From:	Proctor jr., Kennard
To:	SCO
Cc:	Seiler, Ann; Senn, Nate
Subject:	St. Lucie Power Plant - Post Certification Amendment Request-PA 74-02A2-PSL -Inductor Yard-06-15-2022
Date:	Wednesday, June 15, 2022 1:58:57 PM
Attachments:	Post Certification Amendment Request-PA 74-02A2-PSL -Inductor Yard-06-15-2022.pdf

EXTERNAL MESSAGE
This email originated outside of DEP. Please use caution when opening attachments, clicking links, or responding to this email.

Good afternoon,

Please find attached an Post Certification Amendment Request submittal for the planned construction of the Sandlot Inductor Switchyard at the FPL St. Lucie Power Plant. Please contact me if you have questions or need additional information. Thank you.

Sincerely,
Ken Proctor, PMP
Sr. Project Manager
Environmental Services
Florida Power & Light Company
Office: (561) 691-7068
Cell: (561) 267-9138

This transmission is intended to be delivered only to the named addressee(s) and may contain information that is confidential and/or legally privileged. If this information is received by anyone other than the named addressee(s), the recipient should immediately notify the sender by E-MAIL and by telephone (561) 691-7068 and permanently delete the original and any copy, including printout of the information. In no event shall this material be read, used, copied, reproduced, stored or retained by anyone other than the named addressee(s), except with the express consent of the sender or the named addressee(s).

June 15, 2022

Ms. Cindy Mulkey, Program Administrator
Siting Coordination Office
Florida Department of Environmental Protection
2600 Blairstone Road, MS #5500
Tallahassee, FL 32399-2400

Re: **Florida Power & Light Company**
St. Lucie Power Plant PA 74-02A2
Request for Post Certification Amendment
Sandlot Inductor Switchyard

Dear Ms. Mulkey:

Florida Power & Light Company (FPL) is requesting a post certification amendment to construct Sandlot 230 kV Inductor Switchyard (inductor switchyard, project) at the St. Lucie Power Plant (PSL). This post certification amendment to the Site Certification of PSL (Certification No. PA 74-02A2) is being requested pursuant to Section 403.5113(1)(a) Florida Statues (F.S.) and Rule 62-17.205 (1) Florida Administrative Code (F.A.C).

The proposed inductor switchyard will improve voltage control and will be electrically connected by a 230 kV overhead line to the existing St. Lucie switchyard that was previously expanded under post certification amendment AM15-101. The project will be located south of the existing switchyard (see Attachment A) and will include a 1.11-acre inductor yard, 0.19 acres of access driveway, an overhead 230 kV line, and stormwater management system (see Attachment B).

The stormwater management system has been designed to meet SFWMD/FDEP and County Stormwater Criteria for Water Quality, Water Quantity and Flood protection. The project will be served by a standalone 0.51-acre dry detention stormwater management system that is designed to serve only the proposed inductor switchyard facility and is not hydraulically connected to the existing switchyard system to the north. Environmental Resource Application Sections A and E and a full Stormwater Report with the detailed analysis for the project is included for your review (see Attachment C and D).

No in-water work will be needed for this project. No wetlands or listed threatened or endangered species will be impacted by this project.

This project will comply with the PSL Conditions of Certification, PA74-02A2, date modified September 17, 2008. FPL believes these proposed activities will not require any changes to the conditions of certification; therefore, we are requesting that this project be processed as an amendment.

Thank you for your consideration of FPL's request to amend PSL Site Certification No. PA 74-02A2. If you have any questions regarding this submittal, please do not hesitate to contact me at 561-691-7068 or Kennard.proctorjr@fpl.com.

Sincerely,
FLORIDA POWER & LIGHT COMPANY



Ken Proctor, Sr. Project Manager
Environmental Services

cc: Natalie Vitola, FPL

Attachment A – Aerial Exhibit (Project Location)
Attachment B – Construction Plans
Attachment C – ERP application sections A and E
Attachment D – Stormwater Report

Attachment A – Aerial Exhibit (Project Location)



ST. LUCIE COUNTY
SECTION 16, TOWNSHIP 36 SOUTH, RANGE 41 EAST

CULPEPPER & TERPENING INC
2980 SOUTH 25th STREET • FORT PIERCE, FLORIDA 34981
PHONE 772-464-3537 • FAX 772-464-9497 • www.ct-eng.com
STATE OF FLORIDA BOARD OF PROFESSIONAL
ENGINEERS AUTHORIZATION NO. 4286

FPL SANDLOT INDUCTOR YARD

AERIAL EXHIBIT

JOB NO: 21–197	SCALE: 1" = 150'
DRAWN BY: JKILLIAN	DATE: 6/13/2022

P:\Proj-2021\21-197 FPL - St. Lucie Inductor Yard\Eng\21-197 Aerial Exhibit.dwg 6/13/2022 11:37:33 AM

Attachment B – Construction Plans

CONSTRUCTION PLANS FOR

FPL SANDLOT INDUCTOR YARD

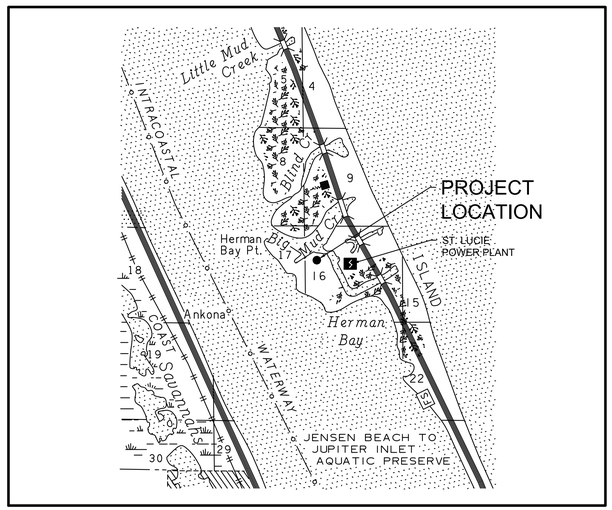
IN

SECTION 16, TOWNSHIP 36 SOUTH, RANGE 41 EAST

ST. LUCIE, FLORIDA

PREPARED FOR

FLORIDA POWER & LIGHT CO.



LOCATION MAP N.T.S.

SECTION 16, TOWNSHIP 36 SOUTH, RANGE 41EAST



VICINITY MAP N.T.S.

INDEX TO SHEETS	
SHEET NO.	DESCRIPTION
1	COVER
2	DEMOLITION PLAN
3	FENCE, FILL & GRADE PLAN
4	PAVING, GRADING & DRAINAGE DETAILS
5	PAVING, GRADING & DRAINAGE SECTIONS
6	SWPP PLAN
7	SWPPP DETAILS

REVISIONS	
SHEET NO.	DATE

SUBMITTAL DATE:

CULPEPPER & TERPENING INC

2980 SOUTH 25th STREET • FORT PIERCE, FLORIDA 34981

PHONE 772-464-3537 • FAX 772-464-9497 • www.ct-eng.com

STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

This item has been digitally signed and sealed by Joshua A. Killian, PE on Jun. 13, 2022 using a SHA authentication code. Printed copies of this document are not considered signed and sealed and the SHA authentication code must be verified on any electronic copies.

JOSHUA A. KILLIAN, P.E. FL. REG. NO. 85263

FILE NAME: 21-197 BASE.DWG

24X36 ENG 6/99



LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY
- EXIST. FENCE
- EXIST. FENCE TO BE REMOVED
- EXIST. TOP OF BANK
- EXIST. TOE OF SLOPE
- EXIST. CONTOUR
- OVERLAND FLOW DIRECTION
- EXIST. PAVED ASPHALT DRIVEWAY
- EXIST. PAVED ASPHALT DRIVEWAY TO BE REMOVED
- EXIST. CONCRETE PAVEMENT
- EXIST. CONCRETE PAVEMENT TO BE REMOVED
- EXIST. GRADE
- EXIST. ELECTRICAL BOX
- EXIST. LIGHTPOLE
- EXIST. SWALE
- EXIST. ELECTRICAL BOX TO BE REMOVED
- EXIST. LIGHTPOLE TO BE REMOVED

DATUM NOTES:
ALL ELEVATIONS AND BENCHMARKS SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM (N.A.V.D.) OF 1988.

811 Know what's below. Call before you dig.

CULPEPPER & TERPENING, INC. PROJECT NO. 21-197

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ER	NO	DATE	REVISION	BY	CH	COR	APP

DATE 5/24/22 SCALE 0 30 45 60 90

POWER SYSTEMS FPL

DR KJ	ER JK
CH .	COR .

APPROVED JOSHUA A. KILLIAN

FPL Sandlot Inductor Yard
DEMOLITION PLAN

(SU,G,PP)

SHEET 2 OF 7
E-STLØ2
CADE

REV NO

JOSHUA A. KILLIAN, P.E. FL. REG. NO. 85263
ENGINEER'S SEAL

24X36 ENG 6/99



DRAINAGE STRUCTURE TABLE	
STRUCTURE NAME	STRUCTURE DETAILS
MES-01 CONST. MES	E INV = 4.50
MES-02 CONST. MES	W INV = 4.40
MES-03 CONST. MES	W INV = 4.00

DRAINAGE STRUCTURE TABLE	
STRUCTURE NAME	STRUCTURE DETAILS
CS-1 TYPE 'E' INLET (MOD)	RIM = 6.00 SE INV = 0.50
SD-01 TYPE 'C' INLET	RIM = 10.50 SE INV = 4.64
SD-02 TYPE 'C' INLET	RIM = 10.50 NW INV = 4.43 SE INV = 4.43
SD-03 TYPE 'C' INLET	RIM = 10.50 NW INV = 4.21 SE INV = 4.21
SD-04 TYPE 'C' INLET	RIM = 8.21 NW INV = 4.10 E INV = 4.10
SD-05 Type E Inlet	RIM = 3.97 NW INV = 0.00

NOTES:

1. ELEVATIONS REFERENCED TO N.A.V.D. UNLESS OTHERWISE NOTED.
2. 7.9 DENOTES LOCATION AND ELEVATION OF EXISTING GRADE.
3. FINISHED GRADE ELEVATIONS WHICH INDICATE TOP OF BASE ROCK WHICH ARE TO BE COVERED WITH LOOSE ROCK OR ASPHALTIC CONCRETE DO NOT INCLUDE THE THICKNESS OF LOOSE ROCK OR ASPHALTIC CONCRETE AND ARE SHOWN AS XX.XX
4. ELEVATIONS WHICH INDICATE TOP OF FILL OR CUT THAT ARE TO BE SODDED ARE THE PROPOSED ELEVATIONS OF THE TOP OF SOD AND ARE SHOWN AS XX.X
5. ~→ INDICATES DIRECTION OF FLOW OF STORMWATER RUNOFF.
6. ALL CLEARING, EXCAVATING, FILLING, GRADING, PAVING AND DRAINAGE SHALL BE PERFORMED IN CONFORMANCE WITH FPL D-2 SPECIFICATION.
7. GRASSING SHALL BE FURNISHED AND INSTALLED IN CONFORMANCE WITH THE APPROVED LANDSCAPE PLAN. ALL DISTURBED AREAS NOT SHOWN TO BE PLANTED, MULCHED, ETC. SHALL BE SODDED.
8. EROSION AND SEDIMENT CONTROL TO BE PROVIDED BY SODDING OF EMBANKMENTS, RETENTION/DETENTION FACILITIES AND DISTURBED AREAS AT LOCATIONS SHOWN.
9. FPL SHALL ASSUME RESPONSIBILITY FOR MAINTENANCE OF THE STORMWATER FACILITIES WITHIN FPL PROPERTY UPON COMPLETION AND ACCEPTANCE BY THE COMPANY REPRESENTATIVE.
10. THE EXISTING RELAY VAULT FINISH FLOOR ELEVATION IS 11.67 NAVD.
11. THE SECURITY FENCE SHALL BE 14'-0" BALLISTIC PRECAST CONCRETE WALLS WITH 12'-0" EXPOSED AND 2'-0" BURIED BELOW GRADE AND SHALL BE IN ACCORDANCE WITH FPL STANDARDS UNLESS OTHERWISE NOTED.
12. STORMWATER MANAGEMENT DESIGN DATA:

TOTAL BASIN AREA	5.45	ACRES
IMPERVIOUS AREAS:		
PROP. BUILDING	0.02	ACRES
PROP. PAVED DRIVEWAY	1.12	ACRES
PROP. SUBSTATION YARD	1.09	ACRES
TOTAL IMPERVIOUS	2.23	ACRES
PERVIOUS AREAS:		
PROP. DRY DETENTION	0.51	ACRES
OPEN SPACE	2.71	ACRES
TOTAL PERVIOUS	3.22	ACRES

13. SOD SHALL BE PLACED SUCH THAT THE TOP OF THE GRASS IS AT THE SAME ELEVATION AS THE TOP OF ADJACENT COMPACTED FILL.
14. THE STORMWATER MANAGEMENT DESIGN IS BASED ON ST. LUCIE COUNTY, AND FDEP/SFWMD CRITERIA.
15. THE LOCATION AND INVERTS OF THE EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE APPROXIMATE. ALL UTILITIES SHALL BE FIELD LOCATED BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
16. MAINTENANCE OF TRAFFIC SHALL BE IN CONFORMANCE WITH FDOT SPECIFICATIONS.
17. THESE PLANS SHALL NOT BE UTILIZED FOR CONSTRUCTION UNLESS THEY ARE MARKED "APPROVED FOR CONSTRUCTION" IN THE TITLE BLOCK.
18. GEOTECHNICAL EXPLORATION PERFORMED BY ARDAMAN & ASSOCIATES, INC., DATED OCTOBER 13, 2013. THE CONTRACTOR IS DIRECTED TO THE SITE PREPARATION SECTION OF THE REPORT AND ADVISED THAT COMPLIANCE WITH THE INSTRUCTION IN THAT SECTION IS REQUIRED.
19. FIELD TESTING
    A. PAVING SUBGRADE TO BE TESTED FOR DENSITY EVERY 10,000 SQ. FT. OR PORTION THEREOF AND ONE LBR TEST SHALL BE TAKEN IN AREA OF ASPHALT.
    B. PAVING BASE AND YARD BASE TO BE TESTED FOR DENSITY EVERY 10,000 SQ. FT. OR PORTION THEREOF. PIT CERTIFICATION (FDOT) WILL BE SATISFACTORY FOR EVIDENCE OF LBR.
20. LAYOUT BENCHMARKS

    SUBSEQUENT TO FINAL GRADING OF THE LBR70 BASE INSIDE THE FENCE, THE CONTRACTOR SHALL INSTALL TWO (PERMANENT CONCRETE MONUMENT) BENCHMARKS INSIDE THE FENCE AS A REFERENCE FOR OTHER WORK. THE BENCH MARKS SHALL BE LOCATED A DISTANCE OF 4' FROM THE PROPOSED SECURITY FENCE. THE LOCATIONS ARE SHOWN ON THESEPLANS. THE BENCHMARKS SHALL INCLUDE VERTICAL (SAME DATUM AS ORIGINAL SURVEY) AND HORIZONTAL (STATE PLANE COORDINATES) REFERENCES. BENCHMARK ELEVATIONS ARE TO BE SET AT DESIGN GRADE PLUS TWO INCHES. THE INFORMATION SHALL BE POSTED IN THE RELAY VAULT AND SHOWN ON THE AS-BUILT DRAWINGS.
21. CONTRACTOR TO REVIEW ALL PERMITS PRIOR TO STARTING CONSTRUCTION.
22. DRAWING SCALE MAY CHANGE DUE TO REPRODUCTION.
23. DIMENSIONS SHOWN PERPENDICULAR TO PROPERTY LINE UNLESS OTHERWISE NOTED.
24. BOUNDARY AND TOPOGRAPHIC INFORMATION PROVIDED BY CULPEPPER & TERPENING, INC., DATED APRIL 8, 2022.
25. ALL DISTURBED AREAS SHALL BE SODDED UNLESS NOTED OTHERWISE IN THE PLANS. SLOPES GREATER THAN 3:1 SHALL BE PINNED. SODDING, SEED AND MULCH SHALL MEET THE REQUIREMENTS OF FDOT STANDARD SPECIFICATIONS SECTIONS 570 AND 981.

LEGEND

- PROP. ASPHALT DRIVEWAY
- PROP. SUBSTATION LOOSE ROCK
- EXIST. ASPHALT
- PROP. CONCRETE
- EXIST. GRADE
- OVERLAND FLOW DIRECTION
- PROPERTY LINE
- RIGHT-OF-WAY
- EXIST. FENCE
- PROP. FENCE
- TOB PROP. TOP OF BANK
- TOE PROP. TOE OF SLOPE
- EXIST. SWALE
- PROP. SWALE REALIGNMENT
- 10 PROP. MAJOR CONTOUR
- 9 PROP. MINOR CONTOUR

DATUM NOTES:
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PHONE 772-464-3537 • FAX 772-464-9497 • www.ct-eng.com
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ER	NO	DATE	REVISION	BY	CH	COR	APP

DATE 5/24/22 SCALE 0 30 45 60 90

POWER SYSTEMS FPL

DR KJ	ER JK
CH .	COR .

APPROVED JOSHUA A. KILLIAN

FPL SANDLOT INDUCTOR YARD
FENCE, FILL & GRADE PLAN

(SU,G,PP)

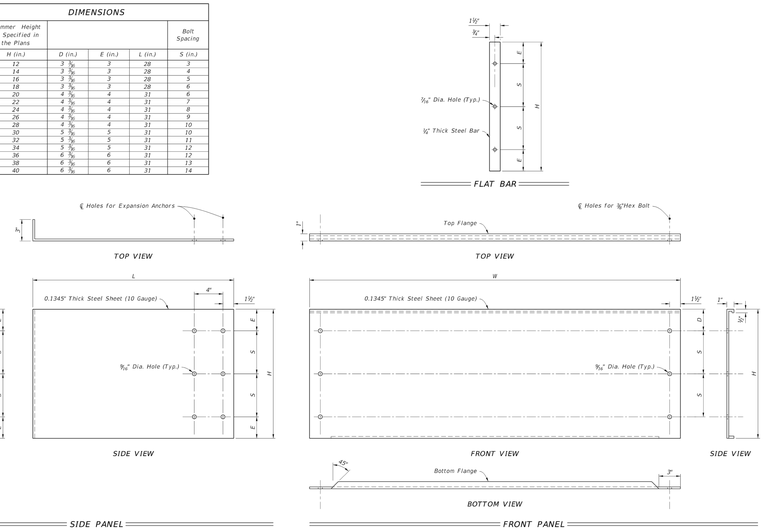
SHEET 3 OF 7
E-STL02
CADE

REV NO

JOSHUA A. KILLIAN, P.E. FL. REG. NO. 85263
ENGINEER'S SEAL

24X36 ENG 6/99

DIMENSIONS				
Skimmer Height as Specified in the Plans				Bolt Spacing
H (in.)	D (in.)	E (in.)	L (in.)	S (in.)
12	3 3/8	3	28	3
14	3 3/8	3	28	4
16	3 3/8	3	28	5
18	3 3/8	3	28	6
20	4 3/8	4	31	6
22	4 3/8	4	31	7
24	4 3/8	4	31	8
26	4 3/8	4	31	9
28	4 3/8	4	31	10
30	5 3/8	5	31	10
32	5 3/8	5	31	11
34	5 3/8	5	31	12
36	6 3/8	6	31	12
38	6 3/8	6	31	13
40	6 3/8	6	31	14



PANEL AND FLAT BAR DETAILS

LAST REVISION 11/01/20	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	SKIMMER FOR OUTLET CONTROL STRUCTURES	INDEX 425-070	SHEET 2 of 3

SKIMMER FOR OUTLET CONTROL STRUCTURES
N.T.S.

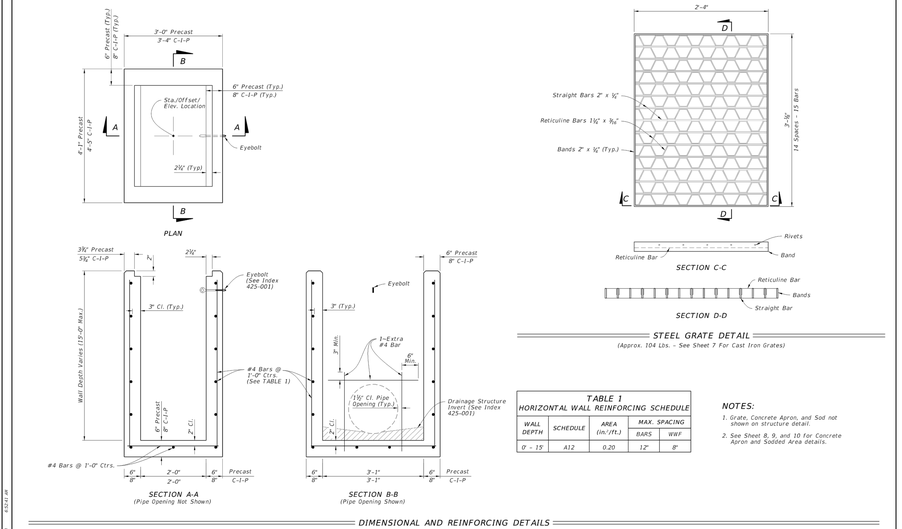


TABLE 1
HORIZONTAL WALL REINFORCING SCHEDULE

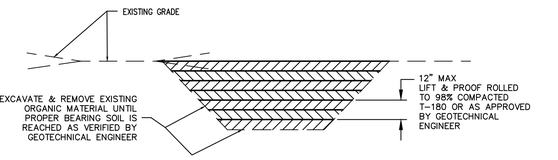
WALL DEPTH	SCHEDULE	AREA (in²/ft.)	MAX. SPACING BARS	MAX. SPACING WWF
0' - 15'	A12	0.20	12"	8"

NOTES:
1. Grate, Concrete Apron, and Sod not shown on structure detail.
2. See Sheet 8, 9, and 10 For Concrete Apron and Sodded Area details.

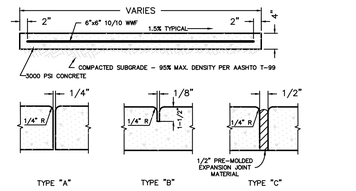
DIMENSIONAL AND REINFORCING DETAILS

TYPE C - DIMENSIONAL, REINFORCING, AND STEEL GRATE DETAILS

LAST REVISION 11/01/20	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	DITCH BOTTOM INLET TYPE C, D, E, AND H	INDEX 425-052	SHEET 2 of 14



TYPICAL FILL & COMPACTION DETAIL
N.T.S.



SIDEWALK JOINTS

TABLE OF SIDEWALK JOINTS	
TYPE	LOCATION
"A"	AT P.C. AND P.T. OF CURVES AND AT JUNCTION OF EXISTING AND NEW SIDEWALKS.
"B"	5'-0" CENTER TO CENTER ON NEW SIDEWALKS.
"C"	WHERE NEW SIDEWALK ABUTS CONCRETE CURBS, DRIVEWAYS AND SIMILAR STRUCTURES

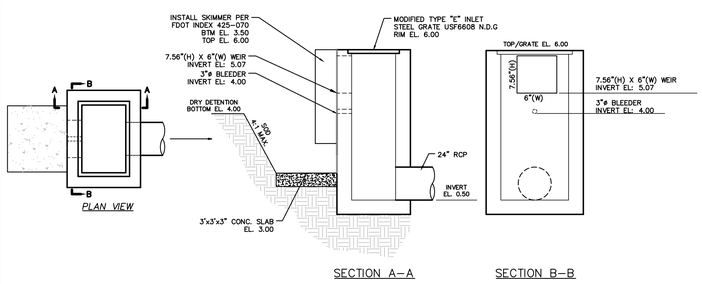
SIDEWALK CONSTRUCTION



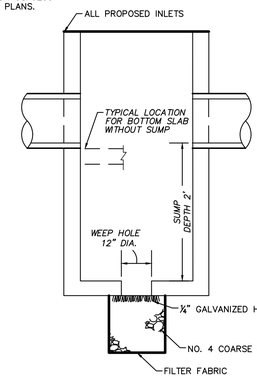
SIDEWALK CONSTRUCTION DETAILS
N.T.S.

NOTES:
1. ALL INLET GRATES SHALL BE CAST IRON USF6209 H-20 UNLESS SHOWN OTHERWISE IN THE PLANS.

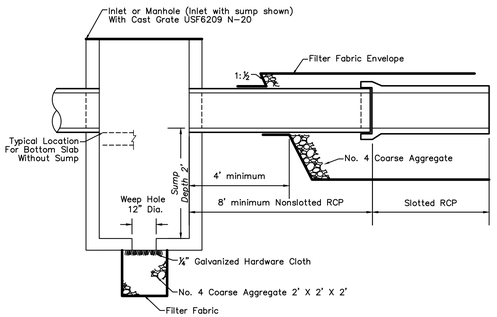
TYPE 'C' INLET
N.T.S.



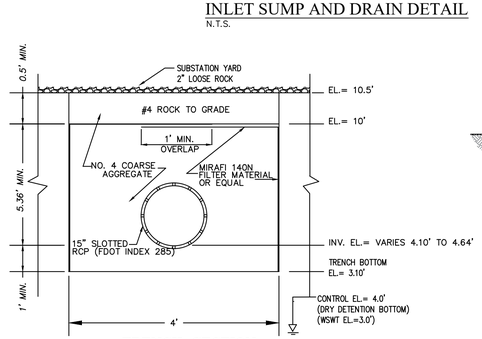
OUTFALL CONTROL STRUCTURE CS-01 DETAIL
N.T.S.



INLET SUMP AND DRAIN DETAIL
N.T.S.

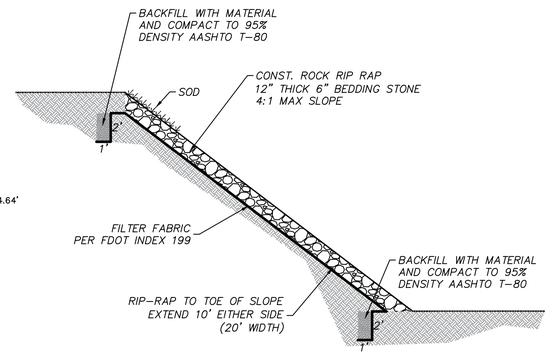


LONGITUDINAL SECTION

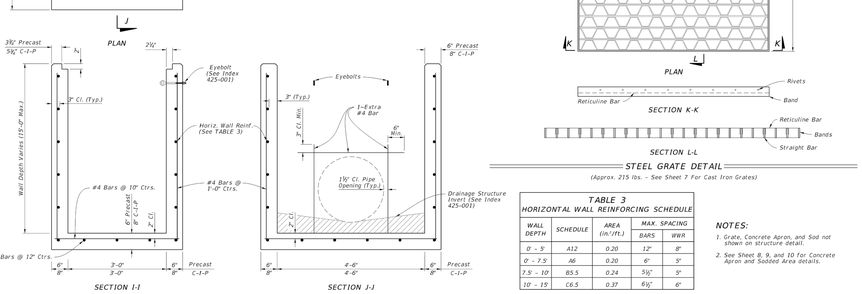


TRENCH SECTION
NOTES: 1. FRENCH DRAIN TO BE CONSTRUCTED IN CONFORMANCE WITH FDOT INDEX 285
2. LENGTH OF TRENCH EQUALS LENGTH OF SLOTTED PIPE

FRENCH DRAIN & PIPE CONNECTION DETAIL
N.T.S.



RIPRAP SLOPE PROTECTION DETAIL
N.T.S.



DIMENSIONAL AND REINFORCING DETAILS

TYPE E - DIMENSIONAL, REINFORCING, AND STEEL GRATE DETAILS

TABLE 3
HORIZONTAL WALL REINFORCING SCHEDULE

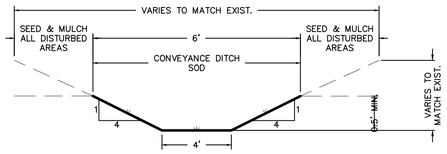
WALL DEPTH	SCHEDULE	AREA (in²/ft.)	MAX. SPACING BARS	MAX. SPACING WWR
0' - 5'	A12	0.20	12"	8"
0' - 7.5'	A6	0.20	6"	5"
7.5' - 10'	B5.5	0.24	5½"	5"
10' - 13'	C6.5	0.37	6½"	6"

NOTES:
1. Grate, Concrete Apron, and Sod not shown on structure detail.
2. See Sheet 8, 9, and 10 for Concrete Apron and Sodded Area details.

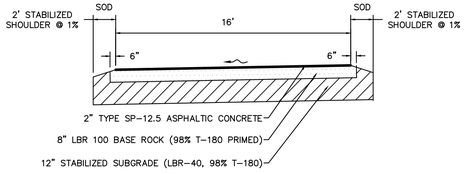
LAST REVISION 11/01/20	DESCRIPTION:	FDOT FY 2021-22 STANDARD PLANS	DITCH BOTTOM INLET TYPE C, D, E, AND H	INDEX 425-052	SHEET 4 of 14

TYPE 'E' INLET
N.T.S.

NOTES:
1. ALL INLET GRATES SHALL BE CAST IRON USF6209 H-20 UNLESS SHOWN OTHERWISE IN THE PLANS.



CONVEYANCE SWALE
N.T.S.



DRIVEWAY TYPICAL SECTION
N.T.S.

DATUM NOTES:
ALL ELEVATIONS AND BENCHMARKS SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM (N.A.V.D.) OF 1988.

CULPEPPER & TERPENING, INC. PROJECT NO. 21-197

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ER	NO	DATE	REVISION	BY	CH	COR	APP

DATE 5/24/22 SCALE

POWER SYSTEMS FPL

DR KJ	ER JK
CH .	COR .

APPROVED JOSHUA A. KILLIAN

FPL SANDLOT INDUCTOR YARD
PAVING, GRADING & DRAINAGE DETAILS

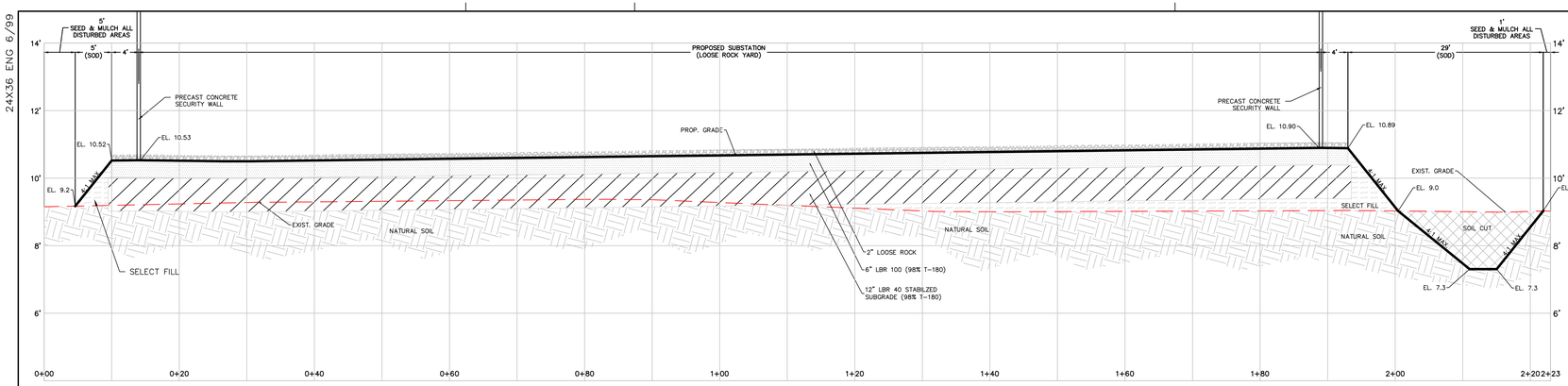
(SU,G,PP)

SHEET 4 OF 7
E-STLØ2
CADE

REV NO

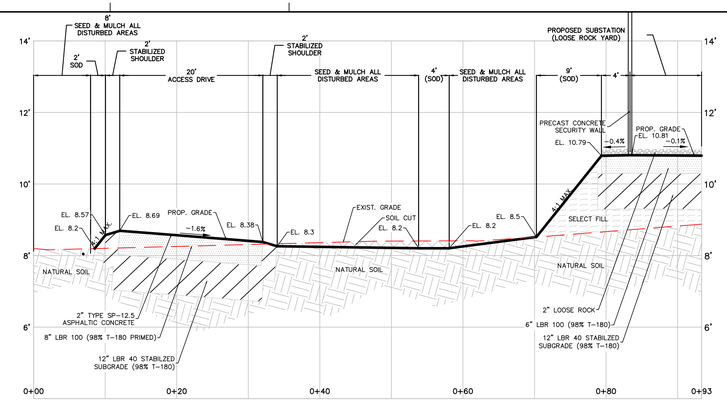
JOSHUA A. KILLIAN, P.E. FL. REG. NO. 85263
ENGINEER'S SEAL

24X36 ENG 6/99



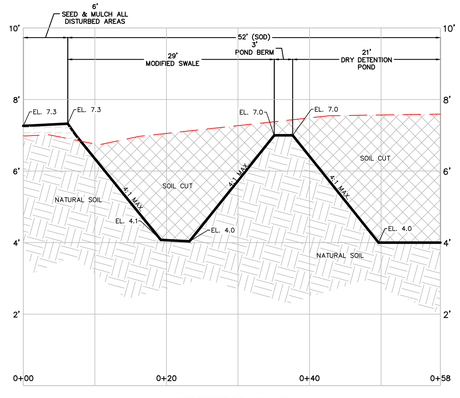
SECTION A–A

H. SCALE: 1"=10'
V. SCALE: 1"=2'



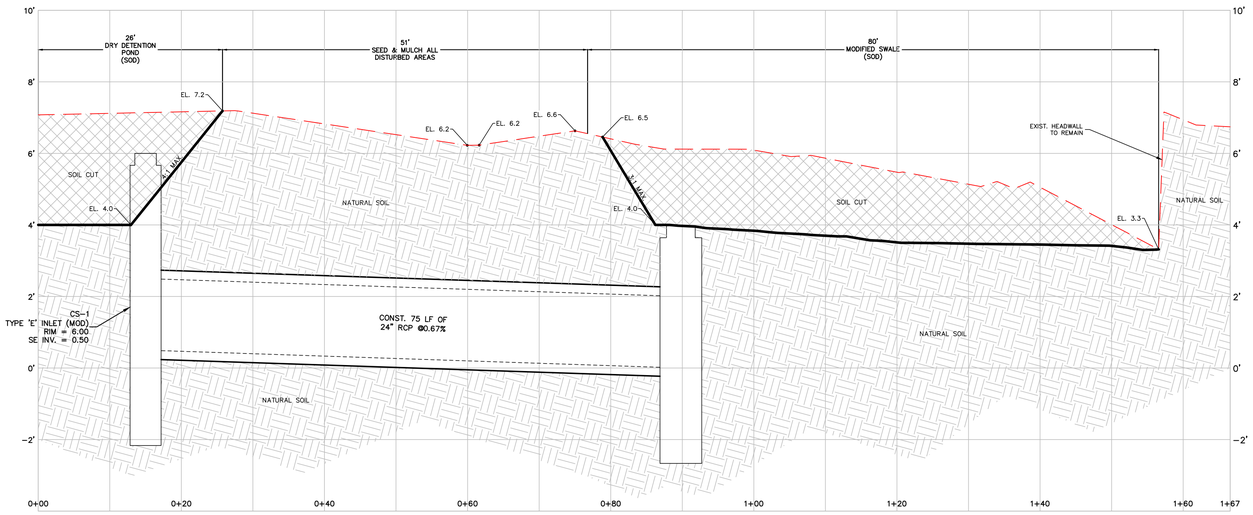
SECTION B–B

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V. SCALE: 1"=2'



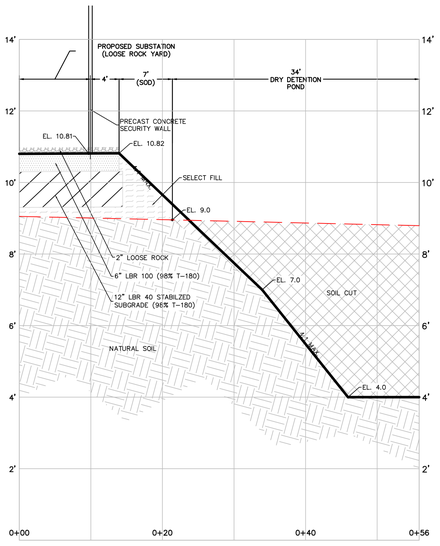
SECTION D–D

H. SCALE: 1"=10'
V. SCALE: 1"=2'



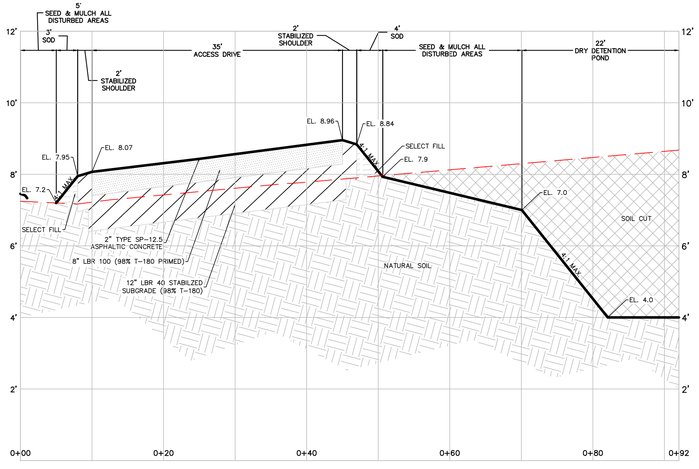
SECTION E–E

H. SCALE: 1"=10'
V. SCALE: 1"=2'



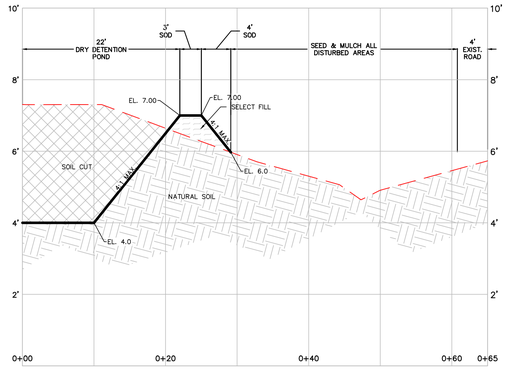
SECTION C–C

H. SCALE: 1"=10'
V. SCALE: 1"=2'



SECTION F–F

H. SCALE: 1"=10'
V. SCALE: 1"=2'



SECTION G–G

H. SCALE: 1"=10'
V. SCALE: 1"=2'

CULPEPPER & TERPENING, INC. PROJECT NO. 21–197

DATUM NOTES:
ALL ELEVATIONS AND BENCHMARKS SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM (N.A.V.D.) OF 1988.

CULPEPPER & TERPENING INC
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PHONE 772-464-3537 • FAX 772-464-9497 • www.ct-eng.com
STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

ER	NO	DATE	REVISION	BY	CH	COR	APP

DATE 5/24/22 SCALE —

POWER SYSTEMS FPL

DR KJ	ER JK
CH .	COR .

APPROVED
JOSHUA A. KILLIAN

FPL SANDLOT INDUCTOR YARD PAVING, GRADING & DRAINAGE SECTIONS

(SU,G,PP)

SHEET 5 OF 7
E-STLØ2
CADE

REV NO

JOSHUA A. KILLIAN, P.E. FL. REG. NO. 85263
ENGINEER'S SEAL

24X36 ENG 6/99

PROVIDE DRIVEWAY SWEEPING AS NEEDED PER FLORIDA EROSION AND SEDIMENT CONTROL MANUAL

0 30 45 60 90
SCALE 1"=30'

1,500'± TO PROPERTY LINE

CONCRETE POWER POLE

EXIST. CONC. BOLLARD (TYPICAL)

SITE BENCHMARK
T&T TRAVERSE POINT
MAG NAIL & DISK
N=1099606.39
E=1699606.39
EL=16.49' NAVD

CONCRETE PAD

GATE POST

AREA LIGHT (TYPICAL)

CHAIN LINK FENCE

EXIST. SWALE

EXIST. CONCRETE SWALE

TOE 30'

TOB 10'

SD-01

INSTALL INLET PROTECTION PER FLORIDA EROSION & SEDIMENT CONTROL MANUAL (TYP.)

CONST. 108 LF OF 18" RCP @ 0.20%

SD-02

SD-03

CONST. 57 LF OF 18" RCP @ 0.20%

CONST. 49 LF OF 18" RCP @ 0.20%
INV. 4.00

MES-03

MES-01

MES-02

CONST. 80 LF OF 14" x 23" RCP @ 0.12%

CS-1

CONST. 71 LF OF 24" RCP @ 0.67%

SD-05

12" CPP INV. EL.=4.48'

12" CPP INV. EL.=4.58'

18" CMP INV. EL.=3.32'

INSTALL SOIL TRACKING PREVENTION DEVICE PER FLORIDA EROSION AND SEDIMENT CONTROL MANUAL

INSTALL SILT FENCE PER FLORIDA EROSION & SEDIMENT CONTROL MANUAL V=40 (TYP.) (LIMITS OF CLEARING)

Florida Power and Light Company
Parcel ID: 3508-111-0002-000-3

LEGEND

- PROP. SUBSTATION LOOSE ROCK
- PROP. SOIL TRACKING PREVENTION
- EXIST. GRADE
- OVERLAND FLOW DIRECTION
- PROP. SILT FENCE
- PROPERTY LINE
- RIGHT-OF-WAY
- EXIST. FENCE
- PROP. FENCE
- TOB PROP. TOP OF BANK
- TOE PROP. TOE OF SLOPE

DATUM NOTES:
ALL ELEVATIONS AND BENCHMARKS SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM (N.A.V.D.) OF 1988.

811 Know what's **below.** **Call** before you dig.

CULPEPPER & TERPENING, INC. PROJECT NO. 21-197

CULPEPPER & TERPENING INC
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PHONE 772-464-3537 • FAX 772-464-9497 • www.ct-eng.com
STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

ER	NO	DATE	REVISION	BY	CH	COR	APP

DATE 5/24/22 SCALE 0 30 45 60 90

POWER SYSTEMS FPL

DR KJ	ER JK
CH .	COR .

APPROVED
JOSHUA A. KILLIAN

FPL SANDLOT INDUCTOR YARD
SWPP PLAN

(SU,G,PP)

SHEET 6 OF 7
E-STLØ2
CADE

REV NO

JOSHUA A. KILLIAN, P.E. FL. REG. NO. 85263
ENGINEER'S SEAL

24X36 ENG 6/99

Project Name and location information:	Sandlot Inductor Yard Section 16 / Township 36S / Range 41E St. Lucie County, Florida Paced ID No. 3508-111-0002-000-3
Describe the nature of the construction activity:	Distribution Electric Inductor Yard
Describe the intended sequence of major soil disturbing activities:	• 0-2 days, site prep and stabilized construction entrance; • 3-6 days, install perimeter sediment and erosion controls; • 3-10 days, install stormwater detention basin • 7-10 days, clearing/grubbing over all areas except those that are designated as buffers/conservation easements; • 11-13 days, site grading; • 14-30 days, install storm sewer infrastructure; • 14-42 days, yard expansion; • 42-90 days, stabilize site; • 90-120 days, clean out sediments in detention basin, bring to final design grades, deep rake to reduce compaction, and vegetate
Total area of the site:	212.16 Acres
Total area of the site to be disturbed:	2.50 Acres
Existing data describing the soil or quality of any stormwater discharge from the site:	Existing soil type is primarily Arents, well drained, 45-65% slopes.
Estimate the drainage area size for each discharge point:	5.45 Acres Undeveloped property south of the project site.
Latitude and longitude of each discharge point and identify the receiving water or MS4 for each discharge point:	1. LAT : 27° 20' 38.31" LON: -80° 14' 48.94" The site discharges to the Undeveloped property south of the project site.

Give a detailed description of all controls, Best Management Practices (BMPs) and measures that will be implemented at the construction site for each activity identified in the intended sequence of major soil disturbing activities section. Provide time frames in which the controls will be implemented.
NOTE: All controls shall be consistent with performance standards for erosion and sediment control and stormwater treatment set forth in s. 62-40.432, F.A.C., the applicable Stormwater or Environmental Resource Permitting requirements of the Department or a Water Management District, and the guidelines contained in the State of Florida Erosion and Sediment Control Designer and Reviewer Manual, FDOT, FDEP (2007) and any subsequent amendments.

• Prior to clearing, a silt fence (trenched 6 inches deep and backfilled on the uphill side), shall be installed around the perimeter of the site.
• During the clearing, grubbing and site grading stages, areas that are disturbed more than 7 days shall be stabilized with rye grass or other appropriate temporary vegetation applied at manufacturer's recommendations. After seeding, each area shall be mulched with 4,000 pounds of straw per acre. On all exposed slopes that are equal to or greater than 5%, an Erosion Blanket® shall be used until the area achieves final stabilization.
• A rock entrance road (that is 50ft long with a 6 inch depth of FDOT #1 stone and lined with filter fabric) shall be constructed to minimize the effects of truck traffic and sedimentation tracking both on and off of the site. There will be only one construction entrance at this site.
• After the initial site grading work, all proposed inlet(s)/outfalls, once installed, shall be protected from erosion and sediment runoff by the use of filter fabric and properly installed geohay inlet filters. Disturbed portions of the site where construction activities have permanently ceased shall be stabilized with sod or other permanent stabilization methods (if other methods are used, this SWPPP will be modified) no later than 14 days after the last construction activity. Seeding shall be the same as in temporary seeding.
• All installation shall be commenced as depicted on the attached site map and installation "typicals" sheet.

Describe all temporary and permanent stabilization practices. Stabilization practices include temporary seeding, mulching, permanent seeding, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, vegetative preservations, etc.

• Temporary seeding shall be rye grass or other appropriate ground covers depending upon season of installation that is applied at manufacturer's recommendations to any disturbed areas that are inactive more than 7 days.
• Sod shall be used to stabilize the sides of the detention basin.

Describe all structural controls to be implemented to divert stormwater flow from exposed soils and structural practices to store flows, retain sediment on-site or in any other way limit stormwater runoff. These controls include silt fences, earth dikes, diversions, swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, coagulating agents and temporary or permanent sediment basins.

• A silt fence (with the same installation as indicated under the Best Management Practices heading) shall be placed around the entire perimeter.
• A rock entrance road (that is 50ft long with a 6 inch depth of FDOT #1 stone and lined with filter fabric) shall be constructed to minimize the effects of truck traffic and sedimentation tracking both on and off of the site. There will be only one construction entrance at this site.
• Once constructed, the proposed detention basin may be used as a temporary sediment basin if needed. Care shall be taken to assure the removal of accumulated fine sediments and that the excessive compaction of soil by construction machinery is avoided.
After final site stabilization, the basin bottom shall be deep raked to restore infiltration rates and seeded and mulched.
• Inlet(s)/Outfalls shall be protected with filter fabric and silt fence (with the same installation as indicated under the Best Management Practices heading).

Describe all sediment basins to be implemented for areas that will disturb 10 or more acres at one time. The sediment basins (or an equivalent alternative) should be able to provide 3,600 cubic feet of storage for each acre drained. Temporary sediment basins (or an equivalent alternative) are recommended for drainage areas under 10 acres.

Not applicable as less than 10 acres will be disturbed.

Describe all permanent stormwater management controls such as, but not limited to, detention or retention systems or vegetated swales that will be installed during the construction process.

• One stormwater dry detention area expansion shall be constructed per state, county and local agency requirements.

Waste disposal, this may include construction debris, chemicals, litter, and sanitary wastes:	All construction materials and debris will be placed in a dumpster and hauled off site to a landfill or other proper disposal site. No materials will be buried on site.

Offsite vehicle tracking from construction entrances/exits:	Off site vehicle tracking of sediments and dust generation will be minimized via an soil tracking prevention device per Florida Erosion & Sediment Control Manual.
The proper application rates of all fertilizers, herbicides and pesticides used at the construction site:	Florida-friendly fertilizers and pesticides will be used at a minimum and in accordance with the manufacturer's suggested application rates. No fertilizers and pesticides will be stored on site.
The storage, application, generation and migration of all toxic substances:	A spill prevention plan is in place. All paints and other chemicals will be stored in a locked covered shed.
Other:	Port-o-lets will be placed away from storm sewer systems, storm inlet(s), surface waters and wetlands. Specific placement is depicted on the site map. No vehicle maintenance shall be conducted on-site. A washdown area shall be designated at all times and will not be located in any area that will allow for the discharge of polluted runoff. A small-vegetated berm shall be placed around the washdown area.

Provide a detailed description of the maintenance plan for all structural and non-structural controls to assure that they remain in good and effective operating condition.

Contractor shall provide routine maintenance of permanent and temporary sediment and erosion control features in accordance with the technical specifications or as follows, whichever is more stringent:
• Silt fence shall be inspected at least weekly. Any required repairs shall be made immediately. Sediment deposits shall be removed when they reach approximately one-half the height of the barrier.
• Maintenance shall be performed on the rock entrance when any void spaces are full of sediment.
• Inlet(s)/outfalls shall be inspected immediately after each rain event and any required repairs to the silt fence or filter fabric shall be performed immediately.
• Bare areas of the site that were previously seeded shall be reseeded per manufactures' instructions.
• Mulch and sod that has been washed out shall be replaced immediately.
• Maintain all other areas of the site with proper controls as necessary.

Inspections: Describe the inspection and inspection documentation procedures, as required by Part V.D.4. of the permit. Inspections must occur at least once a week and within 24 hours of the end of a storm event that is 0.50 inches or greater (see attached form).

Qualified personnel will inspect all points of discharges, all disturbed areas of construction that have not been stabilized, constructed areas and locations where vehicles enter and exit the site, and all BMPs at least once every 7 calendar days or within 24 hours of the end of a rainfall event that is 0.5 inches or greater. Where sites have been finally stabilized, said inspections shall be conducted at least once every month until the Notice of Termination is filed.

Identify and describe all sources of non-stormwater discharges as allowed in Part IV.A.3. of the permit. Flows from fire fighting activities do not have to be listed or described.

It is expected that the following non-stormwater discharges may occur from the site during construction period: water from well drilling operations, pavement wash water (where no spills or leaks of toxic or hazardous materials have occurred), and uncontaminated groundwater (from dewatering excavation). Dewatering shall be done in accordance with the requirements of the DEP Generic Permit for the Discharge of Produced Ground Water from any Noncontaminated Site Activity. If said discharges do occur, they will be directed to the temporary sediment basin prior to discharge. Turbid water from the stormwater pond shall not be pumped directly into the receiving waters. Any pumped water from the stormwater pond shall be treated so as to not allow a discharge of polluted stormwater. Treatment can include silt fences, settling ponds, the proper use of flocculating agents or other appropriate means.

All contractor(s) and subcontractor(s) identified in the SWPPP must sign the following certification:

"I certify under penalty of law that I understand, and shall comply with, the terms and conditions of the State of Florida Generic Permit for Stormwater Discharge from Large and Small Construction Activities and this Stormwater Pollution Prevention Plan prepared thereunder."

Name	Title	Copany Name, Address and Phone Number	Date

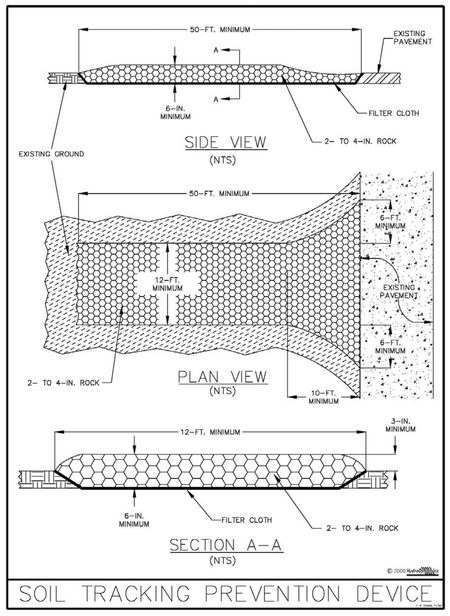


Figure V-14: Illustration of a Soil Tracking Prevention Device

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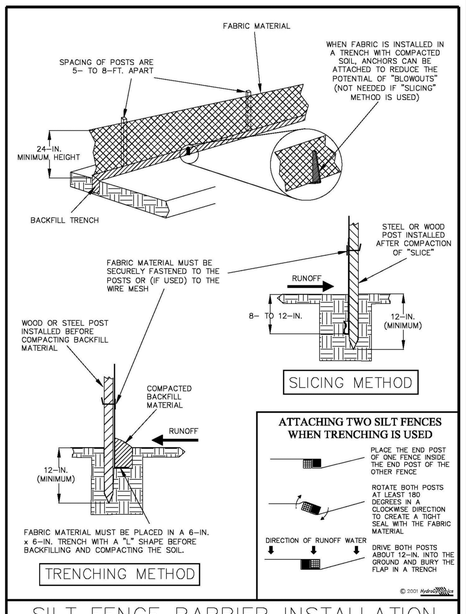
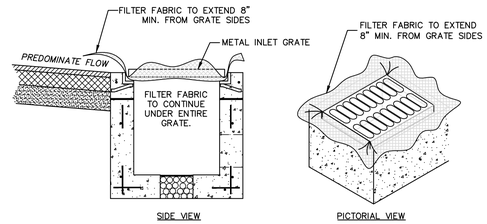


Figure V-40: Illustration of a Silt Fence Barrier

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GENERAL NOTES:
1. THIS INLET IS DESIGNED WITH FILTER FABRIC PROTRUDING 8" FROM SIDES FOR GRIPPING WHEN SEDIMENT NEEDS TO BE CLEARED AFTER FINAL CONSTRUCTION.
2. FILTER FABRIC TO BE INSTALLED AND TRIMMED BEFORE GRATE IS INSET.

INLET PROTECTION FILTER FABRIC DETAIL
N.T.S.

CULPEPPER & TERPENING, INC. PROJECT NO. 21–197

CULPEPPER & TERPENING INC
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STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

ER	NO	DATE	REVISION	BY	CH	COR	APP

DATE 5/24/22 SCALE

POWER SYSTEMS

DR KJ	ER JK
CH .	COR .

APPROVED
JOSHUA A. KILLIAN

FPL SANDLOT INDUCTOR YARD
SWPPP DETAILS

(SU,G,PP)

SHEET 7 OF 7
E-STLØ2
CADE

REV NO

JOSHUA A. KILLIAN, P.E. FL. REG. NO. 85263
ENGINEER'S SEAL

Attachment C – ERP application sections A and E

Application for
Individual and Conceptual Approval
Environmental Resource Permit,
State 404 Program Permit,
and Authorization to Use State-Owned
Submerged Lands

Florida Department of Environmental Protection/

Water Management Districts

Effective 12/22/2020

Instructions for Use of This Form:

This form is designed to assist you in submitting a complete application. All applications must include Section A-General Information for All Activities. Sections B through H list typical information that is needed based on the proposed activities and are only required as applicable. Part 1-C of Section A will guide you to the correct sections needed based on your proposed activities. Applicants are advised to consult Chapter 62-330, F.A.C., and the Environmental Resource Permit Applicant's Handbook Volumes I and II for information regarding the ERP permitting process and requirements while preparing their application. Internet addresses for Chapter 62-330, F.A.C., and the Applicant's Handbook, Agency contact information, and additional instructions for this form can be found in Attachment 1.

What Sections of the Application Must I Fill Out?

Type of Activity	Section A	Section B	Section C	Section D	Section E	Section F	Section G	Section H	Section I
Fill in wetlands or waters for a single family residence?	Y	Y	N	N	N	N	N	N	Y, if in assumed waters
Docks, shoreline stabilization, seawalls associated with a single family residence?	Y	Y	N	N	N	Y, as needed	N	N	Y, if in assumed waters
Wetland impacts (other than association with an individual residence)?	Y	N	Y	N	N	N	N	N	Y, if in assumed waters
Boating facilities, a marina, jetty, reef, or dredging?	Y	N	Y	Y	N	Y, as needed	N	N	Y, if in assumed waters
Any work on state owned submerged land?	Y	N	Y	N	N	Y	N	N	Y, if in assumed waters
Construction of a stormwater management system?	Y	N	Y, as needed	N	Y	N	N	N	N
Constructing a mitigation bank?	Y	N	Y	N	Y, as needed	N	Y	N	Y, if in assumed waters
Creating a mine?	Y	N	Y, as needed	N	N	N	N	Y	Y, if in assumed waters

If you have any questions, or would like assistance completing this form, please contact the staff of the nearest office of either the Florida Department of Environmental Protection (DEP) or a Water Management District (WMD) (see Attachment 2).

Section A:
General Information for All Activities

Part 1: Name, Application Type, Location, and Description of Activity

A. Name of project, including phase if applicable: **FPL Sandlot Inductor Yard**

B. This is for (check all that apply):

☒ Construction and operation of **new** works, activities, and/ or a stormwater management system

☐ **Conceptual Approval** of proposed works, activities and/ or a stormwater management system

☐ Modification or alteration of **existing** works, activities, and/or a stormwater management system. Provide the existing DEP or WMD permit #, if known: Note: Minor modifications do not require completion of this form, and may instead be requested by letter in accordance with section 6.2 of Applicant's Handbook Volume I.

☐ **Maintenance or repair** of works, activities, and/ or a stormwater management system previously permitted by the DEP or WMD. Provide existing permit #, if known:

☐ Abandonment or removal of works, activities, and/ or a stormwater management system.

Provide existing DEP or WMD permit #, if known:

☐ Operation of an **existing unpermitted** work, activity, and/or stormwater management system.

☐ Construction of additional phases of a permitted work, activity, or system.

Provide the existing DEP or WMD permit #, if known:

☐ A State 404 Program authorization: **A State 404 Permit is not required for this project. All proposed work is within uplands.**

☐ Exemption ☐ General Permit ☐ Individual Permit

If requesting an Exemption or General Permit provide Rule #, if known:

☐ **By checking this box**, I hereby voluntarily waive, in accordance with Rule 62-330.090(8), F.A.C., the agency action deadlines in section 5.5.3 of Volume I in the event my project also requires a State 404 Program authorization (other than an exemption) under Chapter 62-331, F.A.C., and request that the agency actions for the ERP and State 404 Program authorizations be issued at the same time. (This is strongly recommended to ensure consistency, and to reduce the potential need for project modifications to resolve inconsistencies that may occur when the agency actions are issued at different times.) If this box is checked and the Agency(ies) determines that no State 404 Program authorization is required, the Agency will continue to abide by section 5.5.3 of Volume I.

C. **List the type of activities proposed. Check all that apply**, **and provide the supplemental information requested in each of the referenced application sections.** Please also reference Applicant's Handbook Volumes I and II for the type of information that may be needed.

☐ Activities associated with one single-family residence, duplex, triplex, or quadruplex that do not qualify for an exemption or a General Permit: **Provide the information requested in Section B. Do not complete Section C.**

☐ Activities within wetlands or surface waters, or within 25 feet of a wetland or surface water, (not including the activities associated with an individual single-family residence). Examples include dredging, filling, outfall structures, docks, piers, over-water structures, shoreline stabilization, mitigation, reclamation, and restoration/enhancement. **Provide the information requested in Section C.**

☐ Activities within navigable or flowing surface waters such as a multi-slip dock or marina, dry storage facility, dredging, bridge, breakwaters, reefs, or other offshore structures: **In addition to Section C, also provide the information requested in Section D.**

☐ Activities that are (or may be) located within, on, or over state-owned submerged lands (See Chapter 18-21, F.A.C. https://www.flrules.org/gateway/ChapterHome.asp?Chapter=18-21): **In addition to Section B or C, also provide the information requested in Section F.**

☒ Construction or alteration of a stormwater management system serving residential, commercial, transportation, industrial, agricultural, or other land uses, or a solid waste facility (excluding mines that are regulated by DEP). **Provide the information requested in Section E.**

☐ Creation or modification of a Mitigation Bank (refer to Chapter 62-342, F.A.C. https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-342): **Provide the information requested in Section G.**

☐ Mines (as defined in Section 2.0 of Applicant's Handbook Volume I) that are regulated by the DEP: **Provide the information requested in Section H.**

☐ Other, describe: Please contact the Agency to determine which additional sections of the application are needed. See Attachment 2 for Agency contacts.

D. Describe in general terms the proposed project, system, works, or other activities. For permit modifications, please briefly describe the changes requested to the permit: **Construction and operation of a stormwater management system to serve a 1.11 acre electrical inductor yard and associated infrastructure improvements.**

E. Project/Activity Street/Road Address or other location (if applicable): **5801 S. Ocean Dr.**
City: **Fort Pierce** County(ies): **St. Lucie** Zip: **34949**

Note: For utility, road, or ditch/canal activities, provide a starting and ending point using street names and nearest house numbers or provide length of project in miles along named streets or highways.

F. Project location map and Section, Township, and Range information (use additional sheets if needed):

Please attach a location map showing the location and boundaries of the proposed activity in relation to major intersections or other landmarks. The map should also contain a north arrow and a graphic scale; show Section(s), Township(s), and Range(s); and must be of sufficient detail to allow a person unfamiliar with the site to find it.
Section(s): **16** Township: **36S** Range: **41E** Land Grant name, if applicable:
Section(s): Township: Range:

G. Latitude (DMS) **27º 20' 41.31"** Longitude (DMS) **-80º 14' 52.73"** (Taken from central location of the activity). Explain source for obtaining latitude and longitude (i.e. U.S.G.S. Quadrangle Map, GPS, online resource): **Google Earth**

H. Tax Parcel Identification Number(s): **3508-111-0002-000-3**

[Number may be obtained from property tax bill or from the county property appraiser's office; if on multiple parcels, provide multiple Tax Parcel Identification Numbers]

I. Directions to Site (from major roads; include distances and landmarks as applicable): **The Facility is generally located approximately 6.5 miles south of intersection of Seaway Drive and A1A/S. Ocean Drive, in Fort Pierce the project site will be located on the west side of A1A/S. Ocean Drive. The facility is more specifically located at the St. Lucie Nuclear Power Plant Site, located at 6501 South Ocean Drive, Jensen Beach, FL 34957.**

J. Project area or phase area: **5.45** acres

K. Name of waterbody(ies) (if known) in which activities will occur or into which the system will discharge:

The following questions (M-O) are not applicable to activities related to an individual single-family residence, including a dock, pier, and/or seawall associated with that residence.

L. Is it part of a larger plan of development or sale? ☐ yes ☒ no

M. Impervious or semi-impervious area excluding wetlands and other surface waters (if applicable):

1.30 acres or square feet

N. Volume of water the system is capable of impounding (if applicable):

Normal Pool: **NA** acre-feet. Depth **NA** ft. – **NA, the proposed system is dry detention.**
Maximum Pool: **0.40** acre-feet. Depth **1.07** ft. **Volume and depth based on water quality detention.**

Part 2: Supplemental Information, and Permit History

A. Is this an application to modify an existing Environmental Resource Permit or to construct or implement part of a multi-phase project, such as a project with a Conceptual Approval permit? ☐ Yes ☒ No (If you answered "yes", please provide permit numbers below*):*

Agency	Date	Permit/Application No.	Project Name

B. Indicate if there have been any **pre-application meeting(s)** with the DEP, WMD, or delegated local government, or other discussions, meetings, or coordination with other stakeholders or agencies about the proposed project, system or activity. If so, please provide the date(s), location(s) of the meeting, and the name(s) of Agency staff that attended the meeting(s):

Agency	Date	Location	Meeting Attendees

C. **Attach a depiction (plan and section views), which clearly shows the works or other activities proposed to be constructed.** Use multiple sheets, if necessary, a scale sufficient to show the location and type of works, and include a north arrow and a key to any symbols used. **Specific information to be included in the plans is based on the activities proposed and is further described in Sections B-H**. However, supplemental information may be required based on the specific circumstances or location of the proposed works or other activies.

D. Processing Fee: **Please submit the application processing fee along with this application form and supplemental information.** Processing fees vary based on the size of the activity, the type of permit applied for, and the reviewing Agency. Please reference Appendix D of Applicant's Handbook Volume I to determine the appropriate fee.

Part 3: Applicant and Associated Parties Information

Instructions: Please complete the following sections. For corporations, list a person who is a registered agent or officer of the corporation who has the legal authority to bind the corporation.

A. Applicant (Entity Must Have Sufficient Real Property Interest)
☐ **This is a Contact Person for Additional Information**

Last Name: **Sole** First Name: **Michael** Middle Initial:
Title: **Vice President, Environmental Services** Company: **Florida Power & Light Company**
Address: **700 Universe Blvd.**
City: **Juno Beach** State: **FL** Zip: **33408**
Home Telephone: Work Telephone: **561-691-7068**
Cell Phone: E-mail Address: **Kennard.Proctorjr@fpl.com**

Correspondence will be sent via email, unless you check here to receive it via US Mail: ☐

B. Land Owner(S) (If Different or in Addition to Applicant)
☐ **Check here if land owner is also a co-applicant**

Last Name: First Name: Middle Initial:
Title: Company:
Address:
City: State: Zip:
Home Telephone: Work Telephone:
Cell Phone: E-mail Address:

Correspondence will be sent via email, unless you check here to receive it via US Mail: ☐

C. Operation and Maintenance Entity(see Applicant's Handbook I, Section 12.3)

Last Name: **Sole** First Name: **Michael** Middle Initial:
Title: **Vice President, Environmental Services** Company: **Florida Power & Light Company**
Address: **700 Universe Blvd.**
City: **Juno Beach** State: **FL** Zip: **33408**
Home Telephone: Work Telephone:
Cell Phone: **561-691-7068** E-mail Address:

Correspondence will be sent via email, unless you check here to receive it via US Mail: ☐

D. Co-Applicant (If Different or In Addition to Applicant and Owner)

Last Name: First Name: Middle Initial:
Title: Company:
Address:
City: State: Zip:
Home Telephone: Work Telephone:
Cell Phone:
E-mail Address:

Correspondence will be sent via email, unless you check here to receive it via US Mail: ☐

E. Registered Professional Consultant
☐**This is a contact person for additional information**

Last Name: **Killian** First Name: **Joshua** Middle Initial: **A**
Title: **Project Manager** Company: **Culpepper & Terpening, Inc.**
Address: **2980 South 25th Street**
City: **Fort Pierce** State: **FL** Zip: **34981**
Home Telephone: Work Telephone: **772-464-3537**
Cell Phone:
E-mail Address: **jkillian@ct-eng.com**

Correspondence will be sent via email, unless you check here to receive it via US Mail: ☐

F. Environmental Consultant
☒**This is a contact person for additional information**

Last Name: **Proctor** First Name: **Ken** Middle Initial:
Title: **Sr. Project Manager** Company: **Florida Power & Light**
Address: **700 Universe Boulevard**
City: Juno Beach State: **FL** Zip: **33408**
Home Telephone: Work Telephone: **561-691-7068**
Cell Phone:
E-mail Address: **Kennard.proctorjr@fpl.com**

Correspondence will be sent via email, unless you check here to receive it via US Mail: ☐

G. Agent Authorized to Secure Permit (If Different from Consultant)

Last Name: **Vitola** First Name: **Natalie** Middle Initial:
Title: **Director, Environmental Services** Company: **Florida Power & Light Company**
Address: **700 Universe Blvd.**
City: **Juno Beach** State: **FL** Zip: **33408**
Home Telephone: Work Telephone: **561-691-7068**
Cell Phone:
E-mail Address: **Kennard.Protorjr@fpl.com**

Correspondence will be sent via email, unless you check here to receive it via US Mail: ☐

If necessary, please add additional pages for other contacts and property owners related to this project.

H. Real Property Interest

a. Permits are only issued to entities having sufficient real property interest as described in Section 4.2.3(d) of Applicant's Handbook Volume I**. Please attach evidence of the applicant's real property interest over the land upon which the activities subject to the application will be conducted, including mitigation areas (if applicable).** Refer to Sections 4.2.3(d)-(e) for sufficient real property interest documentation.

b. For activities that require a recorded notice in accordance with rule 62-330.090(7), F.A.C., please provide either the complete legal description of the property or a copy of the pages of the document recorded in the public records that contains the complete legal description. If the land upon which the proposed activities are to occur is not owned by the applicant, the applicant must also provide copies of any right-of-way, leases, easements, or other legal agreement which authorizes the applicant to perform the activities on those lands.

Part 4: Signatures and Authorization to Access Property

Instructions: For multiple applicants please provide a separate Part 4 for each applicant. For corporations, the application must be signed by a person authorized to bind the corporation. A person who has sufficient real property interest (see Section 4.2.3(d) of Applicant's Handbook Volume I) is required in (B) to authorize access to the property, except when the applicant has the power of eminent domain.

A. By signing this application form, I am applying for the permit and any proprietary authorizations identified above, according to the supporting data and other incidental information filed with this application. I am familiar with the information contained in this application and represent that such information is true, complete and accurate. I understand this is an application and not a permit, and that work prior to approval is a violation. I understand that this application and any permit issued or proprietary authorization issued pursuant thereto does not relieve me of any obligation for obtaining any other required federal, state, water management district, or local permit prior to commencement of construction. I agree to operate and maintain the permitted system unless the permitting agency authorizes transfer of the permit to a different responsible operation and maintenance entity. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S. and 18 U.S.C. Section 1001.

Natalie Vitola
Typed/Printed Name of Applicant or Applicant's Authorized Agent


Signature of Applicant or Applicant's Authorized Agent

06/15/2022
Date

Director, Environmental Services
(Corporate Title if applicable)

B. Certification of Sufficient Real Property Interest And Authorization For Staff To Access The Property:

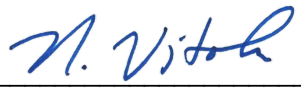
I certify that:

☒ **I possess sufficient real property interest in or control, as defined in Section 4.2.3 (d) of Applicant's Handbook Volume I,** over the land upon which the activities described in this application are proposed and I have legal authority to grant permission to access those lands. I hereby grant permission, evidenced by my signature below, for staff of the Agency to access, inspect, and sample the lands and waters of the property as necessary for the review of the proposed works and other activities specified in this application, upon advance notice. I authorize these agents or personnel to enter the property as many times as may be necessary to make such review, inspection, and/ or sampling. Further, if a permit is granted, upon advance notice, I agree to provide entry to the project site for such agents or personnel with proper identification to determine compliance with permit conditions and permitted plans and specifications.

OR

☐ I represent an entity having **the power of eminent domain and condemnation authority**, and I/we shall make appropriate arrangements to enable staff of the Agency to legally access, inspect, and sample the property as described above.

Natalie Vitola
Typed/Printed Name


Signature

06/15/2022
Date

Director, Environmental Services
(Corporate Title if applicable)

C. Designation of Authorized Agent (If Applicable):

I hereby designate and authorize Natalie Vitola to act on my behalf, or on behalf of my corporation, as the agent in the processing of this application for the permit and/or proprietary authorization indicated above and to furnish, on request, supplemental information in support of the application. In addition, I authorize the above-listed agent to bind me, or my corporation, to perform any requirements which may be necessary to procure the permit or authorization indicated above. I understand that knowingly making any false statement or representation in this application is a violation of Section 373.430, F.S., and 18 U.S.C. Section 1001.



06/15/2022

Michael W. Sole
Typed/Printed Name of Applicant

Signature of Applicant

Date

Vice President, Environmental Services
(Corporate Title if applicable)

Attachment D – Stormwater Report



FPL SANDLOT INDUCTOR YARD

ST. LUCIE COUNTY, FLORIDA

CULPEPPER & TERPENING, INC
CONSULTING ENGINEERS | LAND SURVEYORS

STORMWATER MANAGEMENT PLAN

May 2022
C&T Project No. 21-197
Certificate of Authorization No. 4286

PREPARED BY
Culpepper & Terpening, Inc
2980 South 25th Street
Fort Pierce, Florida
Tel. (772) 464-3537
www.ct-eng.com

PREPARED FOR
Florida Power & Light
a Next Era Energy Company
700 Universe Blvd
Juno Beach, FL 33408
www.fpl.com

This item has been digitally signed and sealed by Joshua A. Killian, PE on Jun. 13, 2022 using a SHA authentication code. Printed copies of this document are not considered signed and sealed and the SHA authentication code must be verified on any electronic copies.

SANDLOT INDUCTOR YARD
Stormwater Management Plan

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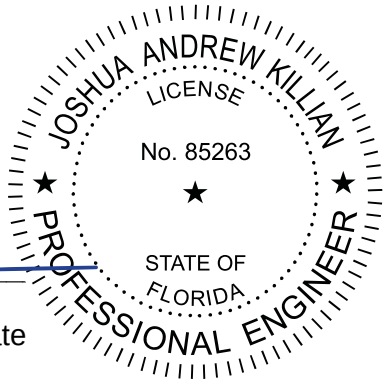
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Submitted by:

Culpepper & Terpening, Inc.



Joshua A. Killian, PE Date
Florida Registration #85263
EOR Responsibility – 100% Pages 1 -64

SANDLOT INDUCTOR YARD
Stormwater Management Plan

SECTION 1 - PROJECT INFORMATION

1.1. General Information

1.1.1. Application Type

This report is provided to support for the Amendment of the St. Lucie Plant Site Certification Application with the Florida Department of Environmental Protection (the "FDEP") for the Florida Power & Light Company Sandlot Inductor Yard Project.

1.1.2. Purpose

Culpepper & Terpening, Inc. has been retained by the Florida Power & Light Company (the "FPL") to prepare a "Stormwater Plan" for the Sandlot Inductor Yard. The Stormwater Plan will meet the criteria of the St. Lucie County (the "County") Land Development Regulations (the "LDR") and the South Florida Water Management District (the "SFWMD)/FDEP ERP Criteria.

The Stormwater Plan will also address other state and federal agencies that may have regulatory permitting requirements that would influence the design criteria. These agencies include but are not limited to the U.S. Army Corps of Engineers (the "USACE") and the U.S. Environmental Protection Agency (the "EPA).

The Stormwater Plan will address historical information and plans, historical drainage patterns and discharge rates, existing permits, the methods of data collection, design assumptions and methodology, land uses, water quality and quantity criteria, and other relevant data.

1.1.3. Project Name

The Project is known as the FPL Sandlot Inductor Yard.

1.1.4. Project Location

The Project is located in Section 16, Township 36S, Range 41E of St. Lucie County.

The facility is generally located at the St. Lucie Nuclear Power Plant Site, located at 6501 South Ocean Drive, Jensen Beach, FL 34957.

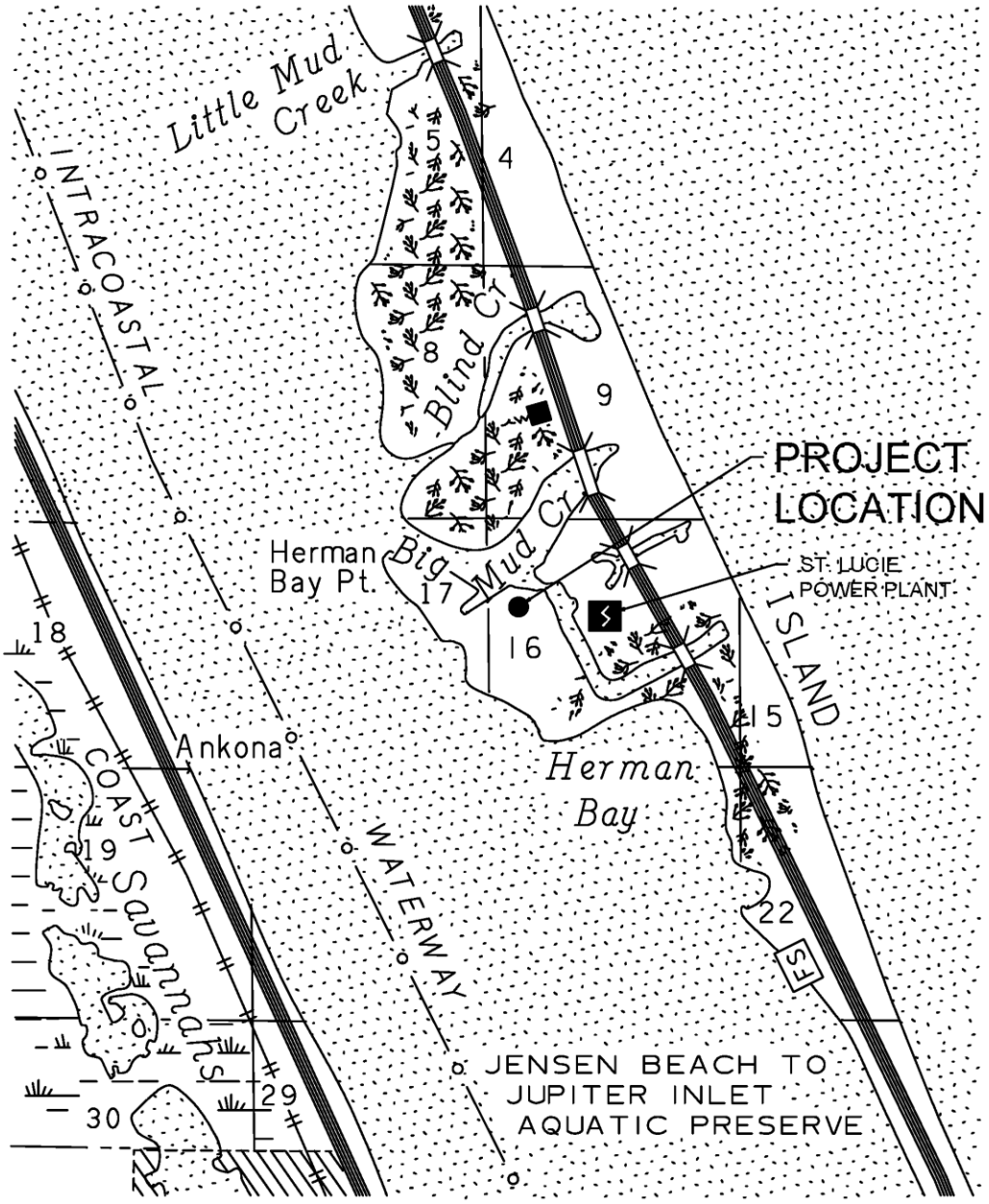
The project development area is bounded to the north by the existing FPL St. Lucie Switchyard, to the east, west and south by site access driveways.

Site access will be provided from South Ocean Drive (A-1-1) via the existing FPL access driveway.

A general location map is shown in Figure 1 "Project Location Map" on page 2.

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Figure 1 – Project Location Map



ST. LUCIE COUNTY
SECTION 16, TOWNSHIP 36 SOUTH, RANGE 41 EAST

CULPEPPER & TERPENING INC
2980 SOUTH 25th STREET • FORT PIERCE, FLORIDA 34981
PHONE 772-464-3537 • FAX 772-464-9497 • www.ct-eng.com
STATE OF FLORIDA BOARD OF PROFESSIONAL ENGINEERS AUTHORIZATION NO. 4286

FPL SANDLOT INDUCTOR YARD	
LOCATION MAP	
JOB NO: 21–197	SCALE: NTS
DRAWN BY: JKILLIAN	DATE: 5/20/2022

1.1.5. Project Team

The Project team consists of:

- **Owner**
  Florida Power & Light Co.
  700 Universe Boulevard
  Juno Beach, FL 33408
  (561)904-5759
  Scott Mosolf
  Scott.Mosolf@fpl.com

- **Engineer**
  Culpepper & Terpening, Inc.
  2980 South 25th Street
  Fort Pierce, FL 34981
  (772)464-3537
  Joshua A. Killian, P.E.
  jkillian@ct-eng.com

- **Surveyor**
  Culpepper & Terpening, Inc.
  2980 South 25th Street
  Fort Pierce, FL 34981
  (772)464-3537
  Thomas P. Kiernan, P.L.S.
  tkiernan@ct-eng.com

- **Environmental Consultant**
  Tetra Tech
  759 South Federal Highway, Suite 314
  Stuart, FL 34994
  (386)679-2371
  Monica Sovacool
  Monica.Sovacool@tetratech.com

- **Geotechnical Consultant**
  Ardaman & Associates, Inc.
  460 NW Concourse Place, Unit 1
  Port St. Lucie, FL 34986
  (772)878-0072

SECTION 2 – PROJECT SITE INFORMATION

2.1 Project History

A review of historic aerials and permits shows the site development area has been historically utilized as a recreational baseball field for the St. Lucie Power Plant workers. The site currently consists primarily of previously disturbed, grass field, with remnant structures and foundations from the previous use as a ball field.

2.2 Existing Drainage Conditions

A review of existing permits as well as field surveys completed by Culpepper & Terpening have revealed that the project area generally drains via sheet flow to the southeast.

There are existing roadside swales that run along the existing driveways on the east and south side of the site, which convey runoff to the southeast and into an existing 18" corrugated metal pipe ("cmp") culvert.

The existing 18" culvert then directs the runoff under the existing driveway and to the south into undeveloped lands.

The undeveloped lands to the south then drain via sheet flow to the south and have an ultimate outfall to the Indian River Lagoon.

The land ranges from a high of approximately 9.5 ft, NAVD to a low of approximately 3.5 ft, NAVD.

The existing drainage conditions are depicted in Pre-Development Basin Map identified as Figure 3 on page 6.

2.3 Conservation Easement

There are no existing conservation easements within the project area.

2.4 Wetland and Other Surface Water Impacts

There are no wetland located within or adjacent to the proposed development area. Therefore no wetland or other surface water impacts proposed with the site development.

2.5 Flood Zone

The FEMA Flood Insurance Rate Map (the "FIRM") depicts that the project area is located completely within FEMA Flood Zone X, based on FEMA FIRM No. 12111C0301K dated February 19, 2020, St. Lucie County, Florida.

FEMA defines Zone X as an area of minimal flood hazard above the 500 Year flood level.

An excerpt of the FEMA FIRM for the project area is included as Figure 2 on page 5.

Figure 2 – FEMA Flood Map

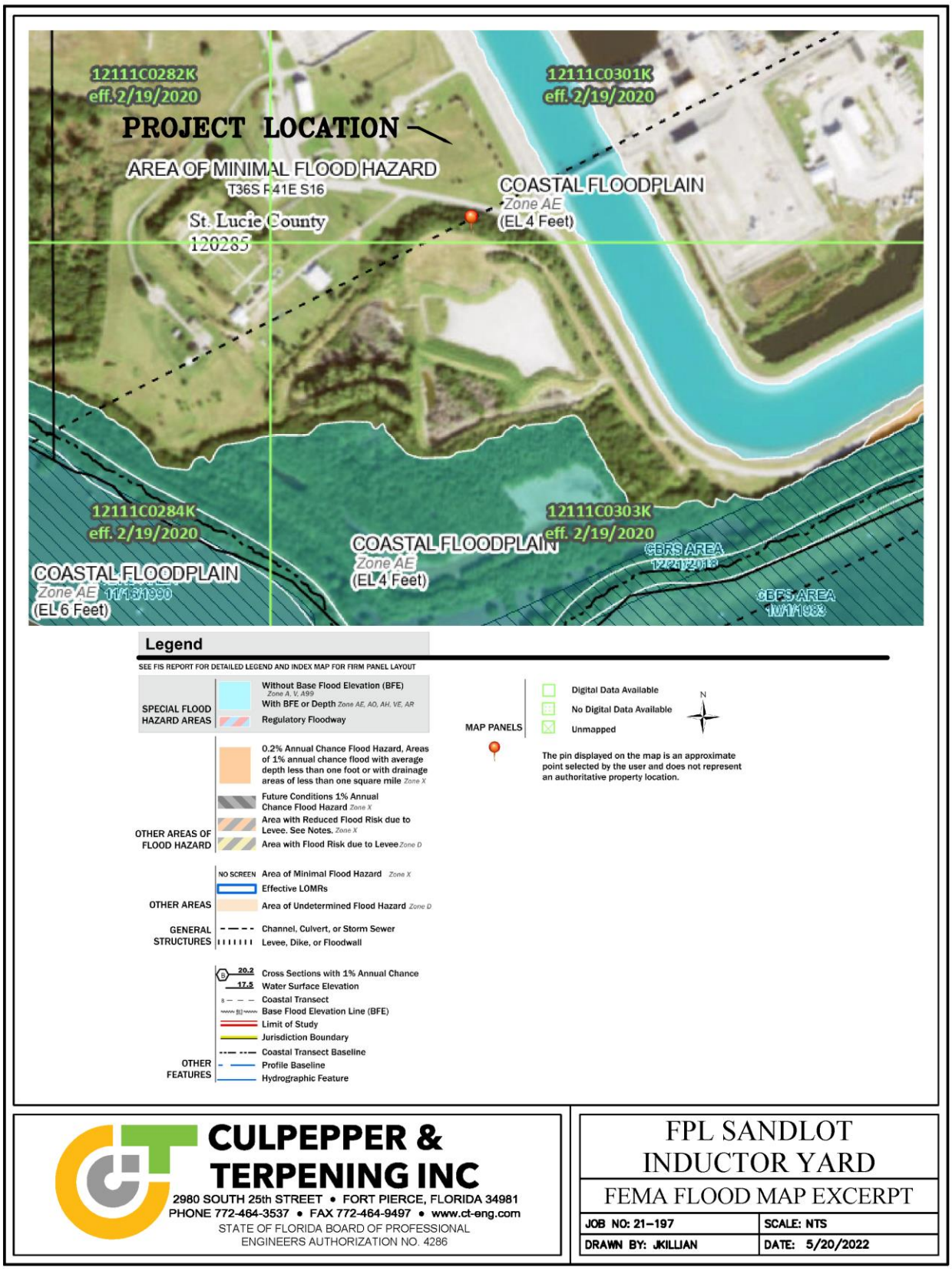


Figure 3 – Pre-Development Basin Map

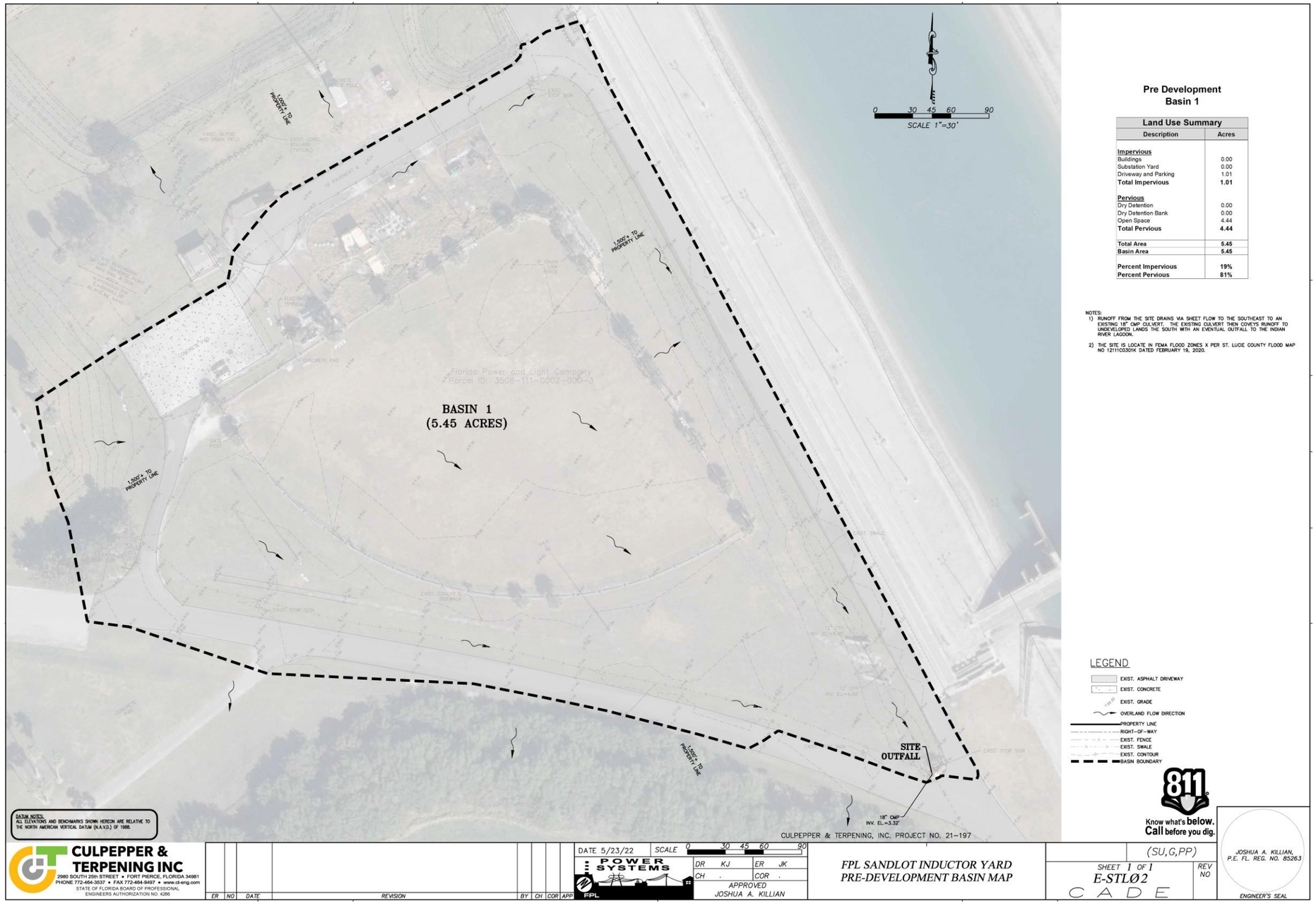
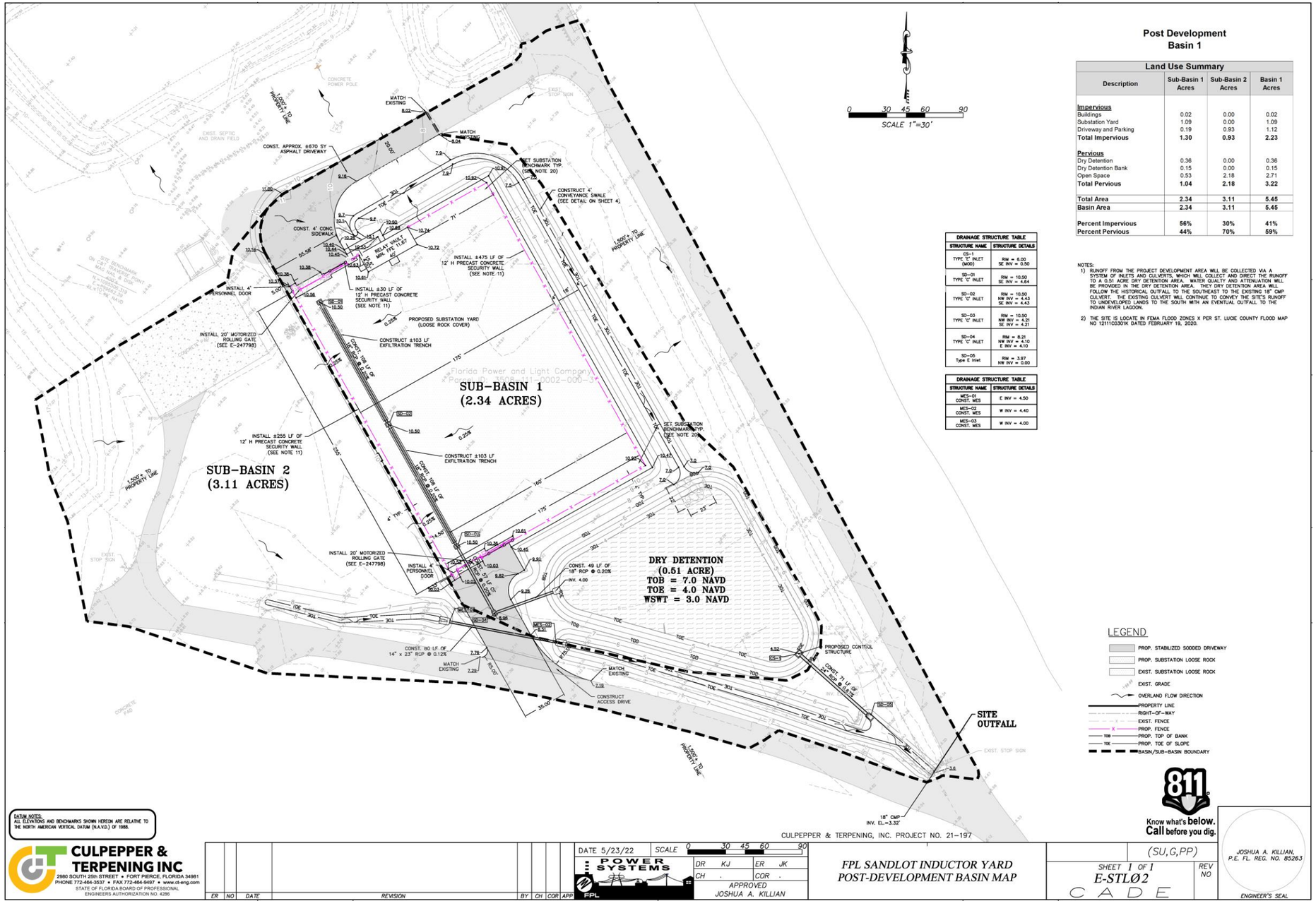


Figure 4 – Post-Development Basin Map



SECTION 3 - PROPOSED PROJECT

3.1. Project Description

The proposed project consists of the construction of a stormwater management system to serve the proposed electrical inductor yard and supporting infrastructure.

The proposed project is located within a single 5.45 acre drainage basin, of which 2.34 acres will be developed as the inductor yard facility, access driveways, upland open space and the associated stormwater management system. The remaining 3.11 acres will remain as existing upland open space and access driveways.

The 5.45 acre basin is located within the overall St. Lucie Power Plant site, which has a total parcel area of approximately 595 acres.

A copy of the Pre and Post-Development Land Use Summaries are included in Appendix 1 "Stormwater Calculations," on page 28 and 30, respectively.

3.2. Permitting Description

FPL is requesting the approval for the construction and operation of the project site infrastructure and stormwater management system to serve the proposed inductor yard and associated site improvements.

3.3. Proposed Phasing

The Project will be developed in one phase of construction and is anticipated to commence immediately after issuance of all permits and approvals.

3.4. Basin Description

The site consists of one 5.45 acre Basin, Basin 1, which and has a single outfall to the southeast, with an eventual outfall to the Indian River Lagoon.

Basin 1 currently drains via sheet flow to the southeast. There are existing roadside swales that run along the existing driveways on the east and south side of the site, which convey runoff to the southeast and into an existing 18" corrugated metal pipe ("cmp") culvert.

The existing 18" culvert then directs the runoff under the existing driveway and to the south into undeveloped lands.

The undeveloped lands to the south then drain via sheet flow to the south and have an ultimate outfall to the Indian River Lagoon

For the purpose of analysis Basin 1 has been subdivided into two (2) sub-basin.

The all of the site improvements, including the inductor yard, driveways and dry detention pond will be constructed within Sub-basin 1.

Sub-basin 1 is 2.34 acres and will drain via sheet flow to a system of inlets and culverts which will convey runoff to a single, 0.51 acre dry detention pond.

The dry detention pond will then have a controlled outfall, via Control Structure CS-1, to the southeast. The discharge will then be conveyed to the south via the existing 18" cmp culvert.

The proposed single 0.51 acre dry detention pond will provide water quality and attenuation for the site improvements proposed in Sub-basin 1.

Sub-basin 2 is 3.11 acres and will consist of undeveloped open space and existing access driveways.

Sub-basin 2 will continue to drain via two (2) roadside swales to the existing, historical outfall the southeast via the existing 18" cmp culvert. Minor swale improvements are proposed to preserve the flow of the swales across the south proposed inductor yard driveway.

Since Sub-basin 2 has no added impervious and no changes to the existing outfall condition, reasonable assurance is provided that there will be no impacts to water quality, water quantity or flood protection.

Therefore, the remainder of the analysis and this report will focus on the proposed improvements in Sub-basin 1.

Sub-basins 1 and 2 are graphically depicted in Figure 4 "Post-Development Basin Map," on page 7.

3.5. Proposed Outfall

The proposed stormwater management system for Sub-basin 1 consists of a single, 0.51 acre dry detention pond, which will have a controlled outfall connection via control structure CS-1, to the existing, historical 18" cmp outfall culvert. The site has an ultimate outfall to the south and into the Indian River Lagoon.

3.6. Drainage System Overview

3.6.1. Stormwater Management Areas

The stormwater management system consists of single dry detention pond with a total acreage of 0.51 acres, measured from the top of bank. The dry detention pond has a proposed bottom elevation of 4.0 ft, NAVD and a top of bank elevation at 7.0 ft, NAVD.

The dry detention pond's control elevation is set at the pond bottom elevation of 4.0 ft, NAVD, which is one foot above the estimated wet season water table elevation (the "WSWT") of 3.0 ft, NAVD.

3.6.2. Maintenance Responsibilities

FPL, a single entity owner, will own and maintain the onsite stormwater management system including the onsite conveyance system.

3.7. Land Use

Please refer to Table No. 1 "Land Use Summary" below, which depicts the proposed land uses for Sub-basin 1 and Sub-basin 2.

Table No. 1

Post Land Use Summary

Land Use	Sub-basin 1 (Acres)	Sub-basin 2 (Acres)	Basin 1 Total (Acres)
Impervious			
Buildings	0.02	0.00	0.02
Substation Yard	1.09	0.00	1.09
Driveway and Parking	0.19	0.93	1.12
Total Impervious	**1.30**	**0.93**	**2.23**
Pervious			
Dry Detention	0.36	0.00	0.36
Dry Detention Bank	0.15	0.00	0.15
Open Space	0.53	2.18	2.71
Total Pervious	**1.04**	**2.18**	**3.22**
Total Area	**2.34**	**3.11**	**5.45**
Basin Area	**2.34**	**3.11**	**5.45**
Percent Impervious	**56%**	**30%**	**41%**
Percent Pervious	**44%**	**70%**	**59%**

3.8. Related Information

3.8.1. Water Use

Construction dewatering is not anticipated for the project.

3.8.2. Potable Water Supplier

There is no proposed potable water for the project as the facility is unmanned.

3.8.3. Wastewater Supplier

There are no proposed wastewater facilities for the project as the facility is unmanned.

3.8.4. Irrigation Water Supplier

There is no irrigation proposed for the project.

3.8.5. Wellfield Protection Zone

As per St. Lucie County Wellfield Project Map, FLU-11, no portions of the project are in a Wellfield Protection Zone of St. Lucie County.

3.8.6. SFWMD Right-of-Way

No work is proposed within a SFWMD Right-of-Way.

3.8.7. St. Lucie County Right-of-Way

No work is proposed within a St. Lucie County Right-of-Way

3.8.8. NPDES Compliance

The project will meet or exceed National Pollutant Discharge Elimination System permit requirements and a Notice of Intent will be applied for with the Florida Department of Environmental Protection. A Stormwater Pollution Prevention Plan has been prepared and is included in the construction plans.

SECTION 4 - STORMWATER DESIGN CRITERIA

4.1. Stormwater Modeling

The ICPR4 stormwater modeling software was utilized to analyze the following design events. Table No 2. “Design Storms” below, depicts the project’s design criteria.

The following rainfall amounts for each of the design storm events were derived from the SFWMD Applicants Handbook Vol. II Isohyetal Rainfall Maps.

Table No. 2

Design Storm Events

Protection	Event - Year	Duration	Rainfall – inches
Driveway Pavement	10	1 Day	6.18”
Perimeter Berm/Discharge	25	3 Day	10.00”
Finished Floor	100	3 Day	12.10”

4.2. Flood Protection Criteria

4.2.1. Finished Floor Elevations

In accordance with the SFWMD Applicants Hand Book Vol. II (the “AHB Vo. II”) Section 3.4, the minimum finished floor elevation shall be designed to be at or above the 100 Year, 3 Day – Zero Discharge flood elevation.

4.2.2. Minimum Roadway Elevations

This criteria is not applicable to the project as there are no proposed roadways associated with the development.

4.2.3. Minimum Driveway Pavement Elevations

In accordance with the SFWMD AHB Vol. II Section 3.5, the minimum driveway pavement elevation shall be based on the 10 Year, 1 Day Storm Event.

4.2.4. Perimeter Berm Elevations

The design minimum perimeter elevation shall be based on the 25 Year, 3 Day Storm Event, which has been routed through a stormwater management system per SFWMD design criteria and St. Lucie County Land Development Regulations.

4.3. Water Quality Criteria

In accordance with the SFWMD AHB Vol. II, Section 4.2.1, the water quality criteria are as follows:

- Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage impervious, whichever is greater;
- Retention volume shall be provided equal to 50 percent of the above amounts for wet detention; and
- Projects which discharge to an impaired waters or to Outstanding Florida Waters, must provide an additional 50 percent of the required treatment.

4.4. Water Quantity Criteria

4.4.1. Discharge Rate

In accordance with SFWMD AHB Vol. II, Section 3.2, offsite discharge contributed by a development is limited to amounts which will not cause adverse impacts. These amounts may be determined by:

- Historic Discharge Rates;
- Rates determined in previous SFWMD permit actions;
- Rates Specified in SFWMD Criteria in AHB Vol. II Appendix A;
- Rates based on system capacity for selected County primary outfall canals, unless special engineering studies are provided by a Registered Professional Engineer; and
- A 25 Year, 3 Day Storm Event shall be used for computing offsite discharge.

4.4.2. Bleeder Sizing

In accordance with SFWMD AHB Vol. II, Section 5.2, a gravity control devised shall be sized based on a maximum design discharge of one half inch of the detention volume in 24 hours.

4.4.3. Recovery

The SFWMD AHB Vol. II, Section 3.9 requires recovery to the design control elevation within 12 days from the cessation of the 25 Year, 3 Day Storm Event.

4.5. Floodplain Criteria

The FEMA Flood Insurance Rate Map (the "FIRM") depicts that the project area is located completely within FEMA Flood Zone X, based on FEMA FIRM No. 12111C0301K dated February 19, 2020, St. Lucie County, Florida.

FEMA defines Zone X as an area of minimal flood hazard above the 500 Year flood level.

An excerpt of the FEMA FIRM for the project area is included as Figure 2 on page 2.

Since the project is completely within FEMA Flood Zone X, there are no flood plain impacts anticipated with the proposed project.

SECTION 5 – STORMWATER ANALYSIS

5.1. Control Elevation

The control elevation for the proposed dry detention pond bottom elevation of 4.0 ft, NAVD.

5.2. Wet Season Water Table Elevation

An estimated wet season water table elevation of 3.0 ft, NAVD was utilized for the site as per data provided in the Geotechnical Analysis completed by Ardaman & Associates, Inc. dated October 3, 2013.

A copy of the Geotechnical Analysis is included as Appendix 4 on page 65.

5.3. Control Structure

The Sub-basin 1 dry detention pond has one (1) outfall control structure, CS-1.

CS-1 has been designed as a modified Type E inlet with a rim elevation set at 6.0 ft, NAVD, which is 0.30 feet above the 25 Year, 3 Day storm event peak stage.

CS-1 was a sharp crested, vertical, rectangular weir and a circular bleeder orifice on the north face of the structure.

The rectangular weir is 6"(W) x 7.56" (H) with an invert elevation of 5.07 ft, NAVD, the water quality stage.

The circular bleeder orifice has a 3" diameter and an invert elevation of 4.00 ft, NAVD, the dry detention pond bottom elevation.

5.4. Tailwater

A constant tailwater has been utilized for both the 10 Year, 1 Day and 25 Year, 3 Day Storm events. The tailwater has conservatively set at 4.0 ft, NAVD, which is 1 foot above the estimated wet season water table elevation for the site.

5.5. Offsite Flows

A review of surrounding permits, surveys and field observed conditions has been conducted to determine if there are any contributing offsite flows which will impact the design of the system.

Based on the site topography and the existing surrounded permitting system offsite flows have been determined to be precluded from entering the site.

The project development area's boundary conditions are depicted on the Post-Development Basin Map, which is included as Figure 4 on page 7.

5.6. Curve Number "CN" and Time of Concentration "TOC"

A review of the NRCS/USDA St. Lucie County Soil Survey revealed that the site consists of primarily of Arents (Hydrologic Soils Group A).

The TR-55 Table 2.2a "Open Space – good condition" was used to establish the pre-development weighted curve number of 39 for the pervious areas of Basin 1.

A curve number of 98 was used for the pre-development impervious areas of Basin 1.

The TR-55 Table 2.2a "Open Space – Good Condition" was used to establish a post-development pervious weighted curve number of 39 for both Sub-basin 1 and Sub-basin 2.

A curve number of 98 was used for the post-development impervious areas for both Sub-basins.

The final composited weighted curve number of 72 was used for Sub-basin 1 post-development analysis and a final composite weighted curve number of 57 was used for Sub-basin 2 post-development analysis.

The following are resultant weighted curve numbers for the pre and post-development conditions:

- Basin 1 Pre-Development CN = 50
- Sub-basin 1 Post-Development CN = 72
- Sub-basin 2 Post-Development CN = 57

A copy of the Curve Number Analysis is included in Appendix 1 "Stormwater Calculations," starting on page 26.

Time of concentration was calculated for the pre and post-development conditions in accordance with the TR-55 Time of Concentration and Travel Time methodology:

- Basin 1
    - Pre-Development Tc = 59 minutes
- Sub-basin 1
    - Post-Development Tc = 52 minutes
- Sub-basin 2
    - Post-Development Tc = 52 minutes

A copy of the post-development time of concentration analysis is included in Appendix 1 “Stormwater Calculations,” on page 25.

5.7. Water Quality

The project was analyzed for Water Quality per SFWMD AHB Vol. II Section 3.2, for a dry Detention System. The controlling criteria for the Sub-basin 1 was the treatment for 2.5” over the impervious areas.

The required water quality volume for Sub-basin 1 was increased by 50% for discharge into an impaired water body.

- Required Water Quality Volume = 0.40 ac-ft.

Please refer to Appendix 1, “Stormwater Calculations” on page 31, for the Water Quality Analysis.

5.8. Stage Storage Computations

The Sub-basin 1 in the post-development condition has two (2) distinct areas available for stormwater runoff storage, which are the dry detention pond and the open space areas.

The dry detention pond has a total acreage of 0.51 acres measured at the top of bank. The dry detention pond has a bottom elevation of 4.0 ft, NAVD and top of bank elevation of 7.0 ft, NAVD.

The open space comprises all areas that are not a part of the buildable area or the water management areas. The total open space acreage is 0.53 acres and ranges from 7.0 ft, NAVD to 8.5 ft, NAVD.

Stage storage relationships was developed for the pre-development Basin 1 and post-development Sub-basin 1. Please refer to the Post-Development Stage Storage Analysis as included in Appendix 1 “Stormwater Calculations,” on page 29 for the pre-development Basin 1 Stage Storage and on page 33on page 33 for the post-development Sub-basin 1 Stage Storage.

5.9. Water Quantity

5.9.1. Allowable Discharge

The ICPR 4 Hydrology and Hydraulic modeling software was utilized to analyze the pre and post-development peak discharge for the 25 Year, 3 Day Storm Event.

The pre-development Basin 1 discharge rate for the 25 Year, 3 Day Storm Event was modeled at 5.89 cfs for the entire 5.45 acre Basin 1. Therefore the total allowable discharge rate for the site is 5.89 cfs or 1.1 cfs/acre.

- Allowable Peak Discharge Rate = 5.89 cfs (1.1 cfs/acre)

The outfall control structure, CS-1, weir and bleeder have been sized to provide a post-development discharge rate equal to a ratable share of the pre-development discharge rate for Basin 1.

To analyze the post-development peak discharge rate, an aggregate peak discharge rate was considered for the two (2) sub-basins, as well as an individual peak rate of discharge for Sub-basin 1 based on the ratable share of the allowable discharge rate on a cfs/acre basis.

A copy of the pre-development peak rate of discharge analysis is included as Appendix 2 on page 37.

A copy of the post-development peak rate of discharge analysis is included in Appendix 2 on page 43.

5.9.2. Bleeder Sizing Analysis

A minimum 3” circular bleeder is proposed for control structure CS-1. As per SFWMD AHB Vol. II, Section 5.2 a minimum sized bleeder is assumed to meet the allowable bleeder discharge criteria.

5.9.3. Recovery Analysis

ICPR 4 was utilized to analyze the site’s stormwater management system recovery time for the 25 Year, 3 Day Storm Event to the systems control elevation.

A copy of the Recovery Analysis is included in Appendix 2 “ICPR Modeling Results,” on page 47.

5.10. ICPR Routings

The ICPR 4 Modeling was performed for the post-development condition and included the following storm events.

- 10 Year, 1 Day;
  - Minimum Pavement Elevation (Driveways)
- 25 Year, 3 Day;
  - Allowable Discharge Rate
  - Minimum Perimeter Berm Elevation
- 100 Year, 3 Day – Zero Discharge;
  - Finished Floor Elevation

The ICPR Analysis and Results are included in Appendix 2 "ICPR Modeling Results," on page 36 for the pre-development analysis and on page 41 for the post-development analysis.

SECTION 6 - SUMMARY OF RESULTS

6.1. Basin Analysis Summary

ICPR routings are provided for the site for the 10 Year, - Day, 25 Year, 3 Day, and 100 Year, 3 Day – Zero Discharge Storm Events. This information is summarized in Table 3 below and the ICPR node maximum result are included Appendix 2 starting on page 42.

Table No. 3		
Development Basin (Sub-Basin 1)		
Protection	**Routed (NAVD)**	**Plan (NAVD)**
10 Year, 1 Day (Min. Pavement - Driveway)	5.06	7.24
25 Year, 3 Day (Recovery and Basin Flood Protection)	5.70	7.0
100 Year, 3 Day – Zero Discharge (Min. FFE)	7.48	11.67

6.2. Minimum Pavement Elevation

The minimum plan driveway pavement elevation of 7.24 ft, NAVD is above the peak routed stage of 5.06 ft, NAVD for the 10 Year, 1 Day Storm Event for Sub-basin 1.

Therefore, there is reasonable assurance that pavement flood protection is provided with the proposed design per County and SFWMD/FDEP criteria.

The 10 Year, 1 Day Storm Event Node Max. Report is included in Appendix 2 on page 42.

6.3. Perimeter Berm Elevation

The minimum plan perimeter berm elevation of 7.0 ft, NAVD is above the peak routed stage of 5.70 ft, NAVD for the 25 Year, 3 Day Storm Event for Sub-basin 1. The top of bank of the dry detention pond 7.0 ft, NAVD and has been designed to provide a more than one foot of freeboard relative to the peak stage of the 25 Year, 3 Day Storm Event.

Therefore, there is reasonable assurance that basin flood protection is provided with the proposed design per County and SFWMD/FDEP criteria.

The 25 Year, 3 Day Storm Event Node Max. Report is included on page 43 of Appendix 2 "ICPR Modeling Results."

6.4. Minimum Finished Floor Elevation

The proposed facility is an unmanned inductor yard and there are no proposed habitable structures for the project.

To ensure flood protection of the unmanned relay vaults within the inductor yard, the 100 Year, 3 Day – Zero Discharge Storm Event was analyzed.

The minimum proposed Finished Floor Elevation for the unmanned relay vault of 11.67 ft, NAVD is above the peak routed stage of 7.48 ft, NAVD for the 100 Year, 3 Day – Zero Discharge Storm Event for Sub-Basin 1.

Therefore, there is reasonable assurance that building flood protection is provided with the proposed design per County and SFWMD/FDEP criteria.

The 100 Year, 3 Day – zero discharge Storm Event Node Max. Report is included in Appendix 2 on page 44.

6.5. Water Quality

The Required Water Quality Volume for Sub-basin 1 is 0.40 ac-ft, which includes an additional 50% of treatment volume for discharge to an impaired basin.

The required water quality volume will be provided in the dry detention pond. The water quality volume will be provided between the elevations of 4.0 ft, NAVD (dry detention bottom elevation) and 5.07 ft, NAVD (CS-1 weir invert elevation).

- Required Water Quality Volume = 0.40 ac-ft; and
- Provided Water Quality Volume = 0.40 ac-ft

Since the required water quality volume is provided in the proposed dry detention system, there is reasonable assurance that water quality protection is provided with the proposed design per County and SFWMD/FDEP criteria.

The Water Quality Analysis is included in Appendix 1, "Stormwater Calculations" on page 31.

There is no proposed Development for Sub-basin 2 and therefore the water quality criteria is not applicable for Sub-basin 2.

6.6. Water Quantity

6.6.1. Peak Discharge

The outfall control structure, CS-1, weir and bleeder have been sized to provide a post-development discharge less than the allowable pre-development discharge for Basin 1.

The pre-development Basin 1 discharge rate for the 25 Year, 3 Day Storm Event was modeled at 5.89 cfs for the entire 5.45 acre Basin 1. Therefore the total allowable discharge rate for the site is 5.89 cfs or 1.1 cfs/acre.

- Allowable Peak Discharge Rate = 5.89 cfs (1.1 cfs/acre)

To analyze the post-development peak discharge rate for the two (2) sub-basins both an aggregate peak discharge rate was considered for the two (2) sub-basins, as well as an individual peak rate of discharge for Sub-basin 1 based on the ratable share of the allowable discharge rate on a cfs/acre basis.

The combined, aggregate post-development peak rate of discharge for Sub-basin 1 and Sub-basin 2 was 4.72 cfs. In addition the individual peak rate of discharge for just 2.34 acre Sub-basin 1 was 1.11 cfs or 0.47 cfs/acre.

Since the peak aggregate discharge for Sub-basins 1 and Sub-basin 2 as well as the individual peak rate of discharge for Sub-basin 1 were both less than the Basin 1 pre-development peak rate of discharge, reasonable assurance in provided the proposed improvements meet the water quantity criteria.

- Allowable = 5.89 cfs
- Provided = 4.72 cfs

A copy of the 25 year, 3 day storm event are included in Appendix 2, “ICPR Modeling Results” on page 43.

6.6.2. System Recovery

The 25 Year, 3 Day Storm Event Recovery Analysis shows that Sub-basin 1 recovers to dry detention pond bottom elevation of 4.0 ft, NAVD within the required 12 days.

A copy of the Runoff Volume Recovery Analysis is included in Appendix 2 on page 47.

Since the system recovers to the dry detention control elevation of 4.0 ft, NAVD, reasonable assurance is provided the system meets the flood protection recovery criteria.

A copy of the Recovery Analysis is included in Appendix 2 “ICPR,” on page 47.

6.7. NPDES Compliance

The project will exceed National Pollution Discharge Elimination System permit requirements.

Silt screens, erosion control BMP's or other such sediment control measures will be used during any construction as needed. All disturbed areas shall be stabilized and vegetated immediately after construction to prevent erosion or sediment transport offsite.

A Stormwater Pollution Prevention Plan (the "SWPPP") is included in the construction plans.

SECTION 7 - CONCLUSIONS

Based on the stormwater analysis preformed for the proposed Kent Substation, the firm of Culpepper & Terpening, Inc. has concluded that:

- All requirements of St. Lucie County, FDEP, SFWMD and FEMA addressing stormwater attenuation, water quantity, water quality and floodplain regulations have been addressed and satisfied with the report;
- All development will occur within the Sub-basin 1;
- There is no proposed development within the Sub-basin 2;
- There are no proposed wetland or other surface water impacts with the project;
- The Sub-basin 1 surface water management system consists of a single dry detention pond with a total area of 0.51 acres at the top of bank;
- The WSWT elevation for the site is estimated at 3.0 ft, NAVD;
- The bottom of the dry detention pond has been set at 4.0 ft, NAVD, one foot above the WSWT elevation of 3.0 ft, NAVD;
- The Sub-basin 1 system is a detention system designed to provide attenuation of the 25 Year, 3 Day Storm Event;
- Sub-basin 1 dry retention pond will provide water quality treatment and attenuation;
- There is no water quality criteria for Sub-basin 2 as there is no proposed work within Sub-basin 2;
- In accordance with County and FDEP/SFWMD criteria the Sub-basin 1 surface water management system will provide 0.40 ac-ft of water quality treatment volume, which includes an additional 50% of treatment volume for discharge into an impaired waterbody;
    - Required Water Quality Volume = 0.40 ac-ft
    - Provided Water Quality Volume = 0.40 ac-ft
- The Sub-basin 1 minimum pavement (driveway) elevation is calculated to be 5.06 ft, NAVD, and set at 7.24, ft NAVD;

- The Sub-basin 1 minimum berm elevation is calculated to be 5.70, NAVD, and set at 7.0 ft, NAVD;
- The Sub-basin 1 stormwater management system has been designed to provide more than 1 foot of freeboard between the peak stage of the 25 Year, 3 Day Storm Event and the dry detention pond top of bank;
- The Sub-basin 1 minimum Finished Floor Elevation is calculated to be 7.48 ft, NAVD, and unmanned substation relay vault's finished floor elevation is set at 11.67 ft, NAVD;
- The entire development area is located within FEMA Flood Zone X, therefore no flood plain impacts are proposed;
- The site has been designed to recover from the entire runoff volume from the 25 Year, 3 Day Storm Event, within 12 days from the cessation of the storm;
- All local, State and Federal flood protection requirements have been satisfied;
- Best Management Practices have been utilized in preparing a SWPPP to comply with NPDES;
- The Florida Power & Light Company will own and maintain the onsite stormwater management system, including the conveyance system;
- No water or wastewater services are proposed as the site is an unmanned facility;
- Offsite flows have been considered and determined to be precluded from entering the site; and
- Based on the analysis conducted by Culpepper and Terpening, Inc., the construction and operation of the proposed FPL Sandlot Inductor Yard will not adversely impact waters of the state, nor upstream nor downstream conditions.

Appendix 1 – Stormwater Calculations

Sandlot Inducter Yard

Results Summary

Rainfall Amounts

10 Year 1 Day Storm	6.18 in.
25 year 3 Day Storm	10.00 in.
100 Year 3 Day Storm	12.10 in.

Basin 1 Results				
Criteria	**Routed Elevation**		**Plan Elevation**	
Wet Season Water Table	3.00	NAVD	3.00	NAVD
Control Elevation	4.00	NAVD	4.00	NAVD
Minimum Pavement (10 Year 1 day)	5.06	NAVD	7.24	NAVD
Minimum Perimeter (25 Year 3 day)	5.70	NAVD	7.0	NAVD
Minimum FFE (100 Year 3 Day)	7.48	NAVD	11.67	NAVD

Sandlot Inducter Yard
PRE-DEVELOPMENT TIME OF CONCENTRATION (Tc)

BASIN	SHEET FLOW					SHALLOW CONCENTRATED FLOW					CHANNEL FLOW									Tc	
ID #	Manning n (--)	Flow Length L (ft)	2-Year 24-Hour Rain, P2 (in)	Land Slope s (--)	Tt_1 (hr)	Paved or Unpaved (P or U)	Flow Length L (ft)	Water-course Slope, s (--)	Avg Velocity V (ft/s)	Tt_2 (hr)	Culvert Diam D (ft)	Cross Section Area, a (ft^2)	Wetted Perim. Pw (ft)	Hydraulic Radius r (ft)	Channel Slope s (--)	Manning n (--)	Avg Velocity V (ft/s)	Flow Length L (ft)	Tt_3 (hr)	Ic (hr)	Ic (min)
Basin 1	0.15	300	5.25	0.002	**0.84**	U	315	0.002	0.65	**0.14**		0	0	0.000	0.000	0	0	0	**0.00**	**0.98**	**59**

Sheet Flow, $Tt_1 = (0.007(n*L)^{0.8})/(P_2^{0.5}*s^{0.4})$

Where

Tt = travel time (hr)
n = manning's coefficient (TR 55)
L = flow length (ft)
P_2 = 2-year, 24 hour rainfall (in)
s = land slope (ft/ft)

Shallow Concentrated Flow, $Tt_2 = L/(3600*V)$

Where

Tt = travel time (hr)
L = flow length (ft)
V = velocity (ft/s)

Channel Flow, $Tt_3 = L/(3600*V)$

Where

Pw = wetted perimeter (ft)
r = hyraulic radius (ft) = a/Pw
a = cross sectional area of flow (ft^2)
n = manning's coefficient (TR 55)
Tt = travel time (hr)
s = land slope (ft/ft)
L = flow length (ft)
V = velocity (ft/s)

Sandlot Inducter Yard
POST-DEVELOPMENT TIME OF CONCENTRATION (Tc)

BASIN	SHEET FLOW					SHALLOW CONCENTRATED FLOW					CHANNEL FLOW									Tc	
ID #	Manning n (--)	Flow Length L (ft)	2-Year 24-Hour Rain, P2 (in)	Land Slope s (--)	Tt_1 (hr)	Paved or Unpaved (P or U)	Flow Length L (ft)	Water-course Slope, s (--)	Avg Velocity V (ft/s)	Tt_2 (hr)	Culvert Diam D (ft)	Cross Section Area, a (ft^2)	Wetted Perim. Pw (ft)	Hydraulic Radius r (ft)	Channel Slope s (--)	Manning n (--)	Avg Velocity V (ft/s)	Flow Length L (ft)	Tt_3 (hr)	Tc (hr)	Tc (min)
Basin 1	0.15	300	5.25	0.002	**0.84**	U	60	0.002	0.65	**0.03**	0	0	0	0.000	0.000	0	0	0	**0.00**	**0.87**	**52**

Sheet Flow, $Tt_1 = (0.007(n*L)^{0.8})/(P_2^{0.5}*s^{0.4})$

Where

Tt = travel time (hr)
n = manning's coefficient (TR 55)
L = flow length (ft)
P_2 = 2-year, 24 hour rainfall (in)
s = land slope (ft/ft)

Shallow Concentrated Flow, $Tt_2 = L/(3600*V)$

Where

Tt = travel time (hr)
L = flow length (ft)
V = velocity (ft/s)

Channel Flow, $Tt_3 = L/(3600*V)$

Where

Pw = wetted perimeter (ft)
r = hyraulic radius (ft) = a/Pw
a = cross sectional area of flow (ft^2)
n = manning's coefficient (TR 55)
Tt = travel time (hr)
s = land slope (ft/ft)
L = flow length (ft)
V = velocity (ft/s)

Sandlot Inducter Yard
Basin 1

SCS Curve Number, Soil Storage, & Tc Derivation:

1) Natural Condition:

a) Drainage Area = 5.45 acre
b) Impervious Area = 1.01 acre
c) % Impervious = 19% 98 CN
d) % Pervious = 81% acre 39 CN
e) Soil Type:

	Percentage	Num.	Name	Soil Group	Curve Number
1)	100%	5	Arents	A	39
2)					

Soil Group from USDA St. Lucie County Soil Survey
Curve numbers from TR 55 Table 2-2a Open Space - good condition (grass cover > 75%)

f) Weighted Calculation:
CN = 50

g) Soil Storage: (S)
S = (1000/CN) - 10 = 10.01 in

h) Time of Concentration (Tc):
Tc = 27 min

2) Post-Development Condition (SubBasin1):

a) Drainage Area = 2.34 acre
b) Impervious Area = 1.30 acre
c) % Impervious = 56% 98 CN
d) % Pervious = 44% 39 CN
e) Weighted Calculation:
CN = 72

f) Soil Storage: (S)
S = (1000/CN) - 10 = 3.93 in

g) Time of Concentration (Tc):
Tc = 59 min

Sandlot Inducter Yard
Basin 1

SCS Curve Number, Soil Storage, & Tc Derivation:

3) Post-Development Condition (SubBasin2):

a) Drainage Area	=	3.11 acre	
b) Impervious Area	=	0.93 acre	
c) % Impervious	=	30%	98 CN
d) % Pervious	=	70%	39 CN
e) Weighted Calculation:			
CN	**=**	**57**	

f) Soil Storage: (S)

S = (1000/CN) - 10 = 7.65 in

g) Time of Concentration (Tc):

Tc = 52 min

Sandlot Inducter Yard
Pre Development
Basin 1

Land Use Summary	
Description	**Acres**
Impervious	
Buildings	0.00
Substation Yard	0.00
Driveway and Parking	1.01
Total Impervious	**1.01**
Pervious	
Dry Detention	0.00
Dry Detention Bank	0.00
Open Space	4.44
Total Pervious	**4.44**
Total Area	**5.45**
Basin Area	**5.45**
Percent Impervious	**19%**
Percent Pervious	**81%**

Sandlot Inducter Yard

STAGE vs STORAGE

Basin 1
Pre Development

Basin Stage Ranges and Areas Data

Description	Dry Detention	Dry Detention Bank	Open Space	Substation Yard	Driveway and Parking
Acres =	**0.00**	**0.00**	**4.44**	**0.00**	**1.01**
Low Rng =	0.00	-----	3.32	-----	6.00
High Rng =	-----	-----	10.50	-----	10.10

Begin Stage Calculations = **4.00** NAVD
End Stage Calculations = **7.00** NAVD
Calculation Increment = **0.50** feet

STAGE vs. STORAGE

	Dry Detention		Dry Detention Bank		Open Space		Substation Yard		Driveway and Parking			
Storage Type Stage (NAVD)	Vertical Storage (ac.ft.)	Vertical Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Linear Storage (ac.ft.)	Linear Area (ac.)	Total Cumulative Storage (ac.ft.)	Total Area (ac)
4.00	0.00	0.00	0.00	0.00	0.14	0.42	0.00	0.00	0.00	0.00	**0.14**	**0.42**
4.50	0.00	0.00	0.00	0.00	0.43	0.73	0.00	0.00	0.00	0.00	**0.43**	**0.73**
5.00	0.00	0.00	0.00	0.00	0.87	1.04	0.00	0.00	0.00	0.00	**0.87**	**1.04**
5.50	0.00	0.00	0.00	0.00	1.47	1.35	0.00	0.00	0.00	0.00	**1.47**	**1.35**
6.00	0.00	0.00	0.00	0.00	2.22	1.66	0.00	0.00	0.00	0.00	**2.22**	**1.66**
6.50	0.00	0.00	0.00	0.00	3.12	1.96	0.00	0.00	0.03	0.12	**3.15**	**2.09**
7.00	0.00	0.00	0.00	0.00	4.18	2.27	0.00	0.00	0.12	0.25	**4.31**	**2.52**
7.50	0.00	0.00	0.00	0.00	5.40	2.58	0.00	0.00	0.28	0.37	**5.68**	**2.95**
8.00	0.00	0.00	0.00	0.00	6.77	2.89	0.00	0.00	0.49	0.49	**7.26**	**3.39**
8.50	0.00	0.00	0.00	0.00	8.29	3.20	0.00	0.00	0.77	0.62	**9.06**	**3.82**
9.00	0.00	0.00	0.00	0.00	9.97	3.51	0.00	0.00	1.11	0.74	**11.08**	**4.25**
9.50	0.00	0.00	0.00	0.00	11.80	3.82	0.00	0.00	1.51	0.87	**13.31**	**4.68**
10.00	0.00	0.00	0.00	0.00	13.78	4.13	0.00	0.00	1.98	0.99	**15.76**	**5.12**

Sandlot Inducter Yard
Post Development
Basin 1

Land Use Summary			
Description	**Sub-Basin 1 Acres**	**Sub-Basin 2 Acres**	**Basin 1 Acres**
Impervious			
Buildings	0.02	0.00	0.02
Substation Yard	1.09	0.00	1.09
Driveway and Parking	0.19	0.93	1.12
Total Impervious	**1.30**	**0.93**	**2.23**
Pervious			
Dry Detention	0.36	0.00	0.36
Dry Detention Bank	0.15	0.00	0.15
Open Space	0.53	2.18	2.71
Total Pervious	**1.04**	**2.18**	**3.22**
Total Area	**2.34**	**3.11**	**5.45**
Basin Area	**2.34**	**3.11**	**5.45**
Percent Impervious	**56%**	**30%**	**41%**
Percent Pervious	**44%**	**70%**	**59%**

Sandlot Inducter Yard

WATER QUALITY ANALYSIS

Sub-Basin 1

1 Design Information and Methods

1) The proposed treatment method is dry detention.
2) An additional 50% Water Quality Treatment Volume will be provided for discharge to an impaired waterwa
3) Upon completion of water quality treatment the site will outfall to the undeveloped lands to the south.

2 SFWMD requires for dry detention: the greater of the two (2) criteria must

Criteria 1

Requires that the volume of runoff generated by 1 inch of runoff from the developed project

Required Volume =	Area (ac.)	x	1" runoff	/	12	=		ac-ft
Required Volume =	2.34	x	1	/	12	=	0.20	ac-ft

Criteria 2

Requires the volume of runoff generated by 2.5" x percent impervious of the developed project
The Project Area is equal to the Project area less the area of roofs, preserves, lakes and wetlands.

PROJECT DATA for WATER QUALITY CALCULATIONS ONLY

a. WQ Area	=	Area (ac.)	-	Roofs	-	Preserve	-	Lakes	-	Wetlands	=		Ac.
WQ Area	=	2.34	-	0.02	-	0.00	-	0.00	-	0.00	=	2.32	Ac.

b. WQ Impervious Area	=	WQ Area	-	Pervious	=		
WQ Impervious Area	=	2.32	-	1.04	=	1.28	Ac.

c. WQ Percent Impervious $= \frac{\text{WQ Impervious Area}}{\text{WQ Area}} \times 100\% =$

WQ Percent Impervious $= \frac{1.28}{2.32} \times 100\% = 55.2\%$

Sandlot Inducter Yard

WATER QUALITY ANALYSIS

Sub-Basin 1

d. Inches treated to be treated = 2.5 inches times the percentage impervious

Inches treated	=	2.5	x	%	=		in
Inches treated	=	2.5	x	55.2%	=	1.38	in

e. WQ Required Volume = Inches treated x Area = a

WQ Required Volume	=	1.4	x	2.34	=	0.27	ac-ft

f. WQ Volume based on greater of Criteria 1 or Criteria 2:

Criteria 1	=	0.20	ac-ft
Criteria 2	=	0.27	ac-ft

WQ Volume is based on Criteria 2 = 0.27 ac-ft

3 SFWMD WQ Volume Adjustment for Discharge to Imparied Waterway

a. WQ Volume Additional Treatment for Discharge to Impaired Waterway

WQ Volume Imparied	=	WQ Reqd	x	1.5	=		ac-ft
WQ Volume Imparied	=	0.27	x	1.5	=	0.40	ac-ft

SFWMD Required Water Quality Volume = 0.40 Ac. - Ft.

Sandlot Inducter Yard

STAGE vs STORAGE

Sub-Basin 1
Post Development

Basin Stage Ranges and Areas Data

Description	Dry Detention	Dry Detention Bank	Open Space	Substation Yard	Driveway and Parking
Acres =	**0.36**	**0.15**	**0.53**	**1.09**	**0.19**
Low Rng =	4.00	4.00	7.00	10.50	6.00
High Rng =	-----	7.00	8.50	11.00	10.00

Begin Stage Calculations = **4.00** NAVD
End Stage Calculations = **11.00** NAVD
Calculation Increment = **0.50** feet

STAGE vs. STORAGE

	Dry Detention		Dry Detention Bank		Open Space		Substation Yard		Driveway and Parking			
Storage Type Stage (NAVD)	**Vertical Storage (ac.ft.)**	**Vertical Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Total Cumulative Storage (ac.ft.)**	**Total Area (ac)**
4.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.36**
4.50	0.18	0.36	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	**0.19**	**0.39**
5.00	0.36	0.36	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.00	**0.39**	**0.41**
5.50	0.54	0.36	0.06	0.08	0.00	0.00	0.00	0.00	0.00	0.00	**0.60**	**0.44**
6.00	0.72	0.36	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	**0.82**	**0.46**
6.50	0.90	0.36	0.16	0.13	0.00	0.00	0.00	0.00	0.01	0.02	**1.06**	**0.51**
7.00	1.08	0.36	0.23	0.15	0.00	0.00	0.00	0.00	0.02	0.05	**1.33**	**0.56**
7.50	1.26	0.36	0.30	0.15	0.04	0.18	0.00	0.00	0.05	0.07	**1.66**	**0.76**
8.00	1.44	0.36	0.38	0.15	0.18	0.35	0.00	0.00	0.10	0.10	**2.09**	**0.96**
8.50	1.62	0.36	0.45	0.15	0.40	0.53	0.00	0.00	0.15	0.12	**2.62**	**1.16**
9.00	1.80	0.36	0.53	0.15	0.66	0.53	0.00	0.00	0.21	0.14	**3.20**	**1.18**
9.50	1.98	0.36	0.60	0.15	0.93	0.53	0.00	0.00	0.29	0.17	**3.80**	**1.21**
10.00	2.16	0.36	0.68	0.15	1.19	0.53	0.00	0.00	0.38	0.19	**4.41**	**1.23**

Sandlot Inducter Yard

STAGE vs STORAGE

Sub-Basin 1
Post Development

Basin Stage Ranges and Areas Data

Description	Dry Detention	Dry Detention Bank	Open Space	Substation Yard	Driveway and Parking
Acres =	**0.36**	**0.15**	**0.53**	**1.09**	**0.19**
Low Rng =	4.00	4.00	7.00	10.50	6.00
High Rng =	-----	7.00	8.50	11.00	10.00

Begin Stage Calculations = **4.00** NAVD
End Stage Calculations = **11.00** NAVD
Calculation Increment = **0.50** feet

STAGE vs. STORAGE

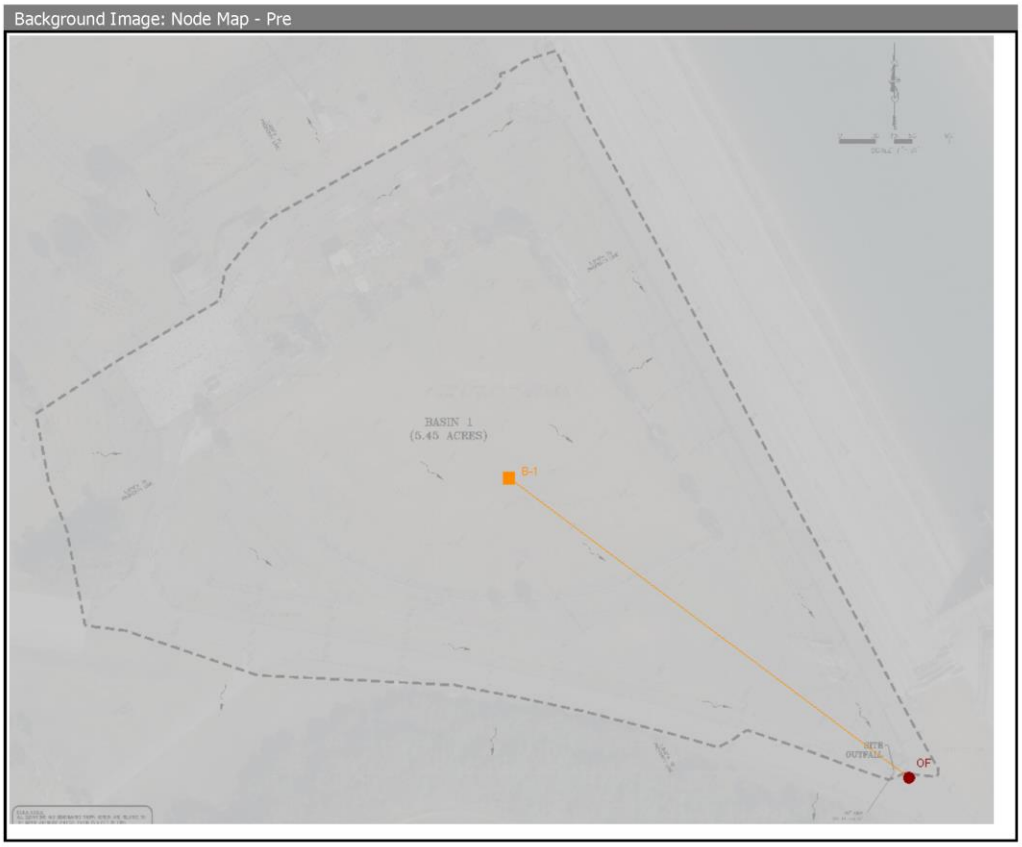
	Dry Detention		Dry Detention Bank		Open Space		Substation Yard		Driveway and Parking			
Storage Type Stage (NAVD)	**Vertical Storage (ac.ft.)**	**Vertical Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Linear Storage (ac.ft.)**	**Linear Area (ac.)**	**Total Cumulative Storage (ac.ft.)**	**Total Area (ac)**
10.50	2.34	0.36	0.75	0.15	1.46	0.53	0.00	0.00	0.48	0.19	**5.02**	**1.23**
11.00	2.52	0.36	0.83	0.15	1.72	0.53	0.27	1.09	0.57	0.19	**5.91**	**2.32**
11.50	2.70	0.36	0.90	0.15	1.99	0.53	0.82	1.09	0.67	0.19	**7.07**	**2.32**
12.00	2.88	0.36	0.98	0.15	2.25	0.53	1.36	1.09	0.76	0.19	**8.23**	**2.32**

Required WQ Vol. 0.40 ac-ft
Required WQ Stage 5.07 NAVD
Provided WQ Stage 5.07 NAVD
Provided WQ Vol. 0.40 ac-ft

Appendix 2 – ICPR Modeling Results

21-197 FPL Sandlot Inductor Yard
Pre-Development
Node Map

1



21-197 FPL Sandlot Inductor Yard
Pre-Development
25 Year, 3 Day Storm Event - Basin Max. Report

Manual Basin Runoff Summary [Pre]

Basin Name	Sim Name	Max Flow [cfs]	Time to Max Flow [hrs]	Total Rainfall [in]	Total Runoff [in]	Area [ac]	Equivalent Curve Number	% Imperv	% DCIA
B-1	25y-3d	5.89	60.5167	10.00	3.56	5.4500	50.0	0.00	0.00

21-197 FPL Sandlot Inductor Yard
Pre-Development
Input File

Manual Basin: B-1

Scenario: Pre
Node: OF
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 59.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH323
Peaking Factor: 323.0
Area: 5.4500 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
5.4500	B-1	B-1	

Comment:

Node: OF

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 4.00 ft
Warning Stage: 5.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	4.00
0	0	0	999.0000	4.00

Comment:

Simulation: 25y-3d

Scenario: Pre
Run Date/Time: 5/9/2022 9:00:06 AM
Program Version: ICPR4 4.07.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000

21-197 FPL Sandlot Inductor Yard
Pre-Development
Input File

Max Calculation Time: 30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Pre
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Pre

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: ~SFWMD-72
Rainfall Amount: 10.00 in
Storm Duration: 72.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

21-197 FPL Sandlot Inductor Yard
Pre-Development
Input File

Impervious: Pre [Set]

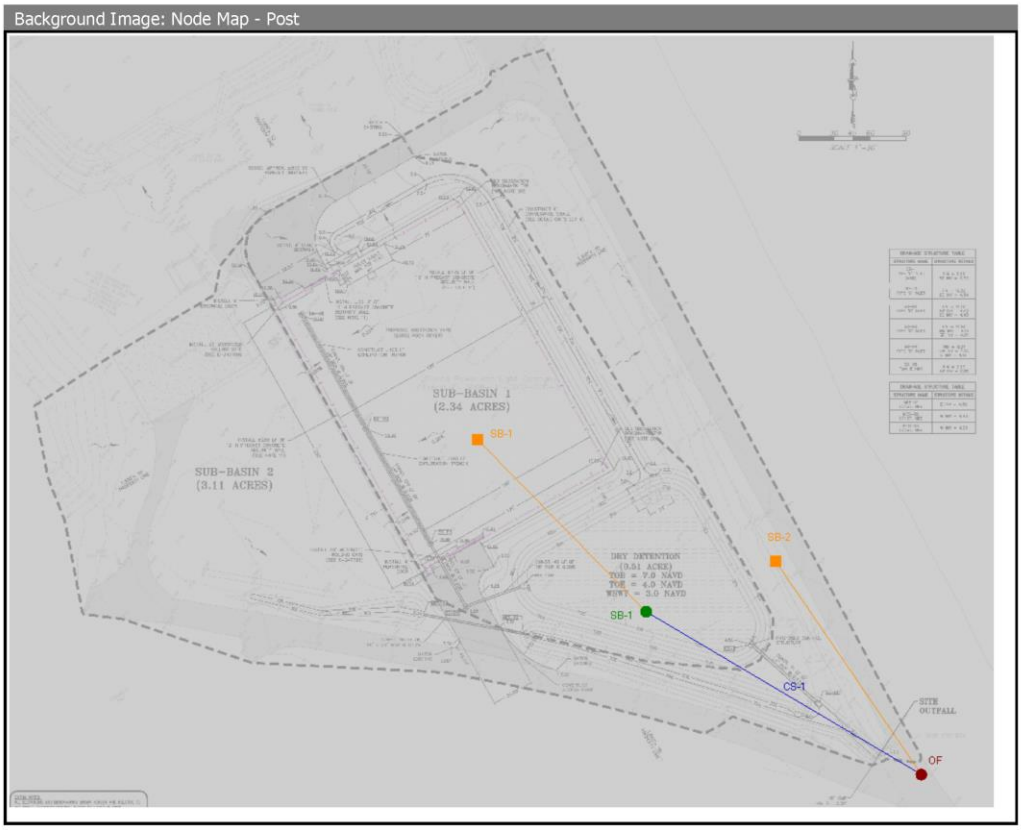
Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
B-1	0.00	0.00	0.00	0.000	0.000

Curve Number: Pre [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
B-1	B-1	50.0

21-197 FPL Sandlot Inductor Yard
Post-Development
Node Map

1



21-197 FPL Sandlot Inductor Yard
Post-Development
10 Year, 1 Day Storm Event - Node Max. Report

Node Max Conditions w/ Times [Post]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
OF	10y-1d	5.00	4.00	0.0000	1.90	0.00	0	0.0000	0.0000	12.6489	0.0000
SB-1	10y-1d	7.00	5.06	0.0010	2.63	0.23	18010	19.0388	12.5309	12.5664	18.9888

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Storm Event - Node Max. Report

Node Max Conditions w/ Times [Post]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
OF	25y-3d	5.00	4.00	0.0000	4.72	0.00	0	0.0000	0.0000	60.4332	0.0000
SB-1	25y-3d	7.00	5.70	0.0010	4.53	1.11	19523	62.6530	60.1977	60.4160	62.6447

21-197 FPL Sandlot Inductor Yard
Post-Development
100 Year, 3 Day - Zero Discharge Storm Event - Node Max. Report

Node Max Conditions w/ Times [Post]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]	Time to Max Stage [hr]	Time to Min/Max Delta Stage [hr]	Time to Max Total Inflow [hr]	Time to Max Total Outflow [hr]
SB-1	100y-3d	7.00	7.48	0.0010	5.75	0.00	32704	76.62	58.54	60.42	0.00

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Storm Event - Time Series Report

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	25y-3d	SB-1	0.00	4.00
Post	25y-3d	SB-1	1.00	4.00
Post	25y-3d	SB-1	2.00	4.00
Post	25y-3d	SB-1	3.00	4.00
Post	25y-3d	SB-1	4.00	4.00
Post	25y-3d	SB-1	5.00	4.00
Post	25y-3d	SB-1	6.00	4.00
Post	25y-3d	SB-1	7.00	4.00
Post	25y-3d	SB-1	8.00	4.00
Post	25y-3d	SB-1	9.00	4.00
Post	25y-3d	SB-1	10.00	4.00
Post	25y-3d	SB-1	11.00	4.00
Post	25y-3d	SB-1	12.00	4.00
Post	25y-3d	SB-1	13.00	4.00
Post	25y-3d	SB-1	14.00	4.00
Post	25y-3d	SB-1	15.00	4.00
Post	25y-3d	SB-1	16.00	4.00
Post	25y-3d	SB-1	17.00	4.00
Post	25y-3d	SB-1	18.00	4.00
Post	25y-3d	SB-1	19.00	4.00
Post	25y-3d	SB-1	20.00	4.00
Post	25y-3d	SB-1	21.00	4.00
Post	25y-3d	SB-1	22.00	4.00
Post	25y-3d	SB-1	23.00	4.01
Post	25y-3d	SB-1	24.00	4.01
Post	25y-3d	SB-1	25.00	4.01
Post	25y-3d	SB-1	26.00	4.02
Post	25y-3d	SB-1	27.00	4.02
Post	25y-3d	SB-1	28.00	4.03
Post	25y-3d	SB-1	29.00	4.04
Post	25y-3d	SB-1	30.00	4.04
Post	25y-3d	SB-1	31.00	4.05
Post	25y-3d	SB-1	32.00	4.06
Post	25y-3d	SB-1	33.00	4.07
Post	25y-3d	SB-1	34.00	4.08
Post	25y-3d	SB-1	35.00	4.09
Post	25y-3d	SB-1	36.00	4.10
Post	25y-3d	SB-1	37.00	4.11
Post	25y-3d	SB-1	38.00	4.12
Post	25y-3d	SB-1	39.00	4.12
Post	25y-3d	SB-1	40.00	4.13
Post	25y-3d	SB-1	41.00	4.14

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Storm Event - Time Series Report

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	25y-3d	SB-1	42.00	4.15
Post	25y-3d	SB-1	43.00	4.16
Post	25y-3d	SB-1	44.00	4.17
Post	25y-3d	SB-1	45.00	4.17
Post	25y-3d	SB-1	46.00	4.18
Post	25y-3d	SB-1	47.00	4.19
Post	25y-3d	SB-1	48.00	4.19
Post	25y-3d	SB-1	49.00	4.20
Post	25y-3d	SB-1	50.00	4.21
Post	25y-3d	SB-1	51.00	4.22
Post	25y-3d	SB-1	52.00	4.23
Post	25y-3d	SB-1	53.00	4.24
Post	25y-3d	SB-1	54.00	4.26
Post	25y-3d	SB-1	55.00	4.29
Post	25y-3d	SB-1	56.00	4.33
Post	25y-3d	SB-1	57.00	4.38
Post	25y-3d	SB-1	58.00	4.44
Post	25y-3d	SB-1	59.00	4.51
Post	25y-3d	SB-1	60.00	4.70
Post	25y-3d	SB-1	61.00	5.41
Post	25y-3d	SB-1	62.00	5.67
Post	25y-3d	SB-1	63.00	5.70
Post	25y-3d	SB-1	64.00	5.64
Post	25y-3d	SB-1	65.00	5.56
Post	25y-3d	SB-1	66.00	5.48
Post	25y-3d	SB-1	67.00	5.41
Post	25y-3d	SB-1	68.00	5.36
Post	25y-3d	SB-1	69.00	5.32
Post	25y-3d	SB-1	70.00	5.28
Post	25y-3d	SB-1	71.00	5.24
Post	25y-3d	SB-1	72.00	5.21

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Recovery Analysis

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	Recovery	SB-1	0.00	5.21
Post	Recovery	SB-1	1.00	5.15
Post	Recovery	SB-1	2.00	5.10
Post	Recovery	SB-1	3.00	5.05
Post	Recovery	SB-1	4.00	5.01
Post	Recovery	SB-1	5.00	4.97
Post	Recovery	SB-1	6.00	4.92
Post	Recovery	SB-1	7.00	4.88
Post	Recovery	SB-1	8.00	4.84
Post	Recovery	SB-1	9.00	4.80
Post	Recovery	SB-1	10.00	4.76
Post	Recovery	SB-1	11.00	4.72
Post	Recovery	SB-1	12.00	4.68
Post	Recovery	SB-1	13.00	4.65
Post	Recovery	SB-1	14.00	4.61
Post	Recovery	SB-1	15.00	4.58
Post	Recovery	SB-1	16.00	4.54
Post	Recovery	SB-1	17.00	4.51
Post	Recovery	SB-1	18.00	4.48
Post	Recovery	SB-1	19.00	4.45
Post	Recovery	SB-1	20.00	4.42
Post	Recovery	SB-1	21.00	4.40
Post	Recovery	SB-1	22.00	4.37
Post	Recovery	SB-1	23.00	4.35
Post	Recovery	SB-1	24.00	4.32
Post	Recovery	SB-1	25.00	4.30
Post	Recovery	SB-1	26.00	4.28
Post	Recovery	SB-1	27.00	4.26
Post	Recovery	SB-1	28.00	4.24
Post	Recovery	SB-1	29.00	4.23
Post	Recovery	SB-1	30.00	4.21
Post	Recovery	SB-1	31.00	4.20
Post	Recovery	SB-1	32.00	4.19
Post	Recovery	SB-1	33.00	4.18
Post	Recovery	SB-1	34.00	4.17
Post	Recovery	SB-1	35.00	4.16
Post	Recovery	SB-1	36.00	4.15
Post	Recovery	SB-1	37.00	4.14
Post	Recovery	SB-1	38.00	4.14
Post	Recovery	SB-1	39.00	4.13
Post	Recovery	SB-1	40.00	4.12
Post	Recovery	SB-1	41.00	4.12

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Recovery Analysis

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	Recovery	SB-1	42.00	4.11
Post	Recovery	SB-1	43.00	4.11
Post	Recovery	SB-1	44.00	4.10
Post	Recovery	SB-1	45.00	4.10
Post	Recovery	SB-1	46.00	4.10
Post	Recovery	SB-1	47.00	4.09
Post	Recovery	SB-1	48.00	4.09
Post	Recovery	SB-1	49.00	4.09
Post	Recovery	SB-1	50.00	4.08
Post	Recovery	SB-1	51.00	4.08
Post	Recovery	SB-1	52.00	4.08
Post	Recovery	SB-1	53.00	4.08
Post	Recovery	SB-1	54.00	4.07
Post	Recovery	SB-1	55.00	4.07
Post	Recovery	SB-1	56.00	4.07
Post	Recovery	SB-1	57.00	4.07
Post	Recovery	SB-1	58.00	4.07
Post	Recovery	SB-1	59.00	4.07
Post	Recovery	SB-1	60.00	4.06
Post	Recovery	SB-1	61.00	4.06
Post	Recovery	SB-1	62.00	4.06
Post	Recovery	SB-1	63.00	4.06
Post	Recovery	SB-1	64.00	4.06
Post	Recovery	SB-1	65.00	4.06
Post	Recovery	SB-1	66.00	4.06
Post	Recovery	SB-1	67.00	4.05
Post	Recovery	SB-1	68.00	4.05
Post	Recovery	SB-1	69.00	4.05
Post	Recovery	SB-1	70.00	4.05
Post	Recovery	SB-1	71.00	4.05
Post	Recovery	SB-1	72.00	4.05
Post	Recovery	SB-1	73.00	4.05
Post	Recovery	SB-1	74.00	4.05
Post	Recovery	SB-1	75.00	4.05
Post	Recovery	SB-1	76.00	4.05
Post	Recovery	SB-1	77.00	4.04
Post	Recovery	SB-1	78.00	4.04
Post	Recovery	SB-1	79.00	4.04
Post	Recovery	SB-1	80.00	4.04
Post	Recovery	SB-1	81.00	4.04
Post	Recovery	SB-1	82.00	4.04
Post	Recovery	SB-1	83.00	4.04

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Recovery Analysis

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	Recovery	SB-1	84.00	4.04
Post	Recovery	SB-1	85.00	4.04
Post	Recovery	SB-1	86.00	4.04
Post	Recovery	SB-1	87.00	4.04
Post	Recovery	SB-1	88.00	4.04
Post	Recovery	SB-1	89.00	4.04
Post	Recovery	SB-1	90.00	4.04
Post	Recovery	SB-1	91.00	4.04
Post	Recovery	SB-1	92.00	4.03
Post	Recovery	SB-1	93.00	4.03
Post	Recovery	SB-1	94.00	4.03
Post	Recovery	SB-1	95.00	4.03
Post	Recovery	SB-1	96.00	4.03
Post	Recovery	SB-1	97.00	4.03
Post	Recovery	SB-1	98.00	4.03
Post	Recovery	SB-1	99.00	4.03
Post	Recovery	SB-1	100.00	4.03
Post	Recovery	SB-1	101.00	4.03
Post	Recovery	SB-1	102.00	4.03
Post	Recovery	SB-1	103.00	4.03
Post	Recovery	SB-1	104.00	4.03
Post	Recovery	SB-1	105.00	4.03
Post	Recovery	SB-1	106.00	4.03
Post	Recovery	SB-1	107.00	4.03
Post	Recovery	SB-1	108.00	4.03
Post	Recovery	SB-1	109.00	4.03
Post	Recovery	SB-1	110.00	4.03
Post	Recovery	SB-1	111.00	4.03
Post	Recovery	SB-1	112.00	4.03
Post	Recovery	SB-1	113.00	4.03
Post	Recovery	SB-1	114.00	4.03
Post	Recovery	SB-1	115.00	4.03
Post	Recovery	SB-1	116.00	4.03
Post	Recovery	SB-1	117.00	4.03
Post	Recovery	SB-1	118.00	4.03
Post	Recovery	SB-1	119.00	4.03
Post	Recovery	SB-1	120.00	4.02
Post	Recovery	SB-1	121.00	4.02
Post	Recovery	SB-1	122.00	4.02
Post	Recovery	SB-1	123.00	4.02
Post	Recovery	SB-1	124.00	4.02
Post	Recovery	SB-1	125.00	4.02

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Recovery Analysis

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	Recovery	SB-1	126.00	4.02
Post	Recovery	SB-1	127.00	4.02
Post	Recovery	SB-1	128.00	4.02
Post	Recovery	SB-1	129.00	4.02
Post	Recovery	SB-1	130.00	4.02
Post	Recovery	SB-1	131.00	4.02
Post	Recovery	SB-1	132.00	4.02
Post	Recovery	SB-1	133.00	4.02
Post	Recovery	SB-1	134.00	4.02
Post	Recovery	SB-1	135.00	4.02
Post	Recovery	SB-1	136.00	4.02
Post	Recovery	SB-1	137.00	4.02
Post	Recovery	SB-1	138.00	4.02
Post	Recovery	SB-1	139.00	4.02
Post	Recovery	SB-1	140.00	4.02
Post	Recovery	SB-1	141.00	4.02
Post	Recovery	SB-1	142.00	4.02
Post	Recovery	SB-1	143.00	4.02
Post	Recovery	SB-1	144.00	4.02
Post	Recovery	SB-1	145.00	4.02
Post	Recovery	SB-1	146.00	4.02
Post	Recovery	SB-1	147.00	4.02
Post	Recovery	SB-1	148.00	4.02
Post	Recovery	SB-1	149.00	4.02
Post	Recovery	SB-1	150.00	4.02
Post	Recovery	SB-1	151.00	4.02
Post	Recovery	SB-1	152.00	4.02
Post	Recovery	SB-1	153.00	4.02
Post	Recovery	SB-1	154.00	4.02
Post	Recovery	SB-1	155.00	4.02
Post	Recovery	SB-1	156.00	4.02
Post	Recovery	SB-1	157.00	4.02
Post	Recovery	SB-1	158.00	4.02
Post	Recovery	SB-1	159.00	4.02
Post	Recovery	SB-1	160.00	4.02
Post	Recovery	SB-1	161.00	4.02
Post	Recovery	SB-1	162.00	4.02
Post	Recovery	SB-1	163.00	4.02
Post	Recovery	SB-1	164.00	4.02
Post	Recovery	SB-1	165.00	4.02
Post	Recovery	SB-1	166.00	4.02
Post	Recovery	SB-1	167.00	4.02

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Recovery Analysis

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	Recovery	SB-1	168.00	4.02
Post	Recovery	SB-1	169.00	4.02
Post	Recovery	SB-1	170.00	4.02
Post	Recovery	SB-1	171.00	4.02
Post	Recovery	SB-1	172.00	4.02
Post	Recovery	SB-1	173.00	4.02
Post	Recovery	SB-1	174.00	4.02
Post	Recovery	SB-1	175.00	4.02
Post	Recovery	SB-1	176.00	4.02
Post	Recovery	SB-1	177.00	4.02
Post	Recovery	SB-1	178.00	4.02
Post	Recovery	SB-1	179.00	4.02
Post	Recovery	SB-1	180.00	4.02
Post	Recovery	SB-1	181.00	4.02
Post	Recovery	SB-1	182.00	4.02
Post	Recovery	SB-1	183.00	4.02
Post	Recovery	SB-1	184.00	4.02
Post	Recovery	SB-1	185.00	4.02
Post	Recovery	SB-1	186.00	4.01
Post	Recovery	SB-1	187.00	4.01
Post	Recovery	SB-1	188.00	4.01
Post	Recovery	SB-1	189.00	4.01
Post	Recovery	SB-1	190.00	4.01
Post	Recovery	SB-1	191.00	4.01
Post	Recovery	SB-1	192.00	4.01
Post	Recovery	SB-1	193.00	4.01
Post	Recovery	SB-1	194.00	4.01
Post	Recovery	SB-1	195.00	4.01
Post	Recovery	SB-1	196.00	4.01
Post	Recovery	SB-1	197.00	4.01
Post	Recovery	SB-1	198.00	4.01
Post	Recovery	SB-1	199.00	4.01
Post	Recovery	SB-1	200.00	4.01
Post	Recovery	SB-1	201.00	4.01
Post	Recovery	SB-1	202.00	4.01
Post	Recovery	SB-1	203.00	4.01
Post	Recovery	SB-1	204.00	4.01
Post	Recovery	SB-1	205.00	4.01
Post	Recovery	SB-1	206.00	4.01
Post	Recovery	SB-1	207.00	4.01
Post	Recovery	SB-1	208.00	4.01
Post	Recovery	SB-1	209.00	4.01

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Recovery Analysis

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	Recovery	SB-1	210.00	4.01
Post	Recovery	SB-1	211.00	4.01
Post	Recovery	SB-1	212.00	4.01
Post	Recovery	SB-1	213.00	4.01
Post	Recovery	SB-1	214.00	4.01
Post	Recovery	SB-1	215.00	4.01
Post	Recovery	SB-1	216.00	4.01
Post	Recovery	SB-1	217.00	4.01
Post	Recovery	SB-1	218.00	4.01
Post	Recovery	SB-1	219.00	4.01
Post	Recovery	SB-1	220.00	4.01
Post	Recovery	SB-1	221.00	4.01
Post	Recovery	SB-1	222.00	4.01
Post	Recovery	SB-1	223.00	4.01
Post	Recovery	SB-1	224.00	4.01
Post	Recovery	SB-1	225.00	4.01
Post	Recovery	SB-1	226.00	4.01
Post	Recovery	SB-1	227.00	4.01
Post	Recovery	SB-1	228.00	4.01
Post	Recovery	SB-1	229.00	4.01
Post	Recovery	SB-1	230.00	4.01
Post	Recovery	SB-1	231.00	4.01
Post	Recovery	SB-1	232.00	4.01
Post	Recovery	SB-1	233.00	4.01
Post	Recovery	SB-1	234.00	4.01
Post	Recovery	SB-1	235.00	4.01
Post	Recovery	SB-1	236.00	4.01
Post	Recovery	SB-1	237.00	4.01
Post	Recovery	SB-1	238.00	4.01
Post	Recovery	SB-1	239.00	4.01
Post	Recovery	SB-1	240.00	4.01
Post	Recovery	SB-1	241.00	4.01
Post	Recovery	SB-1	242.00	4.01
Post	Recovery	SB-1	243.00	4.01
Post	Recovery	SB-1	244.00	4.01
Post	Recovery	SB-1	245.00	4.01
Post	Recovery	SB-1	246.00	4.01
Post	Recovery	SB-1	247.00	4.01
Post	Recovery	SB-1	248.00	4.01
Post	Recovery	SB-1	249.00	4.01
Post	Recovery	SB-1	250.00	4.01
Post	Recovery	SB-1	251.00	4.01

21-197 FPL Sandlot Inductor Yard
Post-Development
25 Year, 3 Day Recovery Analysis

Scenario	Sim	Node Name	Relative Time [hrs]	Stage [ft]
Post	Recovery	SB-1	252.00	4.01
Post	Recovery	SB-1	253.00	4.01
Post	Recovery	SB-1	254.00	4.01
Post	Recovery	SB-1	255.00	4.01
Post	Recovery	SB-1	256.00	4.01
Post	Recovery	SB-1	257.00	4.01
Post	Recovery	SB-1	258.00	4.01
Post	Recovery	SB-1	259.00	4.01
Post	Recovery	SB-1	260.00	4.01
Post	Recovery	SB-1	261.00	4.01
Post	Recovery	SB-1	262.00	4.01
Post	Recovery	SB-1	263.00	4.01
Post	Recovery	SB-1	264.00	4.01
Post	Recovery	SB-1	265.00	4.01
Post	Recovery	SB-1	266.00	4.01
Post	Recovery	SB-1	267.00	4.01
Post	Recovery	SB-1	268.00	4.01
Post	Recovery	SB-1	269.00	4.01
Post	Recovery	SB-1	270.00	4.01
Post	Recovery	SB-1	271.00	4.01
Post	Recovery	SB-1	272.00	4.01
Post	Recovery	SB-1	273.00	4.01
Post	Recovery	SB-1	274.00	4.01
Post	Recovery	SB-1	275.00	4.01
Post	Recovery	SB-1	276.00	4.01
Post	Recovery	SB-1	277.00	4.01
Post	Recovery	SB-1	278.00	4.01
Post	Recovery	SB-1	279.00	4.01
Post	Recovery	SB-1	280.00	4.01
Post	Recovery	SB-1	281.00	4.01
Post	Recovery	SB-1	282.00	4.01
Post	Recovery	SB-1	283.00	4.01
Post	Recovery	SB-1	284.00	4.01
Post	Recovery	SB-1	285.00	4.01
Post	Recovery	SB-1	286.00	4.01
Post	Recovery	SB-1	287.00	4.01
Post	Recovery	SB-1	288.00	4.01

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

Manual Basin: SB-1

Scenario: Post
Node: SB-1
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 52.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH323
Peaking Factor: 323.0
Area: 2.3400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
2.3400	SB-1	SB-1	

Comment:

Manual Basin: SB-2

Scenario: Post
Node: OF
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 52.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH323
Peaking Factor: 323.0
Area: 3.1100 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name
3.1100	SB-2	SB-2	

Comment:

Node: OF

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 4.00 ft
Warning Stage: 5.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	4.00
0	0	0	999.0000	4.00

Comment:

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

Node: SB-1

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 4.00 ft
Warning Stage: 7.00 ft

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.3600	15682
4.50	0.3900	16988
5.00	0.4100	17860
5.50	0.4400	19166
6.00	0.4600	20038
6.50	0.5100	22216
7.00	0.5600	24394
7.50	0.7600	33106
8.00	0.9600	41818
8.50	1.1600	50530
9.00	1.1800	51401
9.50	1.2100	52708
10.00	1.2300	53579
10.50	1.2300	53579
11.00	2.3200	101059
11.50	2.3200	101059
12.00	2.3200	101059

Comment:

Drop Structure Link: CS-1		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	3.50 ft	Invert:	3.32 ft
From Node:	SB-1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	OF	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	30.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.50	Op Table:		Op Table:	
Exit Loss Coef:	1.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Circular	Op Table:	
Invert:	4.00 ft	Ref Node:	
Control Elevation:	4.00 ft	**Discharge Coefficients**	
Max Depth:	0.25 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	5.07 ft	Ref Node:	
Control Elevation:	5.07 ft	**Discharge Coefficients**	
Max Depth:	999.00 ft	Weir Default:	3.200
Max Width:	0.50 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Simulation: 100y-3d

Scenario: Post
Run Date/Time: 5/9/2022 12:05:28 PM
Program Version: ICPR4 4.07.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

Hydrology [sec]	Surface Hydraulics

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

		[sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Post

Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Post

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name: ~SFWMD-72
Rainfall Amount: 12.10 in
Storm Duration: 72.0000 hr

Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

Simulation: 10y-1d

Scenario: Post
Run Date/Time: 5/9/2022 12:07:16 PM
Program Version: ICPR4 4.07.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Post
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Post

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain: Global

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

		Opt:	
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FLMOD
		Rainfall Amount:	6.18 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 25y-3d

Scenario: Post
Run Date/Time: 5/9/2022 12:07:26 PM
Program Version: ICPR4 4.07.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	80.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

Resources		Lookup Tables	
Rainfall Folder:		Boundary Stage Set:	
		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	Post
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	Post

Tolerances & Options			
Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	10.00 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: Recovery

Scenario: Post
Run Date/Time: 5/9/2022 12:07:33 PM
Program Version: ICPR4 4.07.01

General

Run Mode: Hot Start
Hot Start Simulation: 25y-3d

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	288.0000
Hot Start Time:	0	0	0	72.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: Post

Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Post

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr

Smp/Man Basin Rain Opt: Global

Rainfall Name:
Rainfall Amount: 0.00 in
Storm Duration: 0.0000 hr

Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Impervious: Post [Set]

21-197 FPL Sandlot Inductor Yard
Post-Development
Input File

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
SB-1	0.00	0.00	0.00	0.000	0.000
SB-2	0.00	0.00	0.00	0.000	0.000

Curve Number: Post [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
SB-1	SB-1	72.0
SB-2	SB-2	57.0

Appendix 3 – Soils Map



Soil Map—St. Lucie County, Florida

Map Unit Legend

Map Unit Symbol	Map Unit Name
5	Arents, 45 to 65 percent slopes
100	Waters of the Atlantic Ocean

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FPL SANDLOT INDUCTOR YARD

SOILS MAP EXCERPT

JOB NO: 21–197	SCALE: NTS
DRAWN BY: JKILLIAN	DATE: 5/20/2022

Appendix 4 – Geotechnical Report

Subsurface Soil Exploration
and Geotechnical Engineering Evaluation
Proposed FPL St. Lucie Switchyard Expansion
FPL St. Lucie Nuclear Power Plant
St. Lucie County, Florida



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AAI File No. 13-5449
October 3, 2013

Florida Power & Light Company
Switchyard and Substation Siting Group
700 Universe Boulevard TS4/JW
Juno Beach, Florida 33408-0420

Attention: Mr. Jose S. Rodriguez

Subject: Subsurface Soil Exploration and Geotechnical Engineering Evaluation St. Lucie Switchyard Expansion FPL St. Lucie Nuclear Power Plant St. Lucie County, Florida

Mr. Rodriguez:

INTRODUCTION

In accordance with your request and authorization, Ardaman & Associates, Inc. has completed a subsurface soil exploration and geotechnical engineering evaluation for the above referenced project. We explored the general subsurface conditions in order to evaluate their suitability for supporting the proposed construction, to obtain a measure of pertinent engineering properties of subsurface materials, and to provide recommendations for site preparation and foundation design. Our work included Standard Penetration Test (SPT) borings, auger borings, permeability testing and engineering analyses. This report describes our explorations and tests, reports their findings, and summarizes our conclusions and recommendations.

SITE LOCATION AND PROJECT DESCRIPTION

The existing FPL St. Lucie Switchyard is located on the western portion of the FPL St. Lucie Nuclear Power Plant in eastern St. Lucie County, Florida. The subject site is situated in Section 16, Township 36 South and Range 41 East. The site location is shown superimposed on a composite of the 1948 Fort Pierce and Eden, Florida USGS Quadrangle Maps (photorevised 1983) presented as Figure 1. It is our understanding that the switchyard facility will be expanded to the south. At the time our field explorations were performed, the area south of the switchyard was grassed with the exception of an asphalt access road that is located along the southern border of the existing switchyard facility.

PROJECT DESCRIPTION

We have examined a Soil Boring Plan prepared by FPL Power Systems and dated July 23, 2013. Details of this plan have been reproduced as our Boring Location Plan, Figure 2. It is our understanding that the electrical equipment to be installed as part of the switchyard expansion will be supported on deep foundations. The expanded switchyard will be covered with a thin layer of gravel underlain by a layer of base material, and will be enclosed by a perimeter chain-link fence.

460 NW Concourse Place, Unit 1, Port St. Lucie, Florida 34986 Phone (772) 878-0072 Fax (772) 878-0097
Florida: Bartow, Cocoa, Fort Myers, Miami, Orlando, Port St. Lucie, Sarasota, Tallahassee, Tampa, West Palm Beach
Louisiana: Alexandria, Baton Rouge, Monroe, New Orleans, Shreveport

FIELD EXPLORATION

Standard Penetration Test (SPT) Borings

To explore the subsurface conditions within the proposed switchyard expansion area, three Standard Penetration Test (SPT) borings were performed at the locations shown on Figure 2. The borings were performed at the closest safely accessible locations for our truck-mounted drilling equipment that were selected based on the proximity of identified underground utilities and from discussions with representatives of FPL. The SPT borings were terminated at depths of 40 and 50 feet below the existing ground surface.

Auger Borings

Two auger borings were also performed within the existing stormwater retention area to the south of the proposed switchyard expansion area at the approximate locations shown on Figure 2. The auger borings were completed at a depth of 10 feet below the existing ground surface using a truck-mounted, 4-inch diameter continuous flight auger.

The groundwater level at each of the boring locations was measured on the date drilled. The boreholes were then backfilled with accumulated soil cuttings. The soil boring logs and a description of our drilling procedures are attached.

Field Exfiltration Test

In order to estimate the hydraulic conductivity of the shallow soils, a constant-head exfiltration test (Exfil-1) was performed at a location within the existing stormwater retention pond, as shown on Figure 2. The test was performed in general accordance with the methods described in the South Florida Water Management District (SFWMD) Permit Information Manual, Volume IV. Descriptions of the soils observed in the exfiltration test borehole and the test result are presented in the Appendix. The result of the exfiltration test indicated a hydraulic conductivity (K) value of 1.5×10^{-4} cfs/ft^2-ft head.

Double-Ring Infiltration Test

A double-ring infiltration test (DRI-1) was performed within the retention pond area in general accordance with ASTM D3385 at the approximate location shown on Figure 2. The near surface soils consisted of brown fine sand (Unified Soil Classification SP) with trace amounts of shell fragments to a depth of at least 5 feet. The groundwater table level was encountered at approximately 6.5 feet below the ground surface on the date of the test. The results of the double-ring infiltration test indicated a soil infiltration rate of 8 inches/hour.

Test Locations

The boring and test locations were laid out in the field in reference to existing site features and by referencing a hand-held GPS device using the latitude and longitude coordinates provided by FPL staff. We estimate that the actual boring locations are within approximately 10 feet of the locations shown in Figure 2. The soil samples recovered from our explorations will be kept in our laboratory for 60 days, then discarded unless you request otherwise.

LABORATORY TESTING

Our drillers examined the soil recovered from the SPT sampler or auger, placed the recovered soil samples in moisture proof containers, and maintained a log for each boring. The field soil boring logs and recovered soil samples were transported to our soils laboratory from the project site. Each soil sample was then examined by a geotechnical engineer and visually classified in general accordance with the Unified Soil Classification System (USCS). Percent fines content and moisture content tests were performed on select samples to aid in the classifications. The resulting soil classifications and other pertinent data obtained from our explorations and laboratory examinations and tests are reported on the attached soil boring logs.

GENERAL SUBSURFACE CONDITIONS

The boring logs present a detailed description of the soils encountered at the locations and the depths explored. The soil stratification shown on the boring logs is based on examination of recovered soil samples and interpretation of the driller's field logs. It indicates only the approximate boundaries between soil types. The actual transitions between adjacent soil strata may be gradual and indistinct.

As shown by the soil boring logs, the soils at the SPT boring locations consist generally of very loose to medium dense fine sand (Unified Soil Classification SP), slightly silty fine sand (SP-SM) and silty fine sand (SM) with varying amounts of shell fragments and partially cemented sand and shell extending to the termination depth of the deepest borings at 50 feet. We note that hard drilling due to intermittent layers of cemented sand and shell was noted in the drilling logs below a depth of 35 feet. The auger borings generally encountered brown and gray to greenish gray fine sand (SP), slightly silty fine sand (SP-SM) and silty fine sand (SM) to a depth of 10 feet. We note that very clayey fine sand (SC) was also encountered between depths of 4.5 and 6 feet below existing ground surface in the auger borings conducted within the existing dry retention pond area.

GROUNDWATER CONDITIONS

Our drillers observed groundwater in the boreholes at depths ranging from 6.5 to 8.1 feet below the existing ground surface, as noted on the attached boring logs. We note that the ground surface elevations at the locations of Borings B-1 and B-2 were approximately 2.5 to 3 feet higher than the rest of the borings since they were performed adjacent to the elevated access roadway on the south side of the existing switchyard. Fluctuations in groundwater levels on this site should be anticipated throughout the year due to a variety of factors, the most important of which is recharge from rainfall. Groundwater levels somewhat above the present levels should be expected after periods of heavy rains. Groundwater may also temporarily “perch” atop the shallow very clayey and silty soils encountered below depths of 4.5 and 5 feet at the auger boring locations.

NORMAL SEASONAL HIGH GROUNDWATER LEVEL

The normal seasonal high groundwater level each year is the level in the August-September period at the end of the rainy season during a year of normal (average) rainfall. The water table elevations associated with a flood would be much higher than the normal seasonal high groundwater level. The normal high water levels would more approximate the normal seasonal high groundwater levels.

The seasonal high groundwater level is affected by a number of factors. The drainage characteristics of the soils, the land surface elevation, relief points such as drainage ditches, lakes, rivers, swamp areas, etc., and distance to relief points are some of the more important factors influencing the seasonal high groundwater level.

Based on our interpretation of the site conditions using the soil borings and the Soil Survey, we preliminarily estimate the normal seasonal high groundwater level at the site to be approximately 1 to 1½ feet above the groundwater level measured in the boreholes at the time of our field exploration. Additional explorations including borings to deeper depths and monitoring wells could be conducted prior to final design in order to further explore the normal seasonal high groundwater table estimate.

The project drainage engineer should take into consideration that, after periods of heavy and/or prolonged rainfall, water may perch at shallower depths atop the near-surface hardpan-type and clayey soils at the site. This also indicates that the water table may temporarily rise above the ground surface at some areas on the site following periods of heavy or prolonged rainfall.

DISCUSSIONS AND RECOMMENDATIONS

General

Based on the findings of our field exploration and our evaluation of the encountered subsurface conditions, it is our opinion that the soils underlying this site are generally satisfactory to support the proposed construction on deep foundations consisting of drilled piers as presently contemplated. Following are our recommendations for site preparation procedures and for the design and construction of the foundation systems.

Please note that pending the load configurations acting upon the appurtenances and the amount of overturning moments and uplift loads; it may be possible to support the structures on shallow foundations. An allowable bearing capacity of 3,000 pounds per square foot may be feasible for such foundations. We remain available for consultations if such foundations need to be considered.

Site Preparation Procedures

The proposed switchyard expansion area should be stripped of all surface vegetation, stumps, debris, organic topsoil or other deleterious materials as encountered. We recommend proof-rolling the cleared surface to locate any unforeseen soft areas or unsuitable surface or near-surface soils, to increase the density of the upper soils, and to prepare the existing surface for the addition of fill soils (as required).

Fill material, if needed, should consist of clean sands, free of organics and other deleterious materials, with less than 12 percent by dry weight passing the U.S. No. 200 sieve and no particle larger than 3 inches in diameter. It should be placed in uniform layers, not exceeding 12 inches in loose thickness, individually compacted with a heavy (10 to 12 ton) vibratory roller so as to produce minimum dry densities of 98 percent of the Modified Proctor (ASTM D-1557) maximum dry density value of the fill material. We understand that the base course to be placed throughout the substation yard will have a thickness of 6 to 8 inches. It can be placed in a single lift, compacted with a heavy vibratory roller to the above specified minimum dry density level.

Foundation Design and Construction Recommendations

We understand that the proposed structures will be supported on a deep foundation system. We have not been provided with any specific information concerning foundation loadings and/or configuration. Following we offer a generalized subsurface profile based on the findings of our subsurface exploration, including our conservative estimate of pertinent engineering parameters of the subsurface materials, for others to use in the design of the proposed deep foundation system.

Table 1: Generalized Profile and Estimated Soils Parameters for the Design of Deep Foundations

Depth (ft)	Description	Unit Weight* γ (lb/ft^3)		Internal Friction Angle ϕ (degrees)	Cohesion C (lb/ft^2)	Lateral Soil Reaction Modulus K_H (lb/in^3)
		Moist	Saturated			
0-13	Very loose to medium dense fine sand with trace rock and shell	105	115	30	0	20
13-28	Very loose to medium dense slightly silty to silty fine sand	105	115	30	0	20
28-50	Loose to medium dense fine sand with varying amounts of shell and partially cemented sand and shell	110	120	33	0	35

* The effective unit weight can be obtained using the following equations:

Above groundwater level: $\gamma_{EFFECTIVE} = \gamma_{MOIST}$

Below groundwater level: $\gamma_{EFFECTIVE} = \gamma_{SATURATED} - \gamma_{WATER}$

Stormwater Pond

Based on the results of the auger borings performed in the existing retention pond area, the near surface fine sand (SP) soils encountered in the upper 4 to 5 feet are considered to be relatively permeable. The underlying very clayey fine sand (SC) and silty fine sand (SM) soils are significantly less permeable and should be considered aquitards with lower permeabilities for retention pond analysis.

For dry bottom ponds, pond performance will be significantly influenced by the soil permeability, the presence of aquitards or confining layers and the vertical separation between the pond bottom and the seasonal high groundwater level. Depending on the final design elevations and staging levels, underdrains may be necessary to prevent growth of aquatic vegetation and for pond volume recovery. An outfall (i.e., stormwater drain, ditch, canal, natural low areas, etc.) will be necessary to utilize underdrains.

Ardaman & Associates, Inc. would be pleased to assist in evaluating the design exfiltration rates, underdrains and/or groundwater baseflow as final pond geometry and stormwater volume requirements become available.

CLOSURE

Our report has been prepared specifically for this project. It is intended for the exclusive use of Florida Power & Light Company and its representatives. Our work has used methods and procedures consistent with local foundation engineering practices. No other warranty, expressed or implied, is made. We do not guarantee project performance in any respect, only that our work meets normal standards of professional care. The recommendations submitted in this report are based on the data obtained from our field exploration and our understanding of the proposed construction as described herein. This report may not account for all the possible variations that may exist between conditions observed in the borings and conditions at locations that were not explored. The nature and extent of any such variations may not become evident until construction is underway. If variations are then observed, we recommend that Ardaman & Associates, Inc. be requested to inspect the actual site conditions and, if necessary, re-evaluate the recommendations of this report.

It has been a pleasure to assist you on this phase of your project. Please contact us whenever we may be of service to you, and please call if you have any questions concerning this report.

Best regards,

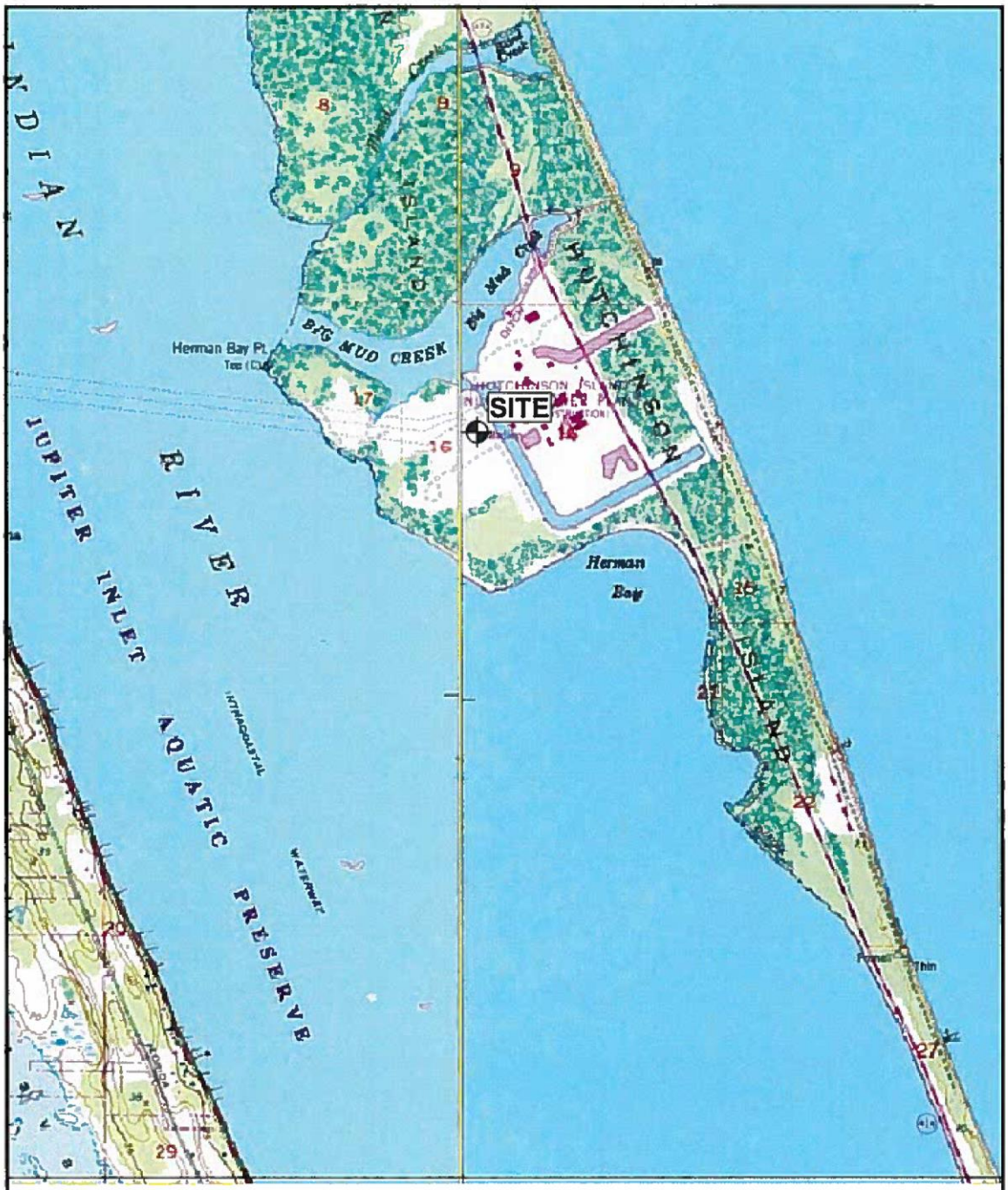
ARDAMAN & ASSOCIATES, INC.
Florida Certificate of Authorization No. 5950



Dan J. Zrallack, P.E.
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Principal Engineer
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Attachments: Figure 1 - Site Vicinity Map
Figure 2 - Boring Location Plan
Subsurface Exploration Information
Soil Boring Logs



SECTION 16
TOWNSHIP 36 SOUTH
RANGE 41 EAST

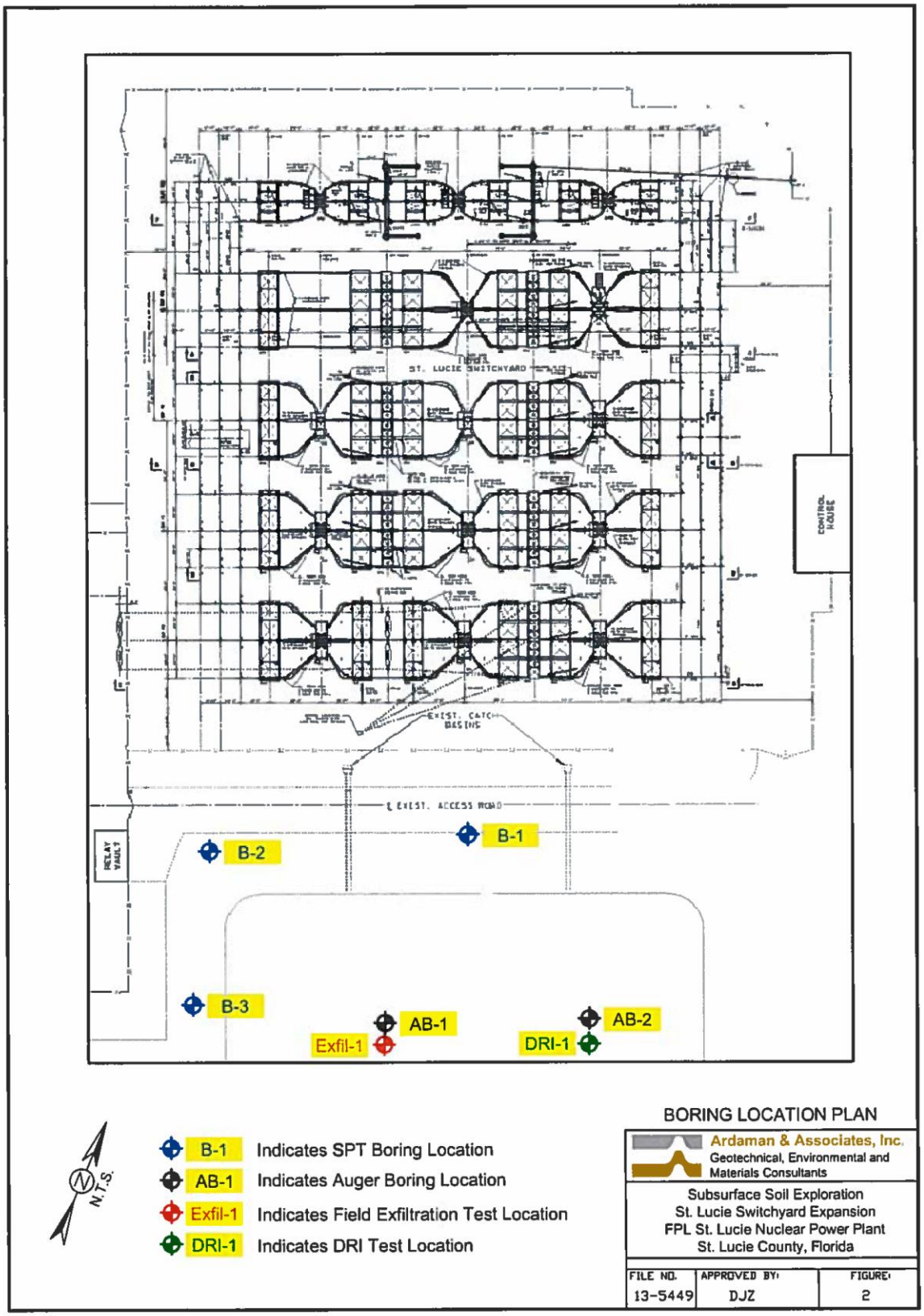
1948 USGS QUADRANGLE MAPS
FORT PIERCE, FLORIDA
EDEN, FLORIDA
(PHOTOREVISED 1983)

SITE LOCATION MAP

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

Subsurface Soil Exploration
St. Lucie Switchyard Expansion
FPL St. Lucie Nuclear Power Plant
St. Lucie County, Florida

FILE NO.	APPROVED BY:	FIGURE:
13-5449	DJZ	1


ST. LUCIE SWITCHYARD
CONTROL HOUSE
EXIST. CATCH BASINS
℄ EXIST. ACCESS ROAD
RELAY VAULT
B-1
B-2
B-3
AB-1
AB-2
Exfil-1
DRI-1
N
N.T.S.
B-1 Indicates SPT Boring Location
AB-1 Indicates Auger Boring Location
Exfil-1 Indicates Field Exfiltration Test Location
DRI-1 Indicates DRI Test Location
BORING LOCATION PLAN
Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants
Subsurface Soil Exploration
St. Lucie Switchyard Expansion
FPL St. Lucie Nuclear Power Plant
St. Lucie County, Florida
FILE NO. 13-5449
APPROVED BY: DJZ
FIGURE: 2

Subsurface Exploration Information

Ardaman & Associates, Inc.

Our 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 no groundwater will be encountered at that boring location.

STANDARD PENETRATION TEST BORINGS

The Standard Penetration Test is a widely accepted method of testing foundation soils in place. The N-Value obtained from the test has been correlated empirically with various soil properties. These empirical correlations allow satisfactory estimates to be made of how the soil is likely to behave when subjected to foundation loads. Tests are usually performed in the boreholes at intervals of five feet. In addition, our Firm performs tests continuously in the interval directly below the expected foundation bearing grade where the soil will be most highly stressed.

Boreholes where Standard Penetration Tests will be performed are drilled with a truck-mounted CME 45 drill rig or a CME 55 drill rig. The boreholes are advanced by rotary drilling with a winged bit that makes a hole about three inches in diameter. A bentonitic drilling mud is recirculated in order to remove the cuttings and support the walls of the borehole. The drag bit is specially modified to direct the mud upward and reduce disturbance of the soil ahead of the bit. If access is not available for our truck-mounted drilling equipment, portable tripod drilling equipment can be used instead.

Occasionally, running or squeezing ground is encountered that cannot be stabilized by the drilling mud alone. In addition, drilling mud may be lost into the soil or rock strata that are unusually pervious. In such cases, flush-coupled steel casing with an outside diameter of about 3.5 inches is driven as a liner for the borehole.

After the borehole has been advanced to the depth where a Standard Penetration Test will be performed, the soil sampler used to run the test is attached to the end of the drill rods and lowered to the bottom of the borehole. The testing procedure used conforms closely to the methods recommended in ASTM D-1586. The sampler used has a split-barrel 24 inches long and an outside diameter of 2.0 inches. It is driven into the ground below the bottom of the borehole using a hammer that weighs 140 pounds and falls 30 inches. The driller records the number of hammer blows needed to advance the sampler in successive increments of six inches. The total number of blows required to advance the sampler the second and third six-inch increments constitutes the test result; that is, the N-value at the depth. The test is completed after the sampler has been

driven not more than 24 inches or when refusal is encountered, whichever occurs first. Refusal occurs when 50 hammer blows advance the sampler six inches or less. After the test is completed, the sampler is removed from the borehole and opened.

The driller examines and classifies the soil recovered by the sampler. He places representative soil specimens from each test in closed glass jars or plastic bags and takes them to our laboratory. In the laboratory, additional evaluations and tests are performed, if needed. The driller's classifications may be adjusted, if necessary, to conform more closely with the Unified Soil Classification System (USCS). Jar samples are retained in our laboratory for thirty days, then discarded unless our clients request otherwise.

After completion of a test boring, the water level in the borehole is recorded.

SOLID-STEM AUGER BORINGS

Solid-stem auger borings are used when a relatively large, continuous sampling of soil strata close to the ground surface is desired. The testing procedure used conforms closely to the methods recommended in ASTM D-1452. A 4-inch diameter continuous flight, helical auger with a cutting head at its end is screwed into the ground in 5 foot sections. It is powered by the rotary drill rig. The samples are recovered by withdrawing the auger out of the ground without rotating it. The soil samples so obtained, are described and representative samples put in jars or bags and returned to the laboratory for further classification and testing, if necessary.

ENGINEERING CLASSIFICATION OF SOILS

The following tables relate N-values to a qualitative description of the relative soil density.

	Description	N
Cohesionless Soils	Very loose	0-4
	Loose	5-9
	Medium dense	10-29
	Dense	30-49
	Very dense	50+

	Description	N
Cohesive Soils	Very soft	0-2
	Soft	3-4
	Medium stiff	5-8
	Stiff	9-15
	Very stiff	16-30
	Hard	31+

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STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: FPL St. Lucie Switchyard Expansion — FILE No.: t3-5449

BORING LOCATION: See Boring Location Plan — DRILL CREW: WPB

WATER OBSERVED AT DEPTH 8.1 Feet — DATE DRILLED: 9/25/13

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE
0	6/6 8/6 7/6	Brown Fine Sand (SP) with Trace Rock and Shell	1	
5	10/6 9/6 9/6	Brown Fine Sand (SP)	2 3	14 18
10	7/6 5/6 6/6		4	11
15	3/6 4/6 4/6	Greenish Gray Slightly Silty Fine Sand (SP-SM)	5	8
20	13/6 21/6 30/6	Greenish Gray Silty Fine Sand (SM) with Some Cemented Sand and Shell <Natural Moisture: 15.8%> <Percent Fines: 23.4%>	6	51
25	7/6 2/6 2/6	Greenish Gray Slightly Silty Fine Sand (SP-SM) with Trace Shell <Natural Moisture: 38.8%> <Percent Fines: 11.2%>	7	4
30	3/6 3/6 3/6	Gray Fine Sand (SP) with Some Shell	8	6
35	9/6 10/6 13/6		9	23

N VALUE: 5 10 15 20 25 30 35 40 45

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

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STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: FPL St. Lucie Switchyard Expansion — FILE No.: 13-5449

BORING LOCATION: See Boring Location Plan — DRILL CREW: WPB

WATER OBSERVED AT DEPTH 8.1 Feet — DATE DRILLED: 9/25/13

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
35					
40	9/6 13/6 14/6	Greenish Gray Slightly Silty Fine Sand (SP-SM) with Some Partially Cemented Sand and Shell	10	27	
45	8/6 9/6 9/6	Greenish Gray Slightly Fine Sand (SP-SM)	11	18	
50	9/6 10/6 9/6	Greenish Gray Fine Sand (SP) with Some Partially Cemented Sand and Shell	12	19	
55		End of Boring			
60					
65					
70					

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN". 140-LB HAMMER. 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-2

PROJECT: FPL St. Lucie Switchyard Expansion — FILE No.: 13-5449

BORING LOCATION: See Boring Location Plan — DRILL CREW: WPB

WATER OBSERVED AT DEPTH 8.0 Feet — DATE DRILLED: 9/25/13

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
0		Brown Fine Sand (SP) with Trace Rock and Shell	1		
5	1/6 1/6 1/6		2	2	
	1/6 2/6 2/6		3	4	
10	1/6 2/6 2/6		4	4	
15	5/6 10/6 13/6	Greenish Gray Silty Fine Sand (SM) with Some Partially Cemented Sand and Shell <Natural Moisture: 15.0%> <Percent Fines: 17.2%>	5	23	
20	6/6 4/6 5/6	Grayish Brown Slightly Silty Fine Sand (SP-SM) with Trace Shell <Natural Moisture: 35.6%> <Percent Fines: 11.8%>	6	9	
25	8/6 11/6 12/6	Gray Fine Sand (SP) with Some Shell	7	23	
30	9/6 10/6 13/6		8	23	
35	5/6 7/6 8/6		9	15	

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

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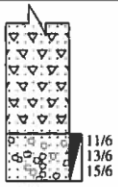
STANDARD PENETRATION TEST BORING LOG

BORING B-2

PROJECT: FPL St. Lucie Switchyard Expansion — FILE No.: 13-5449

BORING LOCATION: See Boring Location Plan — DRILL CREW: WPB

WATER OBSERVED AT DEPTH 8.0 Feet — DATE DRILLED: 9/25/13

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
35	 11/6 13/6 15/6	Gray Fine Sand (SP) with Some Partially Cemented Sand and Shell	10	28	
40		End of Boring			
45					
50					
55					
60					
65					
70					

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN", 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

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STANDARD PENETRATION TEST BORING LOG

BORING B-3

PROJECT: FPL St. Lucie Switchyard Expansion — FILE No.: 13-5449

BORING LOCATION: See Boring Location Plan — DRILL CREW: WPB

WATER OBSERVED AT DEPTH 6.5 Feet — DATE DRILLED: 9/25/13

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
0		Brown Fine Sand (SP) with Trace Rock and Shell	1		
5	2/6, 6/6, 6/6		2	12	
	7/6, 10/6, 11/6		3	21	
10	7/6, 9/6, 5/6		4	14	
15	6/6, 8/6, 9/6	Greenish Gray to Grayish Brown Slightly Silty Fine Sand (SP-SM)	5	17	
20	1/6, 0/6, 1/6	Greenish Gray Silty Fine Sand (SM)	6	1	
25	1/6, 1/6, 1/6	Greenish Gray Slightly Silty Fine Sand (SP-SM) with Trace Shell	7	2	
30	8/6, 12/6, 14/6	Gray Fine Sand (SP) with Some Shell	8	26	
35	11/6, 11/6, 12/6	Greenish Gray Slightly Silty Fine Sand (SP-SM) with Trace Shell	9	23	

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

Ardaman & Associates, Inc.

STANDARD PENETRATION TEST BORING LOG

BORING B-3

PROJECT: FPL St. Lucie Switchyard Expansion — FILE No.: 13-5449

BORING LOCATION: See Boring Location Plan — DRILL CREW: WPB

WATER OBSERVED AT DEPTH 6.5 Feet — DATE DRILLED: 9/25/13

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE	N VALUE
35	9/6 10/6 13/6		10	23	
40	3/6 3/6 3/6	Greenish Gray Fine Sand (SP) with Some Partially Cemented Sand and Shell	11	6	
45	3/6 3/6 4/6		12	7	
50		End of Boring			
55					
60					
65					
70					

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN". 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

Ardaman & Associates, Inc.

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING AB-1

PROJECT: FPL St. Lucie Switchyard Expansion

FILE No.: 13-5449

BORING LOCATION: See Boring Location Plan

DRILL CREW: WPB

WATER OBSERVED AT DEPTH 6.8 Feet

DATE DRILLED: 9/25/13

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Brown Fine Sand (SP) with Trace Rock and Shell	1
		Greenish Gray Very Clayey Fine Sand (SC)	2
5		Greenish Gray Silty Fine Sand (SM) <Natural Moisture: 30.7%> <Percent Fines: 30.2%>	3
		Greenish Gray Silty Fine Sand (SM) <Natural Moisture: 34.6%> <Percent Fines: 49.9%>	4
10		End of Boring	
15			

NOTES:

Ardaman & Associates, Inc.

Ardaman & Associates, Inc.

AUGER BORING LOG

BORING AB-2

PROJECT: FPL St. Lucie Switchyard Expansion

FILE No.: 13-5449

BORING LOCATION: See Boring Location Plan

DRILL CREW: WPB

WATER OBSERVED AT DEPTH 6.5 Feet

DATE DRILLED: 9/25/13

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Brown Fine Sand (SP) with Trace Rock and Shell	1
5		Greenish Gray Very Clayey Fine Sand (SC)	2
		Brown Silty Fine Sand (SM)	3
		Brown Slightly Silty Fine Sand (SP-SM)	4
10		End of Boring	
15			

NOTES:

Ardaman & Associates, Inc.

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SFWMD USUAL OPEN-HOLE TEST
Exfil-1

PROJECT: FPL St. Lucie Switchyard Expansion

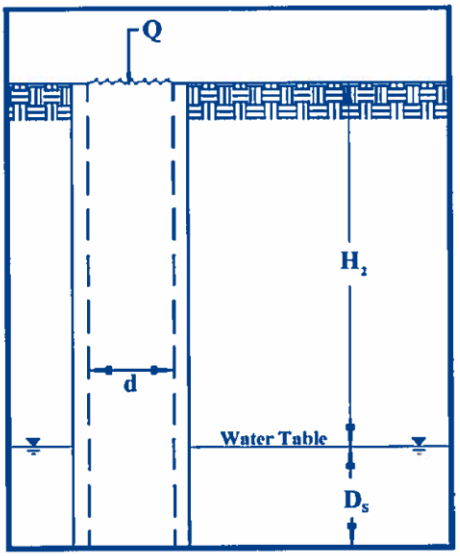
FILE No.: 13-5449

TEST LOCATION: See Boring Location Plan

DRILL CREW: WC/TC

GROUNDWATER OBSERVED AT DEPTH 6.8 Feet

TEST DATE: 9/27/13



$$K = \frac{4Q}{\pi d(2H_2^2 + 4H_2D_s + H_2d)}$$

Q ["Stabilized" Flow Rate (cfs)] = 2.7 x 10^{-3}

K [Hydraulic Conductivity (cfs/sqf - ft head)] = 1.5 x 10^{-4}

d [Diameter of Test Hole (ft)] = 0.5

H_2 [Depth to Water Table (ft)] = 6.8

* D_s [Saturated Hole Depth (ft)] = -1.8

* By Groundwater

DEPTH	SYMBOLS	SOIL DESCRIPTION	SAMPLE No.
0		Brown Fine Sand (SP) with Trace Rock and Shell	1
1			
2			
3			
4			
5		End of Boring	
6			

NOTES:

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DOUBLE-RING INFILTRATION (DRI) TEST
(ASTM D 3385)

Project Name: FPL St. Lucie Switchyard Expansion **File Number:** 13-5449

Test ID: DRI-1 **Test Date:** 9/27/2013

Location: Existing Dry Retention Pond, Eastern Portion (AB-2) **Field Crew:** WC/TC

INFILTROMETER SET UP INFORMATION:

Inner Ring Diameter (in): 12 **Inner Ring Area [A_{IR}] (in^2):** 113.1

Outer Ring Diameter (in): 24 **Annular Space Area [A_A] (in^2):** 339.3

Inner Ring Height (in): 20 **Inner Ring Embedment Depth (in):** 9

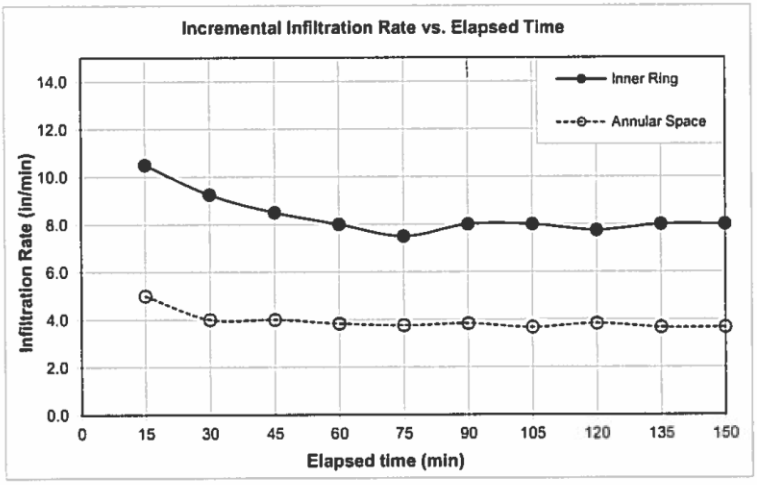
Outer Ring Height (in): 20 **Outer Ring Embedment Depth (in):** 6

Test Surface Depth (in bis): 0 **Depth of Water Inside Rings (in):** 6

Surficial Soil Description: brown fine sand (SP) with trace rock and shell

TEST DATA

Trial No.	Elapsed Time (min)	Δt (hr)	ΔV_{IR} (in^3)	ΔV_A (in^3)	V_{IR} (in/hr)	V_A (in/hr)
1	15	0.25	296.8	424.1	10.50	5.00
2	30	0.25	261.5	339.2	9.25	4.00
3	45	0.25	240.3	339.2	8.50	4.00
4	60	0.25	226.2	325.1	8.00	3.83
5	75	0.25	212.0	318.0	7.50	3.75
6	90	0.25	226.2	325.1	8.00	3.83
7	105	0.25	226.2	311.0	8.00	3.67
8	120	0.25	219.1	325.1	7.75	3.83
9	135	0.25	226.2	311.0	8.00	3.67
10	150	0.25	226.2	311.0	8.00	3.67



SOIL INFILTRATION RATE = 8 in/hr