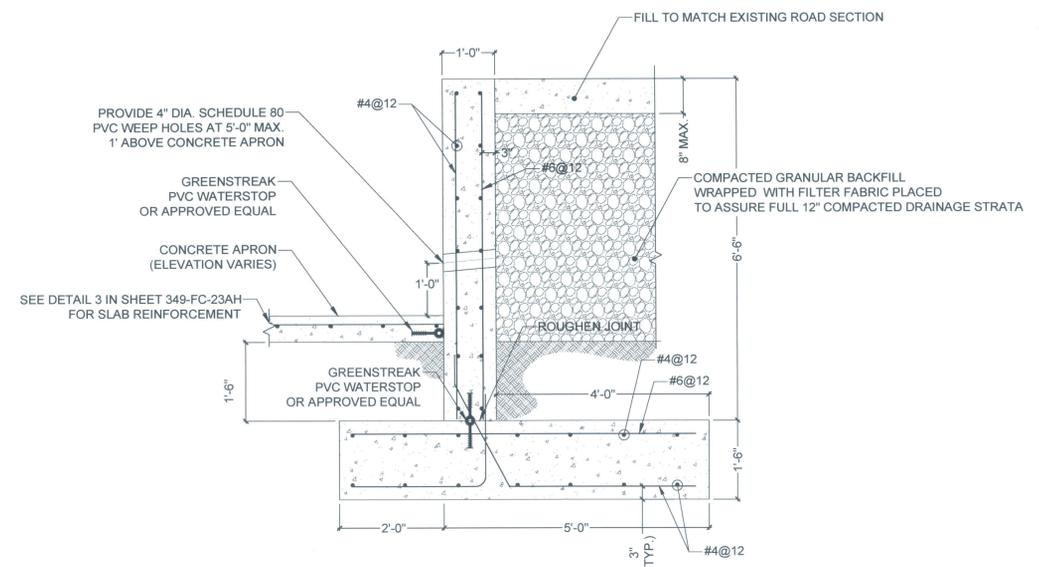
**3 SLAB REINFORCING DETAIL**  
349-FC-23AH SCALE: 3/4" = 1'



**A SUMP SECTION TYPE I**  
349-FC-23AH SCALE: 3/4" = 1'

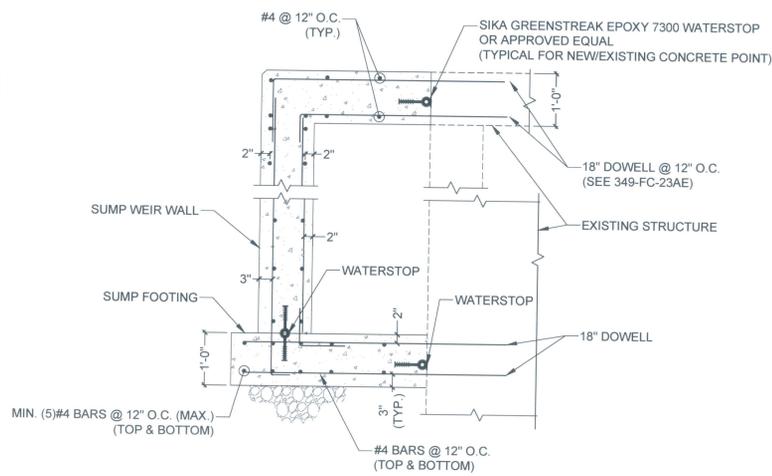


**B SUMP SECTION TYPE II**  
349-FC-23AH SCALE: 3/4" = 1'

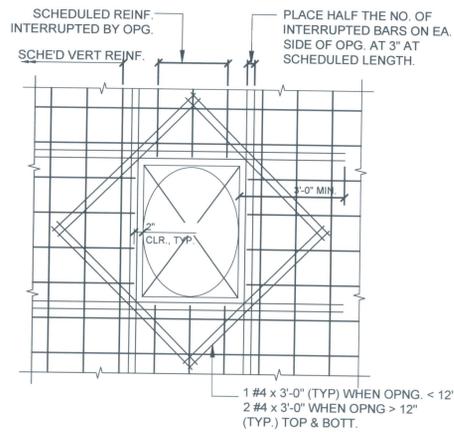


**C RETAINING WALL SECTION**  
349-FC-23AH SCALE: 3/4" = 1'

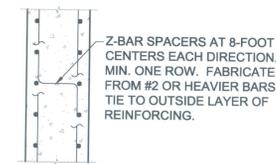
- WALL NOTES:
- ALL CONSTRUCTION JOINTS AND EXPANSION JOINTS SHALL BE CONSTRUCTED WITH WATERSTOPS.
  - PROVIDE 1" CHAMFER FOR ALL EXPOSED CONCRETE.



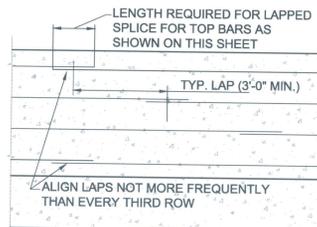
**4 EAST SUMP REINFORCING DETAIL**  
349-FC-23AH SCALE: 3/4" = 1'



**5 WALL OPENING DETAIL**  
349-FC-23AH NOT TO SCALE



**SPACERS FOR WALL REINFORCEMENT**



**WALL ELEVATION**

**SPLICE & DEVELOPMENT LENGTHS**  
(UNLESS NOTED OTHERWISE ON THE DRAWINGS)

WALLS, SLABS AND FOOTINGS					
LENGTH OF LAPPED SPLICES FOR REIN (INCHES)		LENGTH OF END ANCHORAGE FOR DEVELOPMENT OF REINFORCING (INCHES)			BAR SIZE
*TOP BARS	OTHERS	*TOP BARS	OTHERS	HOOKE BARS	
19	16	14	12	6	3
24	19	19	15	7	4
31	24	24	18	9	5
36	28	28	22	10	6
54	42	42	32	12	7
102	78	55	42	14	8
129	99	69	53	15	9
163	126	88	68	17	10
201	154	154	113	19	11
---	---	210	162	33	14
---	---	309	238	43	18

**CONCRETE COVER FOR REINFORCEMENT**

LOCATION	MIN. COVER
UNFORMED SURFACES ADJACENT TO EXCAVATION	3"
FORMED OR TOP SURFACES EXPOSED TO WEATHER OR SATURATED AIR, SUBMERGED OR IN CONTACT WITH EARTH, INCLUDING STIRRUPS, TIES OR SPIRALS	2"
OTHER LOCATIONS	
BARS IN BEAMS OR GIRDERS, INCLUDING STIRRUPS AND COLUMN SPIRALS OR TIES	1-1/2"
SLABS, WALLS AND JOISTS #6 AND LARGER	1-1/2"
#5 AND SMALLER	3/4"

\* TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR THE TOP BARS. VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS.

IN WALLS, SLABS AND FOOTINGS, LAPPED SPLICE LENGTH FOR BARS SIZE 8 THROUGH 11 AND STRAIGHT (NON-HOOKED) END ANCHORAGE DEVELOPMENT LENGTH FOR BAR SIZE 11 (IN TABLE ABOVE) PLACED WITH MORE THAN 2 BAR DIAMETER CLEAR SPACING MAY BE MULTIPLIED BY A FACTOR OF 0.7.

IN BEAMS, COLUMNS, WALLS, SLABS AND FOOTINGS, LAPPED SPLICE LENGTH AND STRAIGHT (NON-HOOKED) END ANCHORAGE DEVELOPMENT LENGTH FOR BARS SIZE 7 THROUGH 11 (IN TABLE ABOVE) PLACED WITH MORE THAN 5 BAR DIAMETER CLEAR SPACING MAY BE MULTIPLIED BY A FACTOR OF 0.8. THE MULTIPLICATION FACTORS OF 0.7 AND 0.8 MAY BE COMBINED ONLY FOR BARS COMMON TO THIS NOTE AND THE NOTE ABOVE.

LAPPED SPLICES SHALL NOT BE MADE AT POINTS OF MAXIMUM STRESS UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR AS DETERMINED BY THE ENGINEER.

PROVIDE HOOK LENGTHS LONGER THAN STANDARD LENGTHS WHERE EXTENDED HOOKS ARE INDICATED ON THE DRAWINGS.

PROJECT NUMBER: 30096X1 CITY: TAMPA  
Z:\Geotech (300000)\Projects\30096X1\TECO\MSDP Closure\Drawings\CAD\2018\May\_2018\349-FC-23AH.dwg LAYOUT: SHEET 9 SAVED: 6/20/2018 2:33 PM PLOTSTYLETABLE: CIVIL-MASTER.CTB PLOTTED: 6/20/2018 2:34 PM BY: VIVES, MARTIN

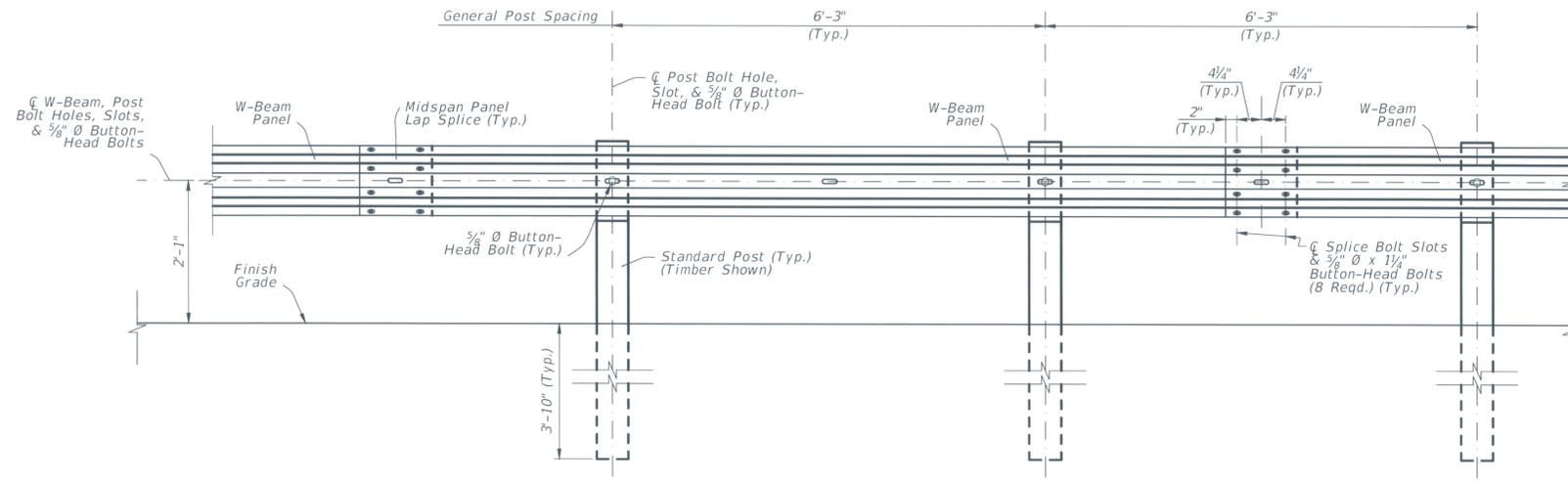
NO.	DATE	ISSUED FOR CONSTRUCTION	REVISION
0	6/20/18		

**TAMPA ELECTRIC CO.**  
BIG BEND STATION  
BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
CONCRETE SUMP DETAILS  
APOLLO BEACH, FLORIDA

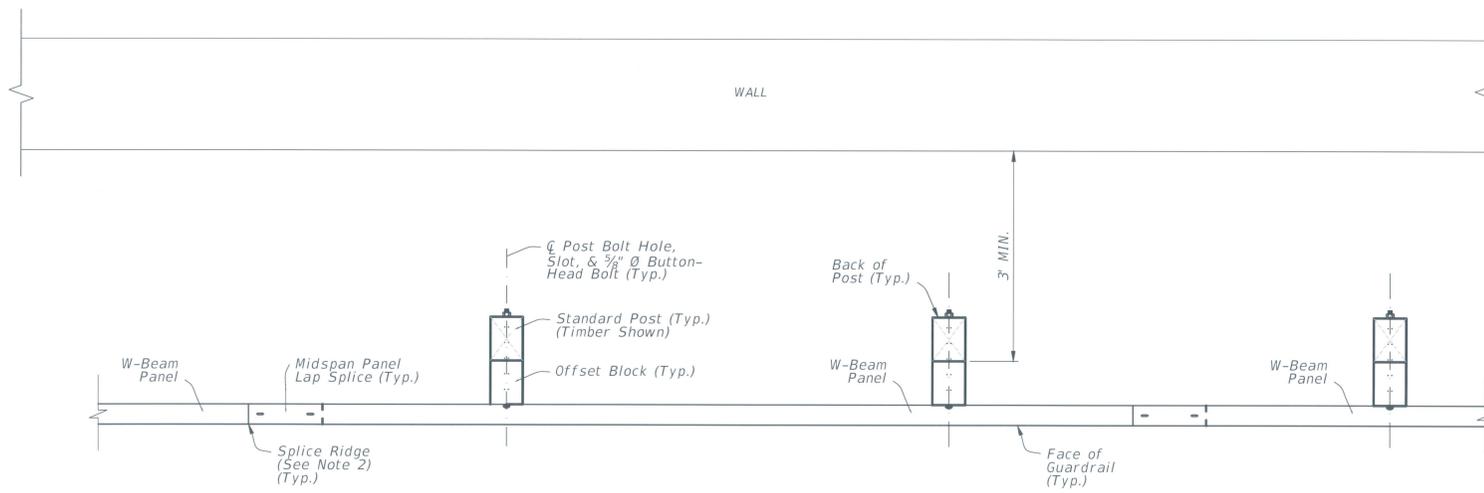
DATE: June 20, 2018  
DRAWN BY: M. VIVES  
CHECKED BY: T. DAY  
PROJECT NO.: 300996

IRELL K. DAY  
No. 82160  
FLORIDA  
PROFESSIONAL ENGINEER

349-FC-23AH

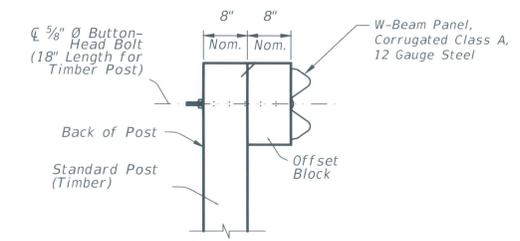


GENERAL GUARDRAIL  
INSTALLED ELEVATION



INSTALLED PLAN

GENERAL, TL-3 GUARDRAIL DETAILS



INSTALLED SECTION

NOTES:

- GENERAL: Install the Guardrail configuration where indicated in the plans per FDOT INDEX No. 400.  
Use 12'-6" W-Beam Panels. A single 6'-3" Panel may be used at the end of the run.
- MIDSPAN PANEL LAP SPLICE: For proper structural function, place all Lap Splices at midspan unless otherwise indicated.

PROJECT NUMBER: 39098614, CITY: TAMPA, Z:\Geotech\39098614\Projects\39098614\TECO\MSDP\Cleura\Drawings\CAD\2018\May\_2018\18048-FC-23AI.dwg, LAYOUT: SHEET 10, SAVED: 6/5/2018 10:48 AM, PLOTSTYLETABLE: CIVIL\_MASTER.CTB, PLOTTED: 6/20/2018 2:04 PM, BY: VIVES, MARTIN

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISION
0	6/20/18		

**amec foster wheeler**  
 Amec Foster Wheeler  
 Environment & Infrastructure, Inc.  
 1101 Channelside Drive, Suite 200, Tampa, FL 33602  
 Phone: 1.813.289.0750 Fax: 1.813.289.5474  
 www.amec.com Registration Number F-12

**TAMPA ELECTRIC CO.**  
**BIG BEND STATION**  
 BIG BEND COALFIELD STORMWATER RUNOFF (SLAG SETTLING) POND  
 GUARDRAIL DETAILS  
 APOLLO BEACH, FLORIDA

DATE: June 5, 2018  
 DRAWN BY: M. VIVES  
 CHECKED BY: T. DAY  
 PROJECT NO.: 300998



349-FC-23AI