

John E. Manning
District One

Cecil L. Pendergrass
District Two

Larry Kiker
District Three

Brian Hamman
District Four

Frank Mann
District Five

Roger Desjarlais
County Manager

Richard Wesch
County Attorney

Donna Marie Collins
County Hearing Examiner

July 3, 2019

Cindy Mulkey, Administrator
Power Plant Siting Office
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

RE: Lee County Solid Waste Energy Recovery Facility, DEP Case No. PA-90-30 Notice of Proposed Amendment to Power Plant Site Application

Dear Ms. Mulkey:

Lee County Division of Solid Waste is proposing an amendment to its Power Plant Site Application in order to construct and utilize five enhancements needed to support the existing Solid Waste to Energy Recovery Facility (SWERF) site. A general site plan showing the location of each of the improvements is provided in Attachment 1.

Additional information about the proposed site enhancements will be submitted to the DEP's South District Office as design of facilities advances and prior to construction of proposed modifications. All proposed construction activities will be subject to the Conditions of Certification applicable to this site.

The enhancements are listed below and a brief description follows. Attachment 2 includes the conceptual drawings associated with each:

- 1) SWERF Operator Maintenance Storage Shed
- 2) SWERF Operator Spare Parts Storage Warehouse
- 3) Lee County Solid Waste (LCSW) Fleet Maintenance Storage Building
- 4) Entrance Road Turn-Around
- 5) Transfer Station Employee Building

1) The SWERF operator maintenance storage shed is necessary to provide adequate boiler maintenance material storage capacity. This site enhancement will provide the necessary cover and protection to materials that are critical for maintaining the boilers. The footprint of this modification is approximately 0.04 acres and will be constructed on existing disturbed area.

2) The SWERF operator spare parts storage warehouse is necessary to provide a dedicated common storage area for the spare parts that are critical to minimize downtime of the SWERF and long lead time replacements. The footprint of this

modification is approximately 0.03 acres and will be constructed on existing disturbed area.

3) The existing Fleet Maintenance Facility is an ancillary facility to the Resource Recovery Facility operation. Lee County maintains its own fleet of trucks and off-road equipment for operating its integrated solid waste management system. The Fleet Maintenance facilities are dedicated to solid waste and ash transfer vehicle maintenance, as well as front end loaders, fork lifts, grapple trucks, etc. The existing Fleet Maintenance Building consists of four (4) maintenance bays, two (2) service lifts (for small vehicles and heavy vehicles), parts storage and inventory, office areas and mechanic facilities.

The proposed LCSW Fleet Maintenance Storage Building is necessary to provide additional storage for spare parts and supplies required to maintain the fleet. The new building will also include two (2) additional offices for maintenance staff. The proposed addition is approximately 0.27 acres and will be constructed on existing disturbed area. Stormwater will be routed to the existing management system by minor swales and ditches per the site plan in Attachment 3.

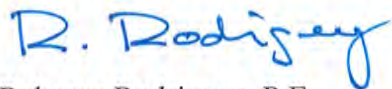
4) The Entrance Road Turn-Around is necessary to provide improved traffic flow and increased security for the SWERF Site. Currently when guests to the SWERF site approach the scale, they are required to identify themselves to the Scale House Attendant who grants access and opens a swing arm security gate. If the guest is not permitted access to the site, or has arrived at the site in error, the only way for them to turn around and leave the site is to open the security gate and have them enter the site, and then perform a U-turn to the scale bypass exit lane. The proposed short one-way roadway would connect the existing parking area adjacent to the scale house to existing roadway prior to the scales which would allow the mis-directed vehicle to enter the exit roadway without having to open the gate. The footprint of this modification is approximately 0.07 acres over existing grassed area.

5) The Transfer Station provides the ability to transfer solid waste collected by smaller collection vehicles to larger transfer trailers for efficient off-site disposal. This occurs during peak times when there is more solid waste incoming than can be processed/stored at the SWERF. Continued population growth has led to increases in municipal solid waste collections County-wide, resulting in more transfer operations staff. The Transfer Station Employee Building is necessary to provide a larger Locker Room and a Conference Room and Break Area/Kitchen for staff. The existing Locker Room is at capacity, and the existing Break Room/Kitchen doubles as a Conference Room. The footprint of this modification is approximately 0.13 acres in existing vegetated area.

Stormwater impacts associated with the proposed projects and impervious additions to the site stormwater management system have been evaluated by our Consultant, HDR, and have been shown to be accommodated within the existing site storage volumes; post-construction off-site discharge will be no greater than pre-construction conditions. An Environmental Assessment was performed and is provided in Attachment 4; no impacts to wetlands or listed species is anticipated for any of the projects. Any construction activities or impacts of the proposed projects on existing basins, conveyances or retention capabilities will be addressed with the associated construction submittals prior to construction. Supporting documentation for the proposed Amendment is provided in the Attachments.

If you have any questions or need any additional information, please call me at (239) 533-8914

Sincerely,



Rebecca Rodriguez, P.E.,
Public Utilities Operations Manager
Lee County Public Utilities – Solid Waste Division

w/Attachments

cc: Pam Keyes, Lee County Public Utilities
Jason Fournier, Lee County Public Utilities
Laura Gray, Lee County Public Utilities
Nolin Moon, FDEP South District
Don Castro, HDR

Lee County Solid Waste Energy Recovery Facility

DEP Case No. PA-90-30

Attachments to Application for Amendment to Power Plant Site Application

July 1, 2019

The following attachments are prepared by HDR Engineering, Inc. in support of Lee County's proposed Amendment to the Solid Waste Energy Recovery Facility for minor site improvements.

Attachment 1: Basin Delineation and Site Plan

Attachment 2: Conceptual Plans¹ for Proposed Improvement Projects Numbered 1 through 5.

Attachment 3: Fleet Maintenance Building Site Plan

Attachment 4: Environmental Resource Permit Forms²

Attachment A: Stormwater Calculations

Attachment B: Stage Storage Curve – Basins 2, 4, and 6

Attachment C: Historic Calculations

Attachment D: Water Storage

Attachment E: Basin Map

Attachment F: ICPR Inputs and Results

¹ All relevant construction plans will be submitted to DEP prior to implementation of any of these projects.

² ERP Forms are used only for formatting information as requested by DEP; Lee County is not requesting or submitting an official ERP Permit application herewith, and the ERP forms are submitted in the context of supporting information for the Power Plant Siting application review only.

ATTACHMENT 1

HDR

HDR Engineering, Inc.
5435 BayCenter Dr, Ste. 400
Tampa, FL 33609-3444
(813) 282-2200
CA00004213

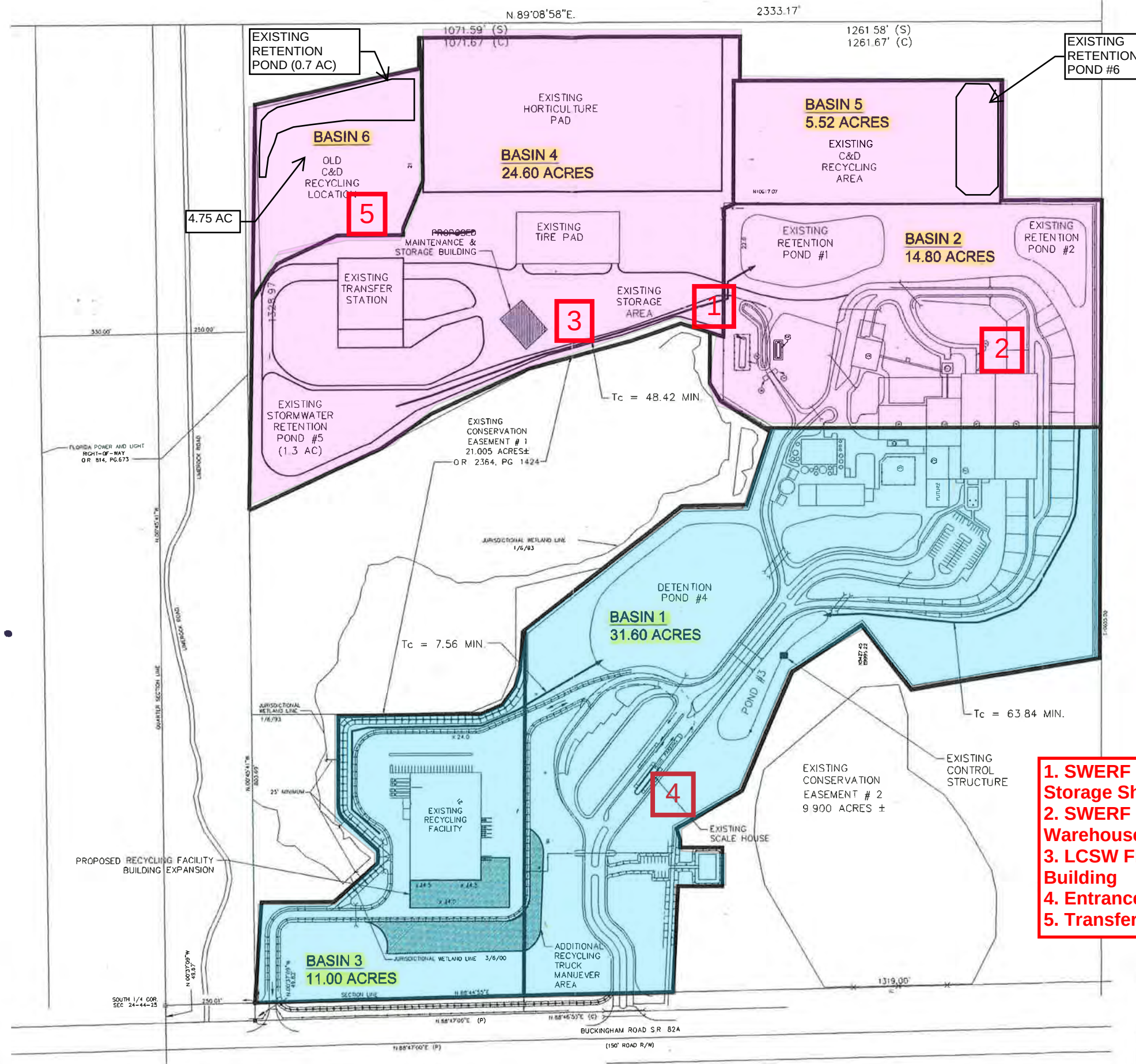


FIGURE 6
Basin Delineation / Site Plan
Lee County Solid Waste Energy Recovery Facility (SWERF)

ATTACHMENT 2

SWERF Operator Maintenance Storage Shed

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF
VERSATUBE BUILDING SYSTEMS. ANY REPRODUCTION IN PART OR WHOLE WITHOUT
THE WRITTEN PERMISSION OF VERSATUBE BUILDING SYSTEMS IS PROHIBITED.

SHEET METAL PANELS NOT SHOWN

TYPE 9 TRUSS BRACE
FOR 30'W STRUCTURES,
13 PLACES

NEW 18"x18"
STRIP FOOTING

EXISTING
STRIP FOOTING

BK-BPR-24
BASE POST
REINFORCEMENTS
4 PER POST,
8 PER FRAME,
10 SCREWS PER BK-BPR-24,
13 LOCATIONS

EXISTING
STRIP FOOTING

30' X 16' FRAME
14 PLACES

BEC03016-7V_171132 REV
BACK ENCLOSURE

NEW 18"x18"
STRIP FOOTING

DESIGN CRITERIA:

STRUCTURE SIZE: 30' X 50'-2" X 16'
ON CENTER SPACING: 4' & 2'
SHEET METAL: 26GA, R-PANEL, 60KSI, STEEL
RISK CATEGORY: II
OCCUPANCY GROUP: U-1

WIND LOAD: VULT 170MPH, V35, EXPOSURE (C)
WIND IMPORTANCE FACTOR: 1
ROOF LIVE LOAD: 20PSF
GROUND SNOW LOAD: 0PSF
SEISMIC CATEGORY: A

CODE COMPLIANCE: FLORIDA BUILDING CODE, 5TH EDITION (2014)

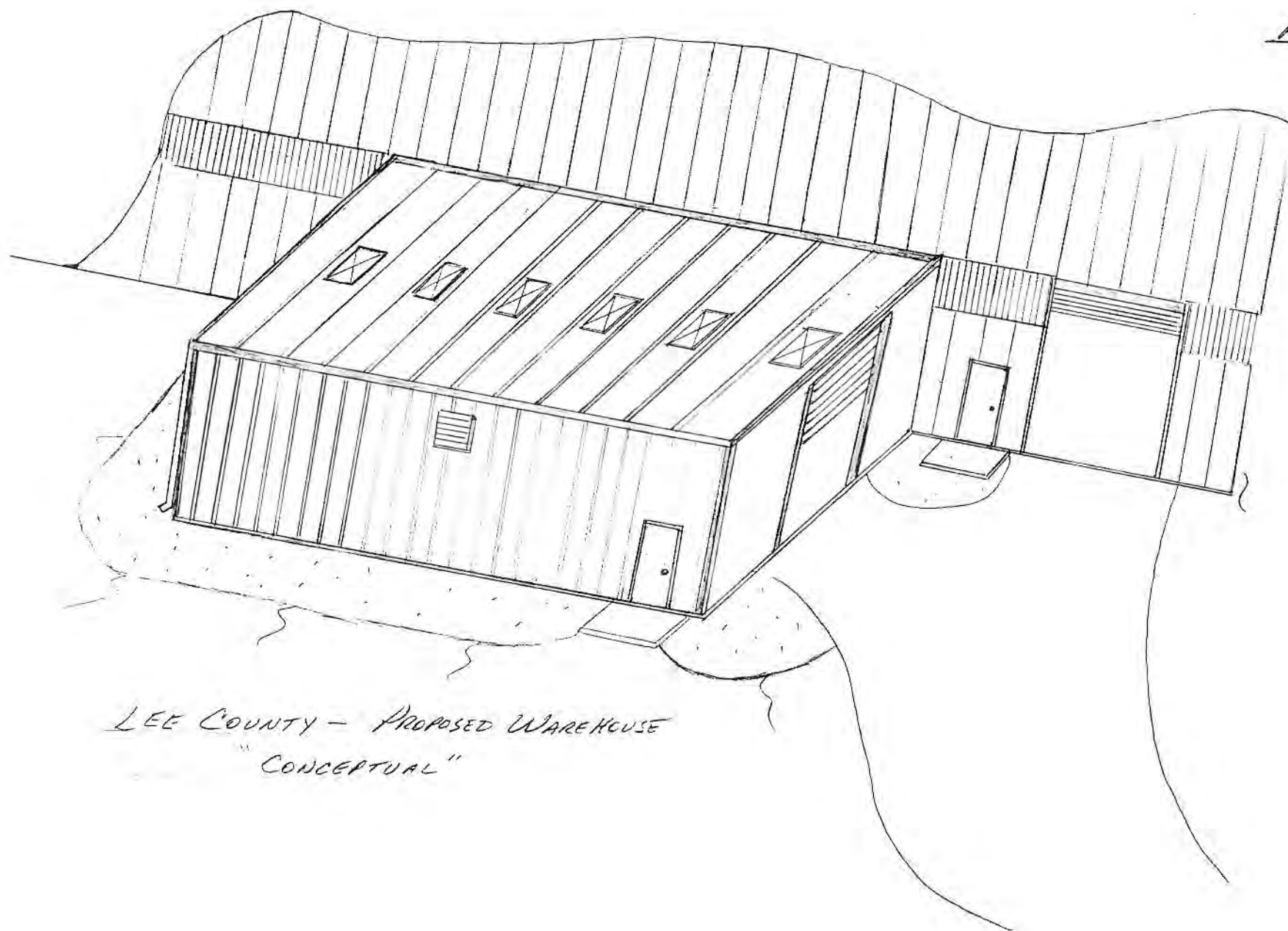
NOTE TO BUILDING DEPARTMENT OFFICIAL:
THESE DRAWINGS AND/OR CALCULATIONS ARE VALID ONLY FOR
STRUCTURES MANUFACTURED BY VERSATUBE BUILDING SYSTEMS.
VERIFICATION IS RECOMMENDED PRIOR TO BUILDING APPROVAL.

© VERSATUBE BUILDING SYSTEMS 2017

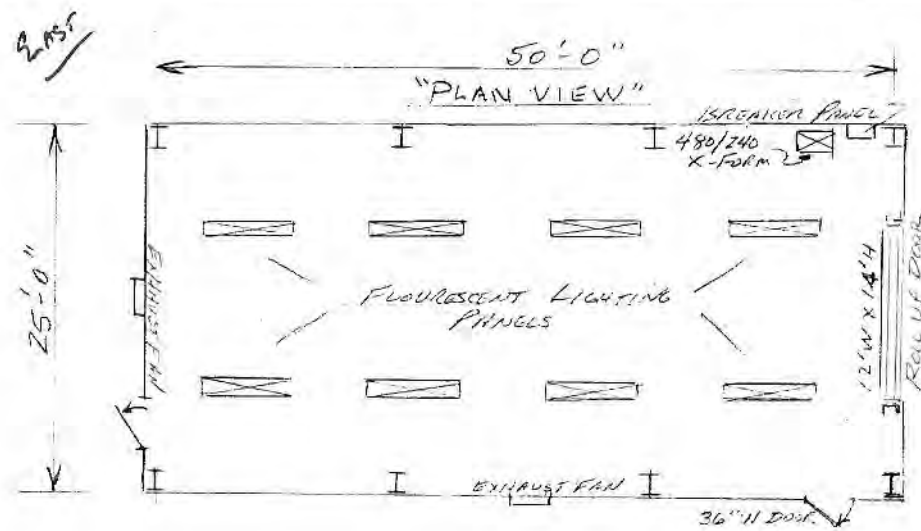
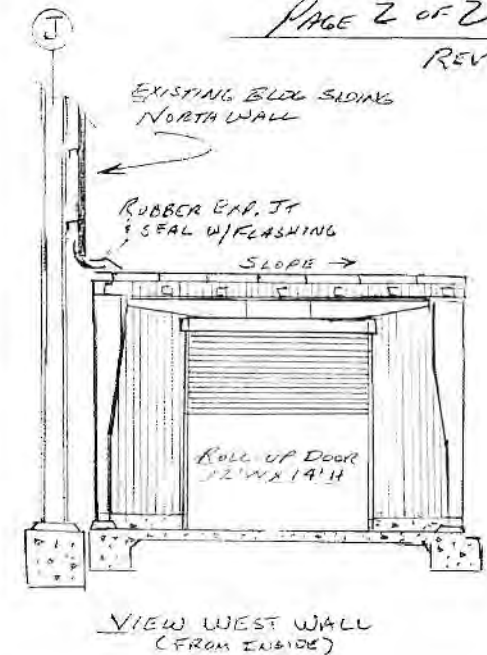
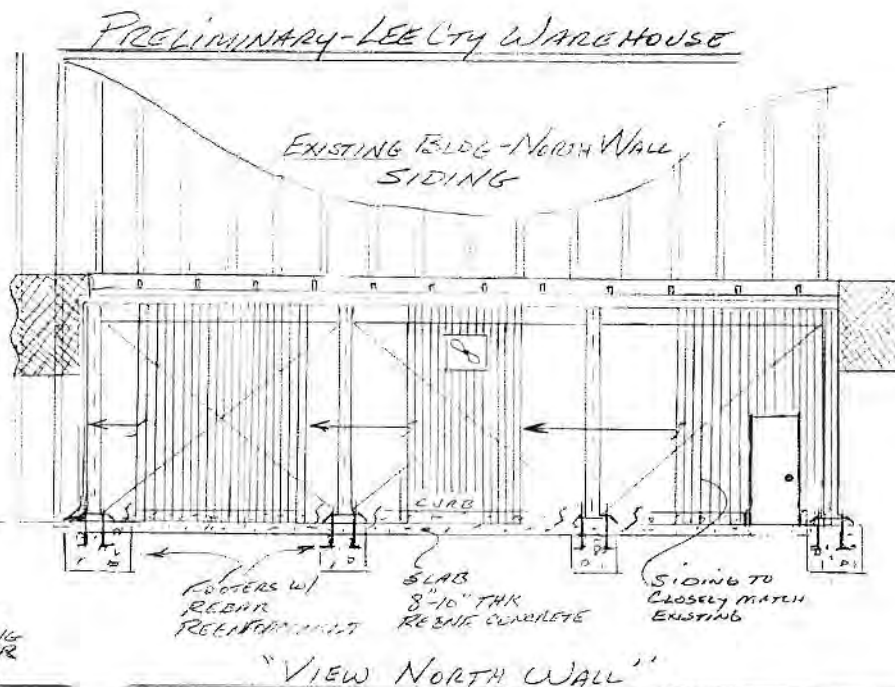
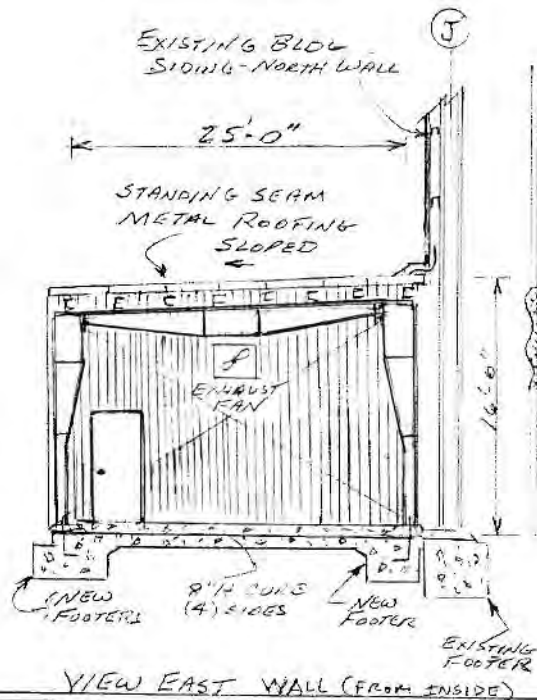


PROJECT: TODD SHERIDAN
1500 BUCKINGHAM ROAD, FORT MYERS, FL 33905
TITLE: 30'X50'-2"X16' 3-SIDED CLASSIC, TYPE 9 TRUSS BRACE, 1.5'SQ. WEBS,
2"X140" KNEE BRACES, BK-BPR-48, BASE POST REINFORCEMENTS
DWG NO: C3EC93050160402R_171132 REV P1
DRAWN BY: R. HUTCHINS
DATE: 12/4/2017

SWERF Operator Spare Parts Storage Warehouse



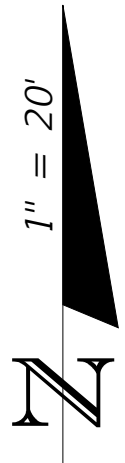
LEE COUNTY - PROPOSED WAREHOUSE
"CONCEPTUAL"



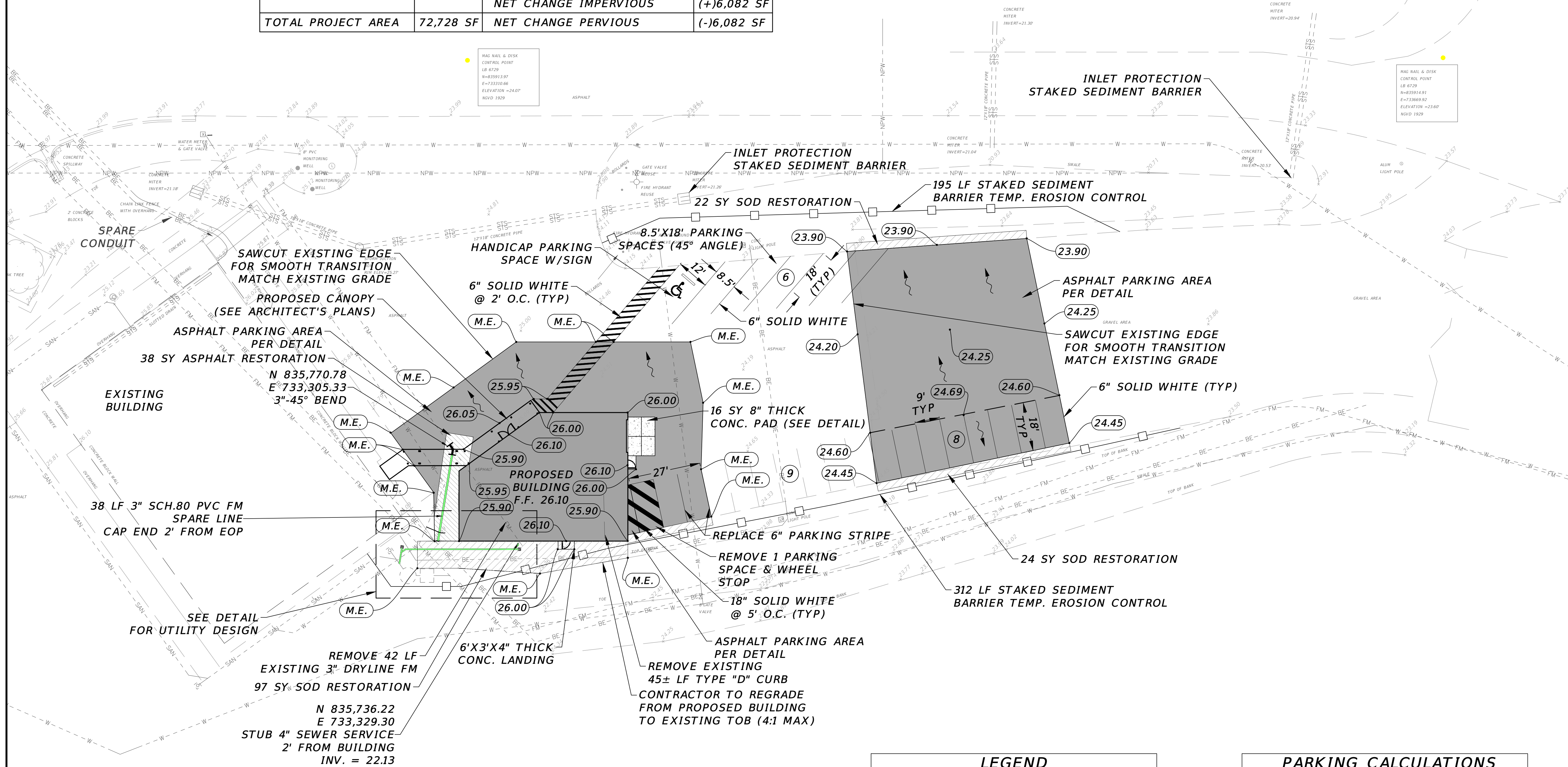
- NOTES**
- 1) FREE STANDING PRE-ENG. BLDG WITH RIBBED SIDING ON (3) SIDES
 - 2) BUILDING TO MEET COVANTA SPEC SS506
 - 3) BUILDING ABUTS EXISTING NORTH WALL OF MAINT. SHOP, PROVIDE OPENING IN EXISTING SIDING FOR DOUBLE DOOR ACCESS INTO NEW BLDG.
 - 4) FOOTER & SLAB DESIGN BY FLA/PE
 - 5) FOOTER TO INTEGRATE W/ EXISTING AL IF REQUIRED
 - 6) EXIST. FIRE PROT. SPRINKLER SYSTEM TO BE REQUIRED
 - 7) COVANTA TO PROVIDE POWER CONNECTION AND INCLUDE 480V/240V X-FORMER
 - 8) DESIGN TO INCLUDE GUTTERS AND DOWNSPOUT

MODULAR INSULATED

LCSW Fleet Maintenance Storage Building



SITE CALCULATIONS			
EXISTING PAVEMENT	23,784 SF	POST-CONS. PAVEMENT	27,070 SF
EXISTING BUILDING	9,225 SF	POST-CONS. BUILDING	11,845 SF
EXISTING CONCRETE	3,960 SF	POST-CONS. CONCRETE	4,136 SF
TOTAL IMPERVIOUS	36,969 SF	POST-CONS. TOTAL IMPERVIOUS	43,051 SF
EXISTING OPEN SPACE	21,012 SF	POST-CONS. OPEN SPACE	20,931 SF
EXISTING GRAVEL	14,747 SF	POST-CONS. GRAVEL	8,746 SF
TOTAL PERVIOUS	35,759 SF	POST-CONS. TOTAL PERVIOUS	29,677 SF
		NET CHANGE IMPERVIOUS	(+)6,082 SF
TOTAL PROJECT AREA	72,728 SF	NET CHANGE PERVIOUS	(-)6,082 SF



LEGEND	
ASPHALT	
CONCRETE	
SOD	
ASPHALT RESTORATION	
M.E.	MATCH EXISTING

PARKING CALCULATIONS	
EXISTING PARKING SPACES	17 SPACES
PARKING SPACES REMOVED	8 SPACES
EXISTING PARKING TO REMAIN	9 SPACES
PROPOSED PARKING SPACES	14 SPACES
TOTAL PARKING PROVIDED	23 SPACES
HANDICAP PARKING	1 SPACE



DAVID DOUGLAS ASSOCIATES, INC.

1821 Victoria Avenue
Fort Myers, Florida 33901
Ph. 305-517-6469
Website: www.ddai-engineers.com
Certification of Authorization # 7568

Project Name:

LEE COUNTY
FLEET BUILDING
MODIFICATIONS

Project Address:

10500 BUCKINGHAM ROAD
FORT MYERS, FL 33905

Client/Owner:

LEE COUNTY
PO BOX 398
FORT MYERS, FL 33902

Engineer Contact:

Daniel Craig, P.E.
Project Manager
Phone: 239-337-3330
Email: dc@ddai-engineers.com
Project Engineer:

George R. Brinson, Jr.
FLA. REG. P.E. NO. 47607
NOT VALID WITHOUT THE SIGNATURE, DATE
AND THE ORIGINAL SEAL OF A FLORIDA
PROFESSIONAL ENGINEER

Legal Disclaimer:

THIS DOCUMENT, THE IDEAS AND DESIGNS
INCORPORATED HEREIN IS AN INSTRUMENT OF
PROFESSIONAL SERVICE, AND IS NOT TO BE USED
IN WHOLE OR IN PART FOR ANY OTHER PROJECT
WITHOUT THE WRITTEN AUTHORIZATION OF DAVID
DOUGLAS ASSOCIATES, INC. © 2010

Revisions:

SITE DATA:

STRAP # 24-44-25-00-00001.0000
SEC-TWP-RGE SEC 24 TWP 44S RGE 25E
PROJECT MGR: DANIEL CRAIG, P.E.
PROJECT # 18-0031
FILE NAME 06-18-0031-PLAN.DWG
ORIGIN DATE 09-20-18
DESIGNER DC
CADD JP
CHECKED BY GB
PLOT DATE WED 2-13-2019 3:46 PM
PLOTTED BY JASON PANICARO
SHEET TITLE:

SITE PLAN

SHEET NO. 06

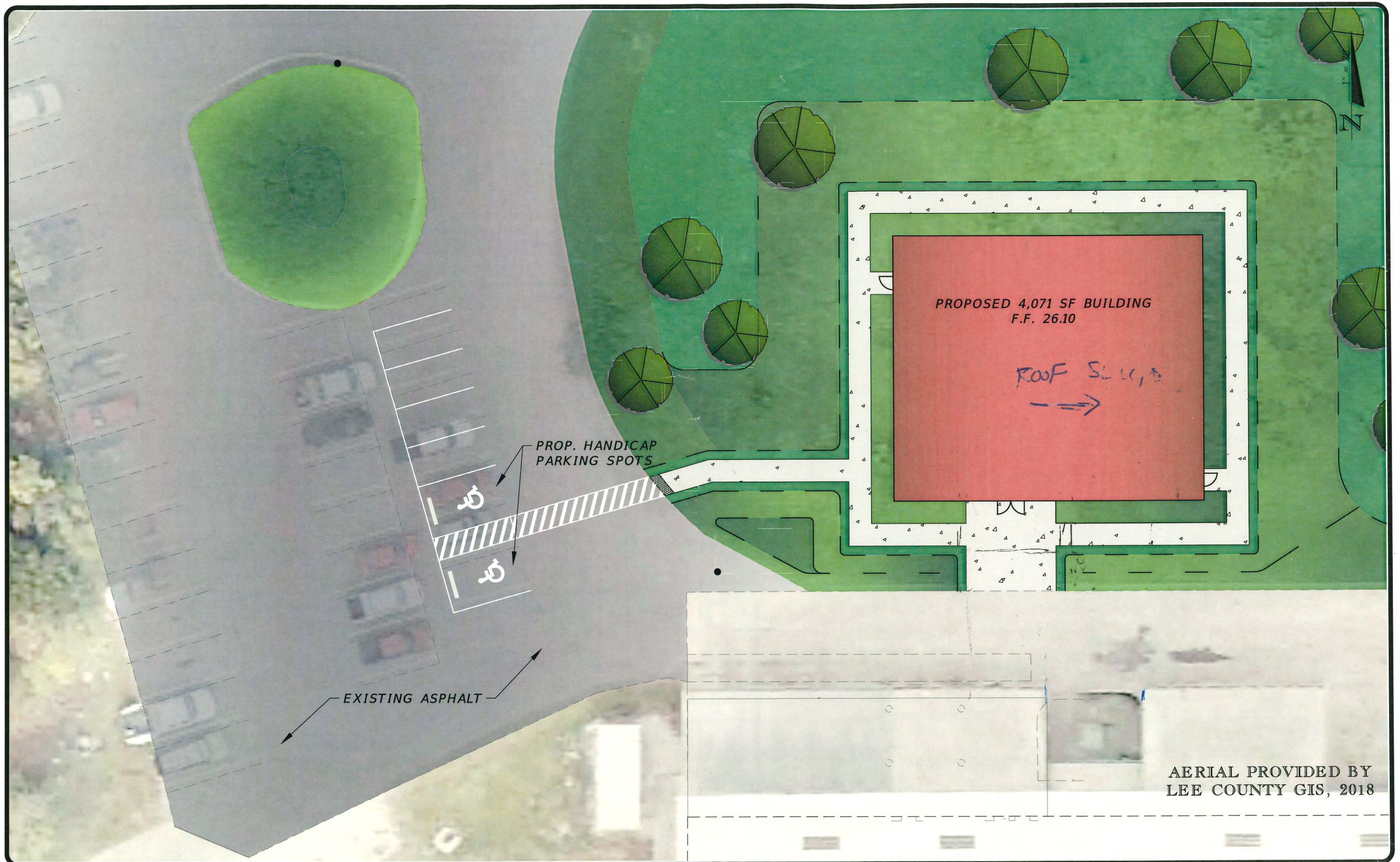
FINAL PLANS FOR
BIDDING & CONSTRUCTION

Entrance Road Turn-Around



Area=2850 SF

Transfer Station Employee Building



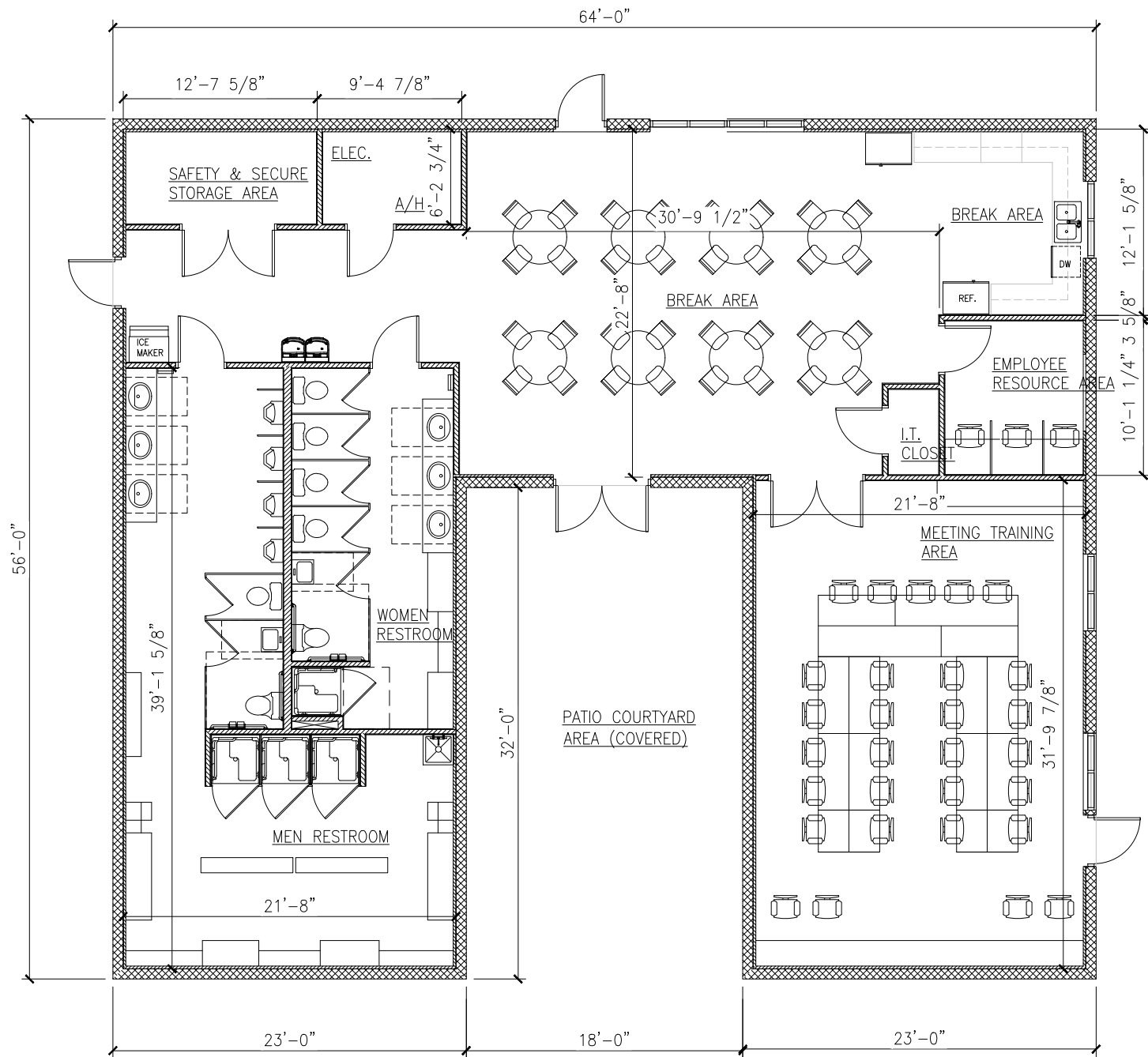
CONCEPT A

JOB #18-0129

DDAI
DAVID DOUGLAS ASSOCIATES, INC.
1821 Victoria Ave., Suite 1, Fort Myers, FL 33901 Ph. (239) 337-3330

LEE COUNTY SOLID WASTE EMPLOYEE BUILDING

DATE: 03-19-19



LEE COUNTY FLEET EMPLOYEE BUILDING

BUILDING SQUARE FOOTAGE: 3008 SF

COURTYARD SQUARE FOOTAGE: 576 SF

GROSS ROOF AREA: 3584 SF

ATTACHMENT 3

ATTACHMENT 4

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 Handbooks 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
Fill in wetlands or waters for a single family residence?	Y	Y	N	N	N	N	N	N
Docks, shoreline stabilization, seawalls associated with a single family residence?	Y	Y	N	N	N	Y, as needed	N	N
Wetland impacts (other than association with an individual residence)?	Y	N	Y	N	N	N	N	N
Boating facilities, a marina, jetty, reef, or dredging?	Y	N	Y	Y	N	Y, as needed	N	N
Any work on state owned submerged land?	Y	N	Y	N	N	Y	N	N
Construction of a stormwater management system?	Y	N	Y, as needed	N	Y	N	N	N
Constructing a mitigation bank?	Y	N	Y	N	Y, as needed	N	Y	N
Creating a mine?	Y	N	Y, as needed	N	N	N	N	Y

Note- if you are required to provide Section B, then you do not have to provide any other Sections, unless the activities are on state-owned submerged lands. In that case, Section F will also be required.

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:

Lee County Solid Waste Energy Recovery Facility

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: **DEP-PA-90-30**
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: **DEP-PA-90-30**
- ☐ Abandonment or removal of works, activities, and/ or a stormwater management system.
Provide existing DEP or WMD permit #, if known: **DEP-PA-90-30**
- ☐ 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: **DEP-PA-90-30**

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:

Miscellaneous site improvement projects unrelated to solid waste processing systems.

E. Project/Activity Street/Road Address or other location (if applicable): Buckingham Road (SR 82A)
City: Fort Myers County(ies): Lee County Zip: 33905

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): 24 Township: 44S Range: 25E Land Grant name, if applicable:

Section(s): 24 Township: 44S Range: 25E

1. Section(s): 24 Township: 44S Range: 25E

- G. Latitude (DMS) 26 ° 37 ' 58 " Longitude (DMS) 81 ° 45 ' 50 " (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):

ArcMap 10.6.1 GIS

- H. Tax Parcel Identification Number(s): 412632200003, 412633300002, and 422604300003

[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):
I-75 to SR82. Head east to Buckingham Road. Turn left. The facility is on the left before Buckingham Community Park

- J. Project area or phase area: 0.395 acres

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

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):

34.32 acres or square feet

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

Normal Pool: 10.46 acre-feet. Depth 1 ft.
Maximum Pool: acre-feet. Depth ft.

Part 2: Supplemental Information, and Permit History

- A. Is this an application to modify an existing Environmental Resource Permit or to construct or implement for 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

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 activities. **Note: Refer to Attachment 2 for conceptual plans and sections as applicable.**

- 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. **Note: Processing Fee is N/A**

Note: Applicant is Lee County, FL Public Utilities Department. Lee County is not technically applying for an ERP permit; this format is used at FDEP's request to organize information to be evaluated for the Power Plant Site Application for minor site improvements.

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: Rodriguez
Title: Engineering Manager,
Address: 10500 Buckingham Road
City: Fort Myers
Home Telephone:
Cell Phone: email address: RRodriguez2@leegov.com

First Name: Rebecca
Company: Lee County Solid Waste Division
State: FL
Work Telephone: 239 533 8914
Middle Initial:
Zip: 33905

E-mail Address:

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:	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: ☐

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: Castro	First Name: Donald	Middle Initial: J
Title: Vice President	Company: HDR Engineering, Inc	
Address: 4830 W. Kennedy Blvd., Suite 400		
City: Tampa	State: FL	Zip: 33609-2548
Home Telephone:	Work Telephone:	
Cell Phone:		
E-mail Address: Don.Castro@hdrinc.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: Swanson First Name: Sherri Middle Initial:
Title: Environmental Project Manager Company: HDR Engineering
Address: 2601 Cattlemen Road
City: Sarasota State: FL Zip: 34232
Home Telephone: Work Telephone: 941-342-2707
Cell Phone:
E-mail Address: sherri.swanson@hdrinc.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: 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: ☐

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

H. Real Property Interest Note: The Lee County Solid Waste Energy Recovery Facility is owned by the County, a political subdivision of the State of Florida.

- 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.

Note: Lee County is not technically applying for an ERP Permit; this format is used at FDEP's request to organize information to be evaluated for the Power Plant Site Application for minor site improvements.

Lee County Florida Public Utilities Dept. N/A

July 2, 2019

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

Signature of Applicant or Applicant's
Authorized Agent

Date

(Corporate Title if applicable)

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

Note: The County owned Solid Waste Energy Recovery Facility is open to the public during normal business hours, Mon-Fri. To gain access to site, proceed to Scale House, and identify yourself and on-site destination to attendant.

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.

Typed/Printed Name

Signature

Date

(Corporate Title if applicable)

C. Designation of Authorized Agent (If Applicable):

I hereby designate and authorize _____ 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.

Lee County Florida Public Utilities Dept. N/A

July 2, 2019

Typed/Printed Name of Applicant

Signature of Applicant

Date

(Corporate Title if applicable)

Section C: Supplemental Information for Works or Other Activities In, On, or Over Wetlands and/or Other Surface Waters

Instructions: **This section is for applications that do not involve activities associated with an individual single-family residence, duplex, triplex, or quadruplex. For those activities, please use Section B.** This form is to be completed if the proposed work or activity will occur in, on, over, or within 25 feet of a wetland or other surface water. The supplemental information required by this section is in addition to the information required by Section A of the application.

Part 1: Wetland or Other Surface Water Impact Summary

1. Describe the basic purpose of the project or activity:
Five project work areas are proposed to support improvements at the Lee County Solid Waste Complex
2. Total area of work (dredging, filling, construction, alteration, or removal) in, on, or over wetlands or other surface waters: 0.0 sq. ft.; 0 ac.
3. Total volume of material to be dredged or filled in wetlands or other surface waters:
 - a. to be dredged: 0 cubic yards,
 - b. to be filled: 0 cubic yards.
4. Identify the seasonal high water level (SHWL) and wetland normal pool elevations for each wetland or surface water within the project site. For tidal wetlands and/or surface waters provide the elevation of mean high and mean low water. Include an aerial photograph showing the location of each sampling location, dates, datum, and methods used to determine these elevations.
NA
5. Name of waterbody(ies) (if applicable & if known) in which work will occur?
NA
6. Is the activity proposed in an Outstanding Florida Water or Aquatic Preserve?
☐ yes, name: ☒ no ☐ I don't know
7. Has there ever been a formal or informal wetland determination for the project site? If yes, provide the identifying number and/or a copy of the jurisdictional map.
A field review was conducted 6/20/19. No wetlands or surface waters were observed within the project areas.
8. Provide a map(s) of the project area and vicinity delineating USDA/NRCS soil types.
9. Provide recent aeriels, legible for photointerpretation (no photocopies) with a scale of 1" = 400 ft, or more detailed, with project boundaries and wetland boundaries delineated on the aerial.
A map is provided.
10. Provide maps accurately portraying the existing and proposed natural vegetative community types and land cover classifications using recognized classification schemes. Suggested sources include: the Florida Natural Areas Inventory Guide to the Natural Communities of Florida (2010) available at <http://www.fnai.org/naturalcommguide.cfm>, or the Florida Land Use and Cover Classification

System (FLUCCS) (FDOT 1999, available at
<http://www.dot.state.fl.us/surveyingandmapping/documentsandpubs/fluccmanual1999.pdf>). For



vegetated areas dominated by exotic vegetation, use the descriptors representative of the native community type that was present prior to exotic infestation.

11. Impact Summary Tables (located at the end of this section):
 - a. For all projects, complete Table 1, 2 and 3 as applicable.
 - b. For shoreline stabilization projects, provide the information requested in Table 4.

Wetland and surface water impacts are not proposed.

12. If the activity is located on state owned submerged lands and requires a lease or easement, provide a list of names and addresses from the latest county tax assessment roll of all property owners located within a 500 ft. radius of the proposed lease or easement boundary in mailing label format, or you may elect to send notice to those persons by certified mail, with the return-receipt card addressed to the DEP or water management district, as applicable, in accordance with subsection 18-21.005(3), F.A.C., and Section 253.115, F.S. Attach additional sheets if necessary.

1. Name:
Mailing Address:
City, State, Zip Code:

2. Name:
Mailing Address:
City, State, Zip Code:

3. Name:
Mailing Address:
City, State, Zip Code:

4. Name:
Mailing Address:
City, State, Zip Code:

5. Name:
Mailing Address:
City, State, Zip Code:

6. Name:
Mailing Address:
City, State, Zip Code:

NA

Part 2: Environmental Considerations

Note: for many questions, a state statute/Applicant's Handbook Volume I (AH I) section is cited to assist the applicant in addressing these questions. However, additional federal criteria may apply.

1. Elimination or Reduction of Impacts (Avoidance and Minimization). Describe measures taken to eliminate or reduce impacts to wetlands and other surface waters (*Refer to AH I Section 10.2.1*).
Neither wetlands nor surface water impacts are proposed.
2. Fish, Wildlife, Listed Species, and their Habitats. Provide results of any wildlife assessments that have been conducted on the project site and provide any comments, biological opinions, formal or informal consultation decisions, or recommended actions you have received pertaining to the project from the Florida Fish and Wildlife Conservation Commission, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service. (*Refer to AH I Section 10.2.2*).

See Environmental Assessment Memo

Form #62-330.060(1) - Application for Individual and Conceptual Approval Environmental Resource Permit and Authorization to Use State-Owned Submerged Lands

Incorporated by reference in subsection 62-330.060(1), F.A.C. (June 1, 2018)

Section C, Page 2 of 10

3. Water quantity impacts to wetlands and other surface waters (*Refer to AH I Section 10.2.2.4 and AH II*).
 - a. Does the activity include a proposed surface water management system with a control elevation different than the wetland normal pool elevation(s) of existing or proposed created wetlands or other surface waters? **NA**
 - b. If yes to (a), provide documentation (e.g. drawdown assessment or other methods) that shows the proposed surface water management system will not change the hydroperiod of the existing or created wetland or other surface water.
4. Public Interest Test. Please describe how the proposed activity will ***not be contrary*** to the public interest, OR if such an activity significantly degrades or is located within an Outstanding Florida Water (OFW), that the regulated activity will be ***clearly in*** the public interest (*Refer to AH I Section 10.2.3*).
 - a. Please describe how the project will be designed to avoid adverse effects to public health, safety, or the welfare or the property of others.
The project involves improvements to an existing Lee County solid waste complex
 - b. Please describe how the project will be designed to avoid adverse effects to the conservation of fish and wildlife, including endangered or threatened species, or their habitats.
Neither wildlife habitat nor protected wildlife was observed within the complex
 - c. Please describe how the project will be designed to avoid adverse effects to navigation or the flow of water or cause harmful erosion or shoaling.
NA
 - d. Please describe how the project will be designed to avoid adverse effects to the fishing or recreational values or marine productivity in the vicinity of the activity.
NA
 - e. Will the project be of a temporary or permanent nature?
Permanent
 - f. Please describe how the project will be designed to avoid adverse impacts to significant historical and archaeological resources, under the provisions of section 267.061, F.S.
The project areas are within developed and/or filled uplands within the complex
 - g. Please describe how the project will be designed to avoid adverse effects to the current condition and relative value of functions being performed by areas affected by the proposed regulated activity.
NA
5. Water Quality.
Provide a description of how water quality will be maintained in wetlands and other surface waters that will be preserved or will remain undisturbed, both on and offsite. Please address both short-term (such as during construction) and long-term water quality considerations (*Refer to AH I Section 10.2.4*).
An NPDES permit will be obtained including BMPs to protect water quality.
6. Class II Waters; Waters approved for shellfish harvesting (*Refer to AH I Section 10.2.5*).
 - a. Will the project occur in Class II that are NOT approved for shellfish harvesting? If yes, please provide a plan or procedure detailing the measures to be taken to meet the requirements of *AH I Section 10.2.5(a)*.
No

- b. Is the project located adjacent to or in close proximity to Class II waters? If yes, please provide a plan or procedure detailing the measures to be taken to meet the requirements of *AH I Section 10.2.5(b)*.
No
- c. Is the project located in Class II or Class III waters that are classified as “approved”, “restricted”, “conditionally approved”, or “conditionally restricted”? If yes, demonstrate that the project meets the requirements of *AH I Section 10.2.5(c)*.
No
7. Vertical seawalls. Are vertical seawalls proposed in an estuary or lagoon as part of the project? If yes, please describe how the project meets the requirements of *AH I Section 10.2.6*.
NA
8. Secondary Impacts (*AH I Section 10.2.7*).
- Will an upland buffer, with a minimum width of 15' and an average width of 25', be provided between the proposed activities and existing wetlands or wetlands to be preserved, enhanced, restored, or created? Provide the location and dimension of all buffers on the plans. If not, demonstrate that secondary impacts will not occur or describe how they will be offset.
An average 25' buffer will be maintained from the wetland Conservation Areas. BMPs will ensure protection (See plans detail).
 - If listed species are present or may be present, then coordination with wildlife agencies is needed. Have you coordinated with the FFWCC and/or USFWS? If so, please provide correspondence from the wildlife agencies indicating concurrence with the species management plan(s).
The project areas were previously developed. Listed species would not be expected within the project areas.
 - What measures will be taken to avoid impacts to wetland-dependent wildlife and/or listed species that use uplands for nesting or denning?
The project will not impact wetlands or surface waters.
 - Describe whether there are any other relevant activities that are very closely linked and causally related to any proposed dredging or filling in wetlands or other surface waters that have the potential to cause impacts to significant historical and archaeological resources.
Impacts to these resources would not be expected.
 - Are there additional future phases or extensions of the proposed activities that are not shown? If yes, please describe.
Future improvements could be possible as long as the complex remains in operation. Any future funded project would be submitted as a separate submittal as a modification to the latest FDEP issued permit.
9. Cumulative Impacts. Is the proposed mitigation located within the same drainage basin (*Refer to AH I Figures 10.2.8.1 – 10.2.8.5*) as the proposed wetland impacts? If not, please submit a Cumulative Impact Evaluation in accordance with *AH I Section 10.2.8*.
There are not wetland or SW impacts proposed. Mitigation will not be required.
10. Mitigation Plan (*Refer to AH I Section 10.3*). NA
- ~~If a mitigation bank is proposed to offset wetland/other surface water impacts, provide:~~
 - ~~the name of the bank: . A letter of reservation from the banker will be required once the application has been evaluated.~~
 - ~~If the mitigation bank was assessed using UMAM, provide UMAM worksheets for impact area(s). If the bank was assessed using a method other than UMAM, then prepare the impact assessment using the same method.~~
 - ~~If mitigation is proposed to offset wetland/other surface water impacts, please provide a mitigation plan that includes, at a minimum, the following:~~
 - ☐ ~~Proposed mitigation narrative:~~

- (1) ☐ Describe the current and proposed condition for each type of mitigation component (restoration, enhancement, creation, preservation), including:
 - (a) ☐ Describe current and proposed vegetation
 - (b) ☐ Describe current and proposed hydrologic conditions for the proposed mitigation.
 - (c) ☐ Describe the soil types from NRCS maps and confirm if actual soil conditions appear to match.
- (2) ☐ Provide details of the proposed construction/mitigation activities including phasing and timing, as appropriate.
- (3) ☐ Identify measures that will be implemented during and after construction to avoid adverse impacts related to the proposed activities.
- (4) ☐ A mitigation implementation and monitoring schedule with dates.
- (5) ☐ Identify the success criteria.
- (6) ☐ Describe the anticipated site conditions in and around the mitigation area after the mitigation plan is successfully implemented.
- (7) ☐ Provide a comparison of current fish and wildlife habitat to expected habitat after the mitigation plan is successfully implemented.
- ii. ☐ Provide a Management Plan that includes, as appropriate, aspects of operation and maintenance, including water management practices, vegetation establishment, exotic and nuisance species control, fire management, and control of access.
- iii. ☐ Maps:
 - (1) ☐ Soil map (include soil names/codes, hydrologic soil groups and hydric soil types).
 - (2) ☐ Topographic map of the mitigation area and adjacent contributing and receiving areas.
 - (3) ☐ Hydrologic features map of the mitigation area and adjacent contributing and receiving areas.
 - (4) ☐ Vegetative communities map (using FLUCCS or other appropriate classification system).
 - (5) ☐ For all maps, identify source.
- iv. Provide the necessary supporting information for the application of sections 62-345.400-.600 (Uniform Mitigation Assessment Method (UMAM)). To meet this requirement, submittal of UMAM worksheets is acceptable for impact and mitigation areas.
- v. If onsite and/or offsite applicant responsible mitigation is proposed, submit a draft Conservation Easement document or other form of restrictive covenant that provides for protection of the mitigation area in perpetuity. Standard forms, as described in subsection 62-330.301(6), F.A.C., are available from the Agency or on its website.
- vi. If onsite and/or offsite applicant responsible mitigation is proposed, submit a cost estimate for completing the mitigation, including monitoring and maintenance.
- vii. If onsite and/or offsite applicant responsible mitigation is proposed and the proposed mitigation exceeds \$25,000, please provide a draft financial assurance document. Standard forms, as described in subsection 62-330.301(5), F.A.C., are available from the agency or on its website.
- viii. Identify the entity responsible for monitoring, maintenance, and long-term stewardship of the mitigation area (i.e. the landowner or homeowner association, not the consultant or contractor that will do the work).

Note: It is highly recommended that you coordinate the design of any mitigation plan that also may be required for the Corps permit to meet the requirements of both permits. Pre-application meetings with both the applicable Agency and the Corps can help you to choose a mitigation option that is acceptable to both the applicable Agency and the Corps.

Part 3: Plans

Plans: The information listed in the checklist below represents the typical information required on the submitted project plans. The Plans checklists in each application section are cumulative unless otherwise noted. Separate plans for each application section are not required.

1. ☐ Include the following on the construction plans and cross sections:
 - a. ☐ An Existing Conditions sheet showing the entire project and wetland/other surface water boundaries. Include the following: Acreage and type (herbaceous, forested or other surface water) of each wetland/other surface water.
 - b. ☐ A Proposed Conditions sheet showing the entire project and wetland/other surface water boundaries with construction plan overlay.
 - c. ☐ A Proposed Wetland Impact sheet that includes the following:
 - i. ☐ Acreage and type (herbaceous, forested, or other surface water) of each wetland/other surface water to be impacted.
 - ii. ☐ Proposed upland buffers with dimensions.
 - iii. ☐ Identify the seasonal high water and wetland normal pool elevations on the plans.
 - d. ☐ Include wetland boundaries on all construction plan sheets.
2. ☐ If onsite and/or offsite applicant-responsible mitigation is proposed, submit mitigation ~~permit~~ plans and cross sections including, at a minimum:
 - a. ☐ existing conditions plan sheet identifying upland and wetland communities and acreage of each, topography, drainage patterns, and location of cross-section detail.
 - b. ☐ proposed conditions plan sheet identifying proposed improvements by type (restoration, enhancement, creation, preservation), acreage of each, topography, drainage patterns, and location of cross-section detail.
 - c. ☐ monitoring plan sheet including proposed improvements, monitoring transects, photostations, and mitigation signage (if applicable).
 - d. ☐ cross-section and/or profile detail(s) sheet(s) including representative section of each type of mitigation component. Include existing and proposed conditions and representative elevations.
 - e. ☐ planting schedule, plant species including common and scientific names divided into three sections (canopy, shrub, herbaceous) by mitigation component, quantity, spacing, size, and elevation range.

Table 2 - Project On-Site Mitigation Summary

MITIGATION ID	UMAM ASSESSMENT AREA NAME(S)	TARGET TYPE	CREATION AREA (acres)	RESTORATION AREA (acres)	ENHANCEMENT AREA (acres)	WETLANDS PRESERVE AREA (acres)	UPLAND PRESERVE AREA (acres)	OTHER AREA (acres)
NA	NA							
PROJECT TOTALS:								

COMMENTS:

Codes (multiple entries per cell not allowed):

- Target Type or Type=Target or existing habitat type from an established wetland classification system or land use classification for non-wetland mitigation

Table 3 - Project Off-Site Mitigation Summary

MITIGATION ID	UMAM ASSESSMENT AREA NAME(S)	TARGET TYPE	CREATION AREA (acres)	RESTORATION AREA (acres)	ENHANCEMENT AREA (acres)	WETLANDS PRESERVE AREA (acres)	UPLAND PRESERVE AREA (acres)	OTHER AREA (acres)
NA								
PROJECT TOTALS:								

COMMENTS:

Codes (multiple entries per cell not allowed):

- Target Type or Type=Target or existing habitat type from an established wetland classification system or land use classification for non-wetland mitigation



Technical Memorandum

Date: June 24, 2019
Project: Lee County Solid Waste Complex
To: Lee County
From: HDR Engineering
Subject: Environmental Assessment

HDR performed an environmental assessment within the Lee County Solid Waste Complex (i.e. Buckingham Complex) for potential wetlands and/or surface waters as well as threatened or endangered species concerns. Five project areas were reviewed:

- Project Area 1 – SWERF Operator Maintenance Storage Shed
- Project Area 2 – SWERF Operator Spare Parts Storage Warehouse
- Project Area 3 – LCSW Fleet Maintenance Storage Building
- Project Area 4 – Entrance Road Turn-around
- Project Area 5 – Transfer Station Employee Building

Project Overview

The project is located in Lee County north of Buckingham Road (SR82A) in Section 24; Township 44S; Range 25E (**Figure 1**). The Buckingham Complex houses the majority of the County's Municipal Solid Waste (MSW) disposal and recycling operations of the Solid Waste System. The various solid waste components included in the complex are the County-operated Scale House where all incoming materials must be weighed and categorized, the Resource Recovery Facility (RRF) for incoming processible materials (primarily MSW), the Recyclable Materials Processing Facility (RMPF) for incoming recyclable materials, the horticultural area for yard waste, the "tire pad" for disposal of passenger and light truck tires, the Construction and Demolition Debris (C&DD) Facility for dedicated loads of construction and demolition materials, and the Buckingham Transfer Station (BTS) for processing during relatively rare peak periods or periods of major maintenance of the RRF or RMPF. The complex also contains the Vehicle Maintenance Shop (VMS) that is used for maintaining the Solid Waste Division's vehicles, trucks, and equipment.

The complex address is 10500 Buckingham Road, Fort Myers, FL 33905.

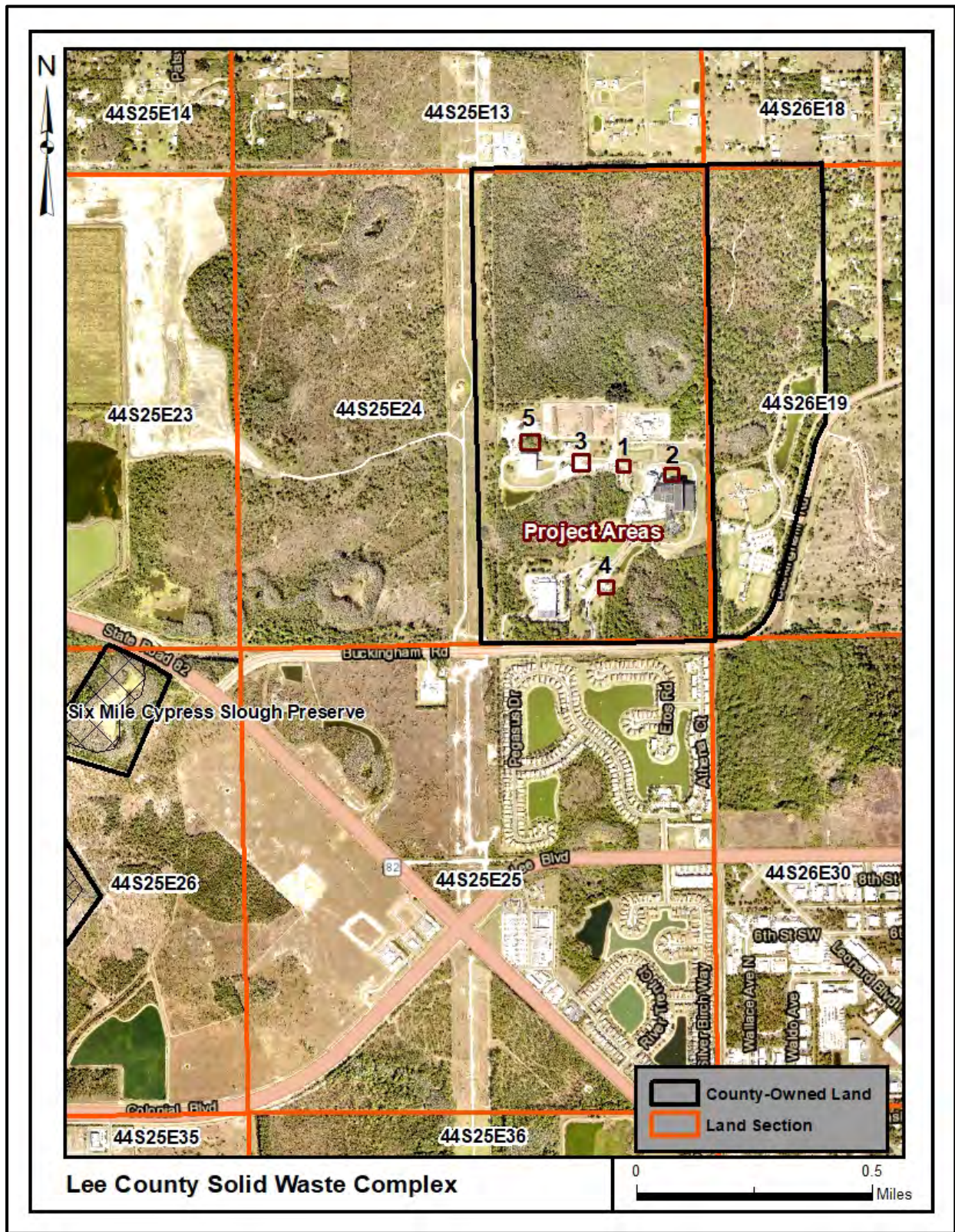


Figure 1. Location Map



Existing Conditions and Soils

The project site is an active solid waste processing complex with the aforementioned components.

Project Areas 1, 2, 3 and 4 were previously filled for development and hardened, sodded, and/or landscaped. Although these areas were mapped with hydric soils, the native soils were no longer present. These areas were landscaped uplands. Landscape vegetation included live oak (*Quercus virginiana*), slash pine (*Pinus elliotii*), and cabbage palm (*Sabal palmetto*).

Project Area 5 was a dry detention area surrounded by a parking lot, a graveled equipment storage lot, and a road. The soils were mapped with Boca fine sand (13), a non-hydric soil. Soil shovel tests confirmed the absence of hydric soils. Vegetation included laurel oaks (*Quercus laurifolia*), slash pine, and cabbage palm (*Sabal palmetto*).

A USDA Natural Resource Conservation Service (NRCS) soil survey map is provided as **Figure 2**.

Wetlands and Surface Waters

A field review was conducted to evaluate existing conditions and natural communities and to characterize habitat types. Neither wetlands nor surface waters were observed. Project Area 1 contained gravel and debris from a building that previously occupied the site footprint. Project Area 2 was a sodded field with landscaping. Project Area 3 was a parking lot for the VMS. Project Area 4 was an asphalt parking lot and a sodded field with landscaping. Project Area 5 was a dry retention area with native trees.

Protected Wildlife and Habitat

A desktop analysis was performed to evaluate wildlife records pertaining to protected species found in this region. This analysis was followed by a site inspection to characterize habitat and evaluate the area for the potential to support state and/or federally protected species. Neither critical wildlife habitat nor protected wildlife was recorded for this site nor observed during the site review.

The project site is within the U.S. Fish and Wildlife Service Consultation Areas of the red-cockaded woodpecker (*Leuconotopicus borealis*) and the Florida scrub-jay (*Aphelocoma coerulescens*) and is within the 18.6-mile core foraging buffer of wood stork (*Mycteria americana*) colonies along the Caloosahatchee River. Project Area 5 occurs at the outer limits of the USFWS secondary zone for the Florida panther (*Puma concolor coryi*). The potential presence of and impact to these and other protected wildlife is discussed below.

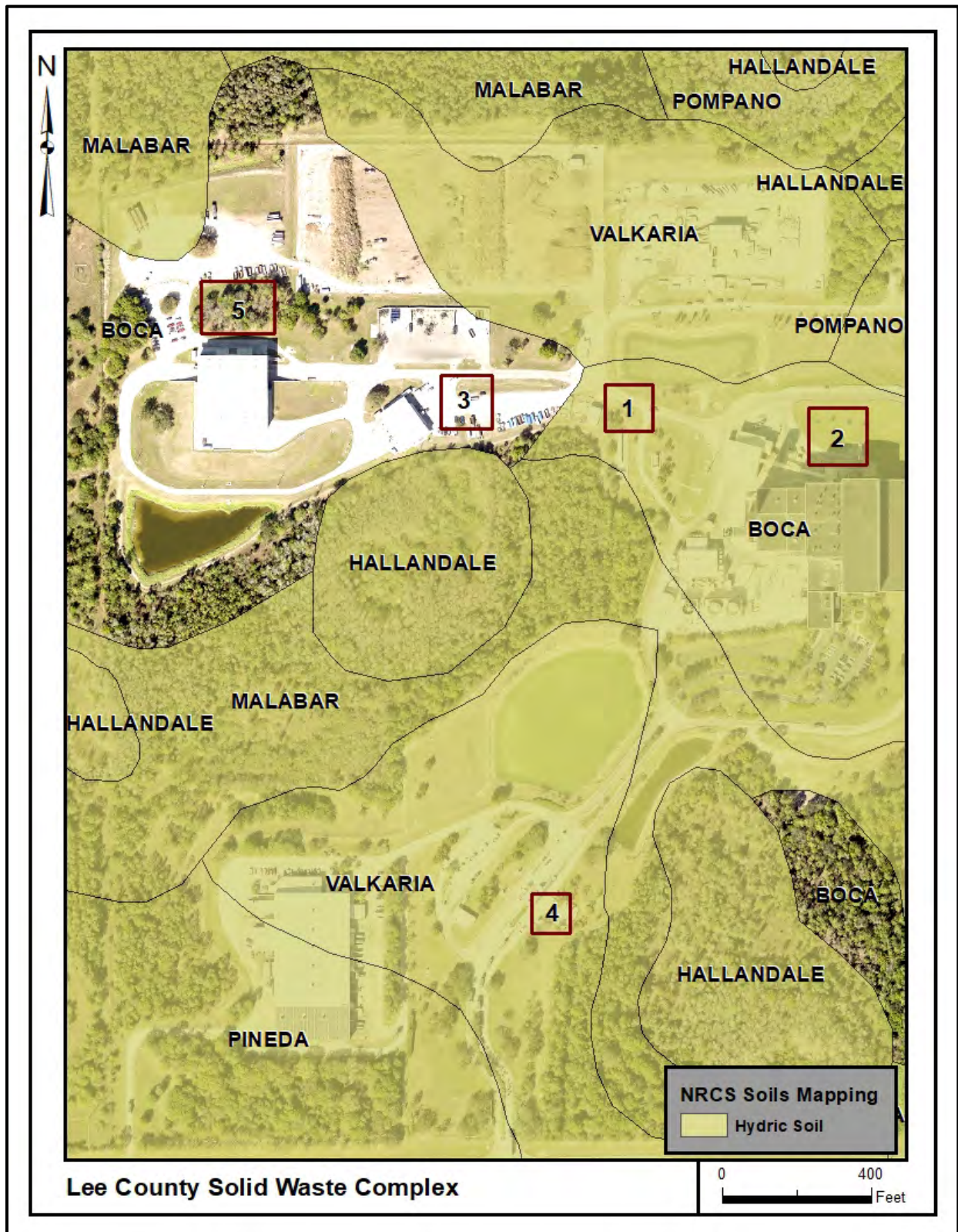


Figure 2. USDA NRCS Soil Survey Map



Based on existing conditions within each project area, impacts to protected wildlife would not be expected. Mature living pine trees needed to support the red-cockaded woodpecker were not present within the project areas. Scrub habitat necessary for the Florida scrub-jay was not observed. While the wood stork could utilize stormwater ponds and conservation wetlands within the solid waste complex – but not within the five project areas – for foraging and roosting, none were observed and given the absence of foraging habitat within the project areas, none would be expected. The five project areas were developed and under active operation as a solid waste processing complex; therefore, habitat to support the Florida panther was not present. The Eastern indigo snake (*Drymarchon corais couperi*) could potentially utilize this site. To protect this species during construction, contractors would adhere to the USFWS *Standard Protection Measures for the Eastern Indigo Snake* (USFWS, 2013), which requires that all workers be made aware of the potential presence of this species. Neither the gopher tortoise (*Gopherus polyphemus*) nor gopher tortoise burrows were observed.

Permitting

These proposed developments would not require a Section 404 dredge and fill permit from the U.S. Army Corps of Engineers (USACE) given the absence of Waters of the U.S. within the specific project areas.

The project is within the Tidal Caloosahatchee Watershed and the Orange River Drainage Basin, and is under the regulatory jurisdiction of the Florida Department of Environmental Protection (FDEP), South District in Fort Myers, Florida. Given the absence of jurisdictional wetlands or surface waters, the project would only need to address stormwater quantity and quality as part of the Environmental Resource Permitting. Since wetlands were not present, wetland mitigation would not be required.

Given the absence of habitat, protected species permitting would not be expected.

Section E: Supplemental Information Required for Works or Other Activities Involving a Stormwater Management System (Other Than a Single-Family Project)

Instructions: The information listed in the checklists below represents the level of information that is usually required to evaluate an application. Information can be provided within reports, plans, and documents. The level of information required for a specific project will vary depending on the nature and location of the site and the activity proposed. Conceptual approvals generally do not require the same level of detail as a construction permit. However, providing a greater level of detail will reduce the need to submit additional information at a later date. If an item does not apply to your project, proceed to the next item. The supplemental information required by this section is in addition to the information required by Section A of the application.

Part 1: Stormwater Management System Summary

Provide drainage calculations, signed and sealed by an appropriate registered professional, and supporting documentation demonstrating that the proposed project meets the conditions for issuance under 62-330.301(1)(a),(b),(c),(e), F.A.C. The drainage calculations should include, but not necessarily be limited to, the following:

1. General Site Information:

- a. ☒ Provide pre-development and post-development drainage map(s), as appropriate, that include drainage patterns and basin boundaries with acreage served by each hydraulically separate system, showing the direction of flows, including any off-site runoff being routed through or around the system; topographic information; and connections between wetlands and other surface waters.
- b. ☐ Provide the results of any percolation tests, where appropriate, and soil borings that are representative of the actual site conditions. Identify the wet season high water table elevations, soil profiles, and hydraulic conductivity. Include dates, datum, and methods used to determine these soil parameters.
- c. ☐ Identify the onsite hydrologic soil classification (e.g. Type A, B/D, D). Reference the source, such as the USDA/NRCS Soil Survey, used in estimating the onsite hydrologic soil classification. Provide maps, as appropriate, with the project limits delineated.
- d. ☒ Identify the seasonal high water or mean high tide elevation for receiving waters/wetlands into which runoff will be discharged. Include dates, datum, and methods used to determine these elevations.
- e. ☒ Identify the name of each receiving waterbody to which the proposed stormwater management system will discharge: _____.
- f. ☒ Indicate the existing land use and land cover.
- g. ☒ Provide the acreage and percentages of the total project, of the following:
 1. Impervious surfaces (excluding buildings, wetlands, and other surface waters);



2. Buildings;
 3. Pervious surfaces (green areas not including wetlands);
 4. Lakes, canals, retention areas, other open water areas; and
 5. Wetlands (Please compare to Section C to ensure consistency in wetland acreages).
- h. ☐ Provide the location and description of any nearby existing offsite features (such as wetlands and other surface waters, stormwater management ponds, and buildings or other structures) which might be affected by or affect the proposed construction or development.

2. Water Quality Analysis:

- a. ☒ Provide a description of the proposed stormwater treatment methodology that addresses the type of treatment, pollution abatement volumes, and recovery analysis.
- b. ☐ Is the receiving waterbody known to be impaired and/or have an established Total Maximum Daily Load (TMDL) or Basin Management Action Plan (BMAP)? If so, please provide specific descriptions of all water quality parameters for which the waterbody is known to be impaired. For more information about water quality, impaired waters, and to determine whether a TMDL has been adopted in your project area, refer to: <https://floridadep.gov/dear/water-quality-evaluation-tmdl/content/final-tmdl-reports>. To determine whether a BMAP exists, or is being developed in your project area, refer to: <https://floridadep.gov/dear/water-quality-restoration/content/basin-management-action-plans-bmaps>.
☐ yes ☒ no ☐ don't know
 If yes, provide calculations demonstrating that the proposed project will not contribute to violations of state water quality standards in accordance with the applicable Applicant's Handbook, Vol. II.
- c. ☐ Does the project have a direct discharge to a Class I or II waters; Outstanding Florida Waters (OFW); or Class III waters, which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting? *To determine whether your project is within or will discharge to an OFW, or for more information about OFWs in general, refer to: <https://floridadep.gov/dear/water-quality-standards/content/outstanding-florida-waters>.*
☐ yes ☒ no ☐ don't know
 If yes, additional treatment in accordance with the applicable Applicant's Handbook, Vol. II, may be required.
- d. ☐ Provide construction plans and calculations that address the required treatment volume and recovery, as well as stage-storage and design elevations, which demonstrate compliance with the appropriate water quality treatment criteria in the applicable Applicant's Handbook, Vol. II.
- e. ☒ Provide a description of the engineering methodology, assumptions, and references for the parameters listed above and a copy of all such computations, engineering plans, and specifications used to analyze the system. If a computer program is used for the analysis, provide the name of the program, a description of the program, input and output data, and justification for model selection.

3. Water Quantity Analysis:

Provide calculations and documentations demonstrating that the project, as proposed, meets the applicable design criteria as indicated in the applicable Applicant's Handbook, Vol. II. Typically, the information would include, at a minimum, but is not necessarily limited to, the following:

- a. ☒ For projects requiring pre-development analysis, provide an analysis of the pre-development peak rate of discharge and/or volume of runoff, for all design storm events.

Account for all onsite depressional storage and offsite contributing area. Please refer to the applicable Applicant's Handbook, Vol. II for the design storm event(s) that apply to your project.

- b. ☒ Provide an analysis of the post-development peak rate of discharge and/or volume of runoff for all applicable design storm events. Account for all onsite storage and offsite contributing area. Please refer to the applicable Applicant's Handbook, Vol. II for the design storm event(s) and criteria that apply to your project.

These analyses should include:

1. ☒ Runoff characteristics, including area, runoff curve number or runoff coefficient, and time of concentration for each drainage basin in the pre-development and post-development condition;
 2. ☒ Design storms used including rainfall depth, duration, frequency, and distribution;
 3. ☒ Runoff hydrograph(s) for each drainage basin, for all required design storm event(s);
 4. ☒ Stage-storage computations for any area, such as a reservoir, closed basin, detention area, or channel, used in storage routing;
 5. ☒ Stage-discharge computations for any storage areas at a selected control point, such as control structure or natural restriction;
 6. ☒ Flood routings through on-site conveyance and storage areas;
 7. ☒ Water surface profiles in the primary drainage system for each required design storm event(s);
 8. ☒ Runoff peak rates and volumes discharged from the site for each required design storm event(s);
 9. ☐ Design tailwater elevation(s) for each storm event at all points of discharge (include source or method of estimate); and
 10. ☐ Pump specifications and operating curves for range of possible operating conditions (if used in system).
- c. ☒ Provide a description of the engineering methodology, assumptions, and references for the parameters listed above, and a copy of all such computations, engineering plans, and specifications used to analyze the system. If a computer program is used for the analysis, provide the name of the program, input and output data, justification for model selection, and, if necessary, a description of the program.

4. Floodplain Analysis (where applicable).

- a. ☐ If the project is in a known floodplain of a stream or other water course, identify the appropriate floodplain boundary and approximate flooding elevations of any lake, stream, or other watercourse located on or adjacent to the site.
- b. ☐ For traversing works, in accordance with the applicable Applicant's Handbook, Vol. II, provide:
 1. ☐ Hydraulic calculations for all proposed traversing works; and
 2. ☐ Water surface profiles showing upstream impact of traversing works.
- c. ☐ For impacts to regulated floodplains, in accordance with the applicable Applicant's Handbook, Vol. II, provide:
 1. ☐ Location and volume of encroachment within regulated floodplain(s); and
 2. ☐ Plans and calculations for compensating floodplain storage, if necessary, and calculations required for determining minimum building and road flood elevations.

Part 2: Construction Plans

1. Provide clear, construction level detailed plans for the system. The plans must be signed and sealed by an appropriate registered professional as required by law. These plans should include cumulative information from all applicable sections, as well as the following:
 - a. ☒ Project area boundary and total land area (as defined in A.H. Vol. I, subsection 2.0(a)(107), including distances and orientation from roads or other landmarks.
 - b. ☐ Existing topography extending at least 100 feet off the project area. All topography shall include location and description of benchmarks, reference to NGVD 1929 or NAVD 1988 along with the conversion factor.
 - c. ☐ Proposed site plan with acreage, including the following:
 1. ☒ plan view of proposed development, including impervious surfaces and water management areas;
 2. ☒ land cover and natural communities*;
 3. ☐ wetlands and other surface waters*;
 4. ☐ undisturbed uplands*;
 5. ☐ aquatic communities*;
 6. ☐ proposed buffers*;
 7. ☐ proposed impacts to wetlands and other surface waters, and any proposed connections/outfalls to other surface waters or wetlands, (if applicable); and
 8. ☐ onsite wetland mitigation areas*.
 9. ☐ For phased projects, provide a master development plan clearly delineating the limits of each phase of construction.

*Information should reflect that provided in Section C.
 - d. ☐ Paving, Grading, and Drainage Information, which includes, but is not necessarily limited to, the following:
 1. ☐ Existing topography;
 2. ☐ Boundaries of wetlands and other surface waters and upland buffers (see Section C);
 3. ☐ Plan view of proposed development;
 4. ☐ Proposed elevations and/or profiles, including:
 - a) ☐ roadway, parking, and pavement grades;
 - b) ☐ floor slabs, walkways, and other paved surfaces;
 - c) ☐ earthwork grades for pervious landscaped areas; and
 - d) ☐ perimeter site grading, tying back into existing grades.
 5. ☐ Location of all water management areas, including elevations, dimensions, side slopes, and design water depths;
 6. ☐ Location, size, and invert elevations of existing and proposed stormwater conveyance systems;
 7. ☐ Vegetative cover plan for all on-site and off-site earth surfaces disturbed by construction; and
 8. ☐ Rights-of-way and easements for the system, including all on-site and off-site areas to be reserved for water management purposes (including access), and rights-of-way and easements for the existing drainage system, if any.
 - e. ☐ Stormwater detail information, including but not necessarily limited to, the following:
 1. ☐ Cross section of all stormwater management areas, including elevations, dimensions, side slopes, and proposed stabilization measures (with location of the cross section(s) shown on the corresponding plan view);
 2. ☐ Detail of all proposed control structures, including elevations, dimensions, and skimmer, where applicable; and

3. ☐ Details of proposed stormwater management systems, such as underdrains, exfiltration trenches, vaults, and other proposed Best Management Practices (BMPs).

- f. ☐ Location and description of any nearby existing offsite features (such as wetland and other surface waters, stormwater management ponds, and building or other structures) which might be affected by or affect the proposed construction or development.

Part 3: Construction Schedule and Techniques

Provide a construction schedule, and a description of construction techniques, sequencing, and equipment. This information should include, as applicable, the following.

- a. ☐ Access and staging of equipment;
- b. ☐ Location and details of the erosion, sediment, and turbidity control measures to be implemented during each phase of construction and all permanent control measures to be implemented in post-development conditions.
- c. ☐ The location of disposal site(s) for any excavated material, including temporary and permanent disposal sites.
- d. ☐ A demolition plan for any existing structures to be removed.
- e. ☐ Dewatering plan details. If dewatering is required, detail the dewatering proposal including the methods that are proposed to contain the discharge, methods of isolating dewatering areas, and indicate the period dewatering structures will be in place. **Note: A Consumptive Use or Water Use permit may be required for dewatering.**
- f. ☐ Methods for transporting equipment and materials to and from the work site. If barges are required for access, provide the low water depths and draft of the fully loaded barge;

Part 4: Operation and Maintenance and Legal Documentation:

- a. ☐ Describe the overall maintenance and operation schedule for the proposed system.
- b. ☒ Identify the entity (or entities) that will be responsible for operating and maintaining the system (or parts of the system) to demonstrate that the entity (or entities) meet(s) the requirements of section 12.3 of the Applicant's Handbook, Vol. I.
 - 1. ☐ If different from the permittee, provide a draft document enumerating the enforceable affirmative obligations on the entity to properly operate and maintain the system for its expected life and documentation of the entity's financial responsibility for long-term maintenance.
 - 2. ☐ If the proposed operation and maintenance entity is not a property owner's association, provide proof of the existence of an entity or the future acceptance of the system by an entity which will operate and maintain the system.
- c. ☐ Provide drafts of all proposed conservation easements, stormwater management system easements, draft property owner's association documents, and plats for the property containing the proposed system.
- d. ☐ Provide legal reservations for access to the treatment system for maintenance and operation by future maintenance entities for subdivided projects.
- e. ☐ Provide indication of how water and wastewater service will be supplied.

- f. ☐ Provide a copy of the boundary survey and/or legal description and acreage of the total land area of contiguous property owned/controlled by the applicant.
- g. ☐ If any associated land agreements are required to implement the proposed activities, such as flowage easements across lands not owned by the applicant, include such documentation. If negotiations are underway, but not yet concluded, regarding such land use agreements, please indicate that and provide an anticipated date for providing that documentation. A permit cannot be issued for an activity to use lands that are not owned by the applicant or for which the applicant does not hold a sufficient real property interest to use those lands.

Part 5: Water Use

- a. ☐ Describe how irrigation will be provided to the project. Will the surface water system be used for water supply, including landscape irrigation, or recreation?
- b. ☐ If a Consumptive Use or Water Use permit has been issued for the project, state the permit number:
- c. ☐ If a Consumptive Use or Water Use permit has not been issued for the project, indicate if such a permit will be required. ☐ yes ☐ no ☐ don't know
If yes, please indicate when the application for a permit will be submitted:
- d. ☐ Indicate how any existing wells located within the project site will be utilized or abandoned.

Part 6: Special Basin Information

- a. Is your project within a special basin as described in the applicable Applicant's Handbook, Vol. II?
☐ yes ☒ no ☐ don't know
- b. If yes, please demonstrate that the project will meet the applicable special basin criteria.

ATTACHMENT A

STORMWATER CALCULATIONS

HDR Memo

Date: Friday, June 21, 2019

Project: Lee County Solid Waste Energy Recovery Facility (SWERF)

To: File

From: M.Oural/D.J. Castro

Subject: Lee County SWERF Additions - Stormwater Calculations

The stormwater calculations herein are an addition/modification to an existing permit Lee County Solid Waste Energy Recovery Facility (SWERF) within Section 24, Township 44 South and Range 25 East, Lee County, Florida. A number of new features are to be added on the property and pervious/impervious areas will be changed. The calculations included in this document show areas that are not fully determined/constructed yet and final areas may differ. Calculation methods and design criteria used are taken from previous renditions of this facility permit(s) to ensure no discrepancies from the initial design.

Features to be added (Attachment E):

1. SWERF Operator Maintenance Storage Shed – CLI Provided Drawings
2. SWERF Operator Spare Parts Storage Warehouse – CLI Provided Drawings
3. LCSW Fleet Maintenance Storage Building – 5,686 sq.ft.
4. New Entrance Turn-Around (minimal impacts)
5. Transfer Station Employee Building

The site is divided into basins 1 through 6, which make up two larger drainage basins. Basins 1 & 3 make up the first Drainage Basin (referred to as “Drainage Basin 1 & 3”), and Basins 2, 4, & 6 make up the second Drainage Basin (referred to as “Drainage Basin 2, 4, & 6”). Calculations included in this document analyze the runoff from 3 storm events for the Drainage Basin 2, 4, & 6 only. The storm events used are the 10-year 24-hour (used for road elevations), 25-year 72-hour (used for design), and the 100-year 72-hour (used for finished floor elevations). There are no planned improvements in Basins 3 and 5.

Note that the SWERF Operator Maintenance Storage Shed in Area 1 lies on the dividing line of two basins (2 & 4) and will be treated as half the total impervious area for Area 1 for basins 2 & 4 (0.02 acres for each basin).

Note that Area 2, the SWERF Operator Spare Parts Storage Warehouse, is 0.03 acres associated with building roofs.

Note that Area 3, the Fleet Maintenance Storage Building, (5,686 sq. ft. = 0.13 acres) has been separated as 0.1 acres associated with building roofs and 0.03 acres associated with roads and parking.

Note that Area 4 is a proposed turn-around that is 0.065 acres and is the only contributing impervious area associated with Drainage Basin 1 & 3. When compared to the impervious impact on Drainage Basin 2, 4, & 6 of 1.33 acres, it is relatively minute. Given the similar sizes of the two Drainage Basins, and the additional impervious areas associated with each, it can be concluded that Drainage Basin 1 & 3 will not see a sizeable impact in stormwater runoff due to the New Entrance Turn-Around.

Note that Area 5 is a Transfer Station Employee Building that is 0.13 acres, 0.1 acres associated with building roofs and 0.03 acres associated with roads and parking.

Cc: Rebecca Rodriguez, Lee County Solid Waste Division

Jason Fournier, Lee County Solid Waste Division

Kyle Perrin, HDR



Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

I. Given:

A. Existing Acreage

Basin 1

1. Total	=	31.60 acres
2. Impervious		
a. Building (roof)	=	2.29 acres
b. Roads and Parking	=	4.58 acres
3. Ponds	=	5.20 acres
4. Pervious	=	19.53 acres

Basin 2

1. Total	=	14.80 acres
2. Impervious		
a. Building (roof)	=	1.40 acres
b. Roads and Parking	=	1.11 acres
3. Ponds	=	2.26 acres
4. Pervious	=	10.03 acres

Basin 3

1. Total	=	11.00 acres
2. Impervious		
a. Building (roof)	=	1.99 acres
b. Roads and Parking	=	6.93 acres
3. Ponds	=	0.00 acres
4. Pervious	=	2.08 acres

Basin 4

1. Total	=	24.60 acres
2. Impervious		
a. Building (roof)	=	2.41 acres
b. Roads and Parking	=	8.35 acres
3. Ponds	=	1.30 acres
4. Pervious	=	12.54 acres

Basin 5

1. Total	=	5.52 acres
2. Impervious		
a. Building (roof)	=	0.16 acres
b. Roads and Parking	=	2.42 acres
3. Ponds	=	1.00 acres



Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

4. Pervious = 1.94 acres

Basin 6

1. Total = 4.75 acres

2. Impervious

a. Building (roof) = 0 acres

b. Roads and Parking = 2.28 acres

3. Ponds = 0.70 acres

4. Pervious = 1.77 acres

B. Proposed Acreage

Basin 1

1. Total = 31.60 acres

2. Impervious

a. Building (roof) = 2.29 acres

b. Roads and Parking = 4.645 acres (0.065) acres addition for area 4

3. Ponds = 5.20 acres

4. Pervious = 19.47 acres

Basin 2

1. Total = 14.80 acres

2. Impervious

a. Building (roof) = 1.45 acres (0.02+0.03) acres addition for area 1&2

b. Roads and Parking = 1.11 acres

3. Ponds = 2.26 acres

4. Pervious = 9.98 acres

Basin 3

1. Total = 11.00 acres

2. Impervious

a. Building (roof) = 1.99 acres

b. Roads and Parking = 6.93 acres

3. Ponds = 0.00 acres

4. Pervious = 2.08 acres

Basin 4

1. Total = 24.60 acres

2. Impervious

a. Building (roof) = 2.53 acres (0.02+0.1) addition for area 1&3



Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

b. Roads and Parking	=	8.38 acres	(0.03) addition for area 3
3. Ponds	=	1.30 acres	
4. Pervious	=	12.39 acres	

Basin 5

1. Total	=	5.52 acres	
2. Impervious			
a. Building (roof)	=	0.16 acres	
b. Roads and Parking	=	2.42 acres	
3. Ponds	=	0.00 acres	
4. Pervious	=	2.94 acres	

Basin 6

1. Total	=	4.75 acres	
2. Impervious			
a. Building (roof)	=	0.1 acres	(0.1) addition for area 5
b. Roads and Parking	=	2.31 acres	(0.03) addition for area 5
3. Ponds	=	0.70 acres	
4. Pervious	=	1.64 acres	

C. Proposed Acreage (combined Basins)**Basins 2, 4, & 6 (Maintenance Shed, Warehouse Addition, Maintenance Area Offices and Surrounding Area, and Transfer Station Employee Building) Combined**

1. Total	=	44.15 acres	
2. Impervious			
a. Building (roof)	=	4.08 acres	
b. Roads and Parking	=	11.80 acres	
3. Ponds	=	4.26 acres	
4. Pervious	=	24.01 acres	

D. Minimum Elevations

1. Roads and Parking	=	23.8 ft. NGVD
2. Finish Floor Elevations for Basin 2 & 4	=	24.75 ft. NGVD

E. Zoning: Site is Industrial Planned Development (IPD)

F. Allowable Discharge (25-Year, 3-day Storm)	=	37.00 csm (existing condition)
	=	0.06 cfs/acre

Allowable Discharge for Basins 2, 4 & 6 combined	=	2.649 cfs
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Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

G. Water Level Elevations

1. Wet Season Water Table	=	21.4 ft. NGVD
2. Receiving Water Elevation	=	21.7 ft. NGVD

H. Design Storm Rainfall Amounts:

1. Roads (10-Yr, 24-hour event)	=	6.4 inches
2. Design (25-Yr, 72-hour event)	=	9.8 inches
3. Floor (100-Yr, 72-hour event)	=	12.2 inches

*Values from previous permit calculations (Attachment C, SFWMD ERP Information Manual. Vol. IV, 2014 Fig. C-4, C-8 & C-9)

II. Design Criteria:

A. Quality

- Per ERP info. Manual Vol.IV, 2014, Basis of Review, Section 5.2.1, if a wet detention system, then whichever is greater of,
 - The first inch of runoff from the entire site or,
 - The amount of 2.5 inches times the percentage of imperviousness.
- Per ERP Info. Manual Vol. IV, 2014, Basis of Review, Section 5.2.1, if a dry detention system, then provide 75% of the required volume for wet detention.
- Per ERP Info. Manual Vol. IV, 2014, Basis of Review, Section 5.2.1, if a retention system, then provide 50% of the required volume.
- Because the site zoning is "Industrial", at least 0.5 inch of dry detention or retention pre-treatment shall be provided, per ERP Info. Manual Vol. IV, 2014, Basis of review, Section 5.2.2.
- Per ERP Info. Manual Vol. IV, 2014, Basis of Review, Section 5.2.2, any detention system shall be designed to discharge not more than 0.5 inches of the detained volume per day.

B. Quantity

- Roads
 - Centerline of roads are desired to be no lower than centerline elevation of Buckingham Road. Centerline of Buckingham Road is 23.8 ft. NGVD.
 - Roads shall be at least 2 feet above minimum control structure elevation
 $21.76 + 2.00 = 23.76 \text{ ft. NGVD} \longrightarrow \text{OK}$



Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

2. The site is located within the Lee County's Six Mile Cypress Slough. The allowable discharge per site certification application No. 90-30H is 37 csm.

3. Finish Floor elevations for Basins 2, 4 & 6 are desired to be no lower than 24.75 ft. NGVD.

III. Computations (Basins 2, 4, & 6 combined)

A. Quality

1. Compute the first inch of runoff from the developed project:

$$= 1 \text{ in.} \times 44.15 \text{ ac.} \times (1 \text{ ft./} 12 \text{ in.})$$

$$= \underline{3.68} \text{ ac-ft for the first inch of runoff}$$

2. Compute 2.5 inches times the percentage of imperviousness:

a. Site area for water quality pervious/impervious calculations only

$$= \text{Total Project} - (\text{water surface} + \text{roof}) \quad \text{Per ERP Information Manual Vol, IV, 2014 Basis of Review,}$$

$$= 44.15 \text{ ac} - (4.08 \text{ ac} + 4.26 \text{ ac}) \quad \text{Section 5.5.5c.}$$

$$= \underline{35.81} \text{ ac of site area for water quality pervious/impervious}$$

b. Impervious area for water quality pervious/impervious calculations only

$$= (\text{site area for water quality pervious/impervious}) - \text{pervious}$$

$$= 35.81 \text{ ac} - 24.01 \text{ ac}$$

$$= \underline{11.8} \text{ ac of impervious area for water quality pervious/impervious}$$

c. Percentage of imperviousness for water quality

$$= (\text{Impervious area for water quality} / \text{Site area for water quality}) \times 100\%$$

$$= (11.8 \text{ ac} / 35.81 \text{ ac}) \times 100\%$$

$$= \underline{33} \% \text{ impervious}$$

d. For 2.5 inches times the percentage impervious

$$= 2.5 \text{ in.} \times \text{percentage impervious}$$

$$= 2.5 \text{ in.} \times 0.33$$

$$= \underline{0.825} \text{ in. to be treated}$$

e. Compute volume required for quality detention

$$= \text{inches to be treated} \times (\text{total site} - \text{pond area})$$

$$= 0.825 \text{ in.} \times (44.15 \text{ ac} - 4.26 \text{ ac}) \times (1 \text{ ft.} / 12 \text{ in.})$$

$$= \underline{2.74} \text{ ac-ft required detention storage}$$



Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

3. Since the 2.74 ac-ft is less than the 3.68 ac-ft computed for the first inch of runoff, the volume of 2.74 ac-ft controls.

(System is wet detention, so no volume reductions are possible.)

4. Compute 0.5 in. of pre-treatment (which shall include roof areas)

$$= 0.5 \text{ in.} \times (\text{total site} - \text{pond})$$

$$= 0.5 \text{ in.} \times (44.15 \text{ ac} - 4.26 \text{ ac}) \times (1 \text{ ft.} / 12 \text{ in.})$$

$$= \underline{1.66} \text{ ac-ft required for pre treatment}$$

5. Compute required detention pond volume

$$= \text{Total required detention} - \text{pre-treatment}$$

$$= 3.68 \text{ ac-ft} - 1.66 \text{ ac-ft}$$

$$= \underline{2.02} \text{ ac-ft required detention pond volume}$$

B. Project surface storage

1. Assumptions

- Per ERP Informational Manual, Vol. IV, 2014, Basis of Review, Section 8.1 - Pond storage begins at a control elevation which is the given wet season water table elevation of 21.4 ft. NGVD.
- Pond storage is vertical over the 4.26 ac. of pond surface area.
- Site storage is linear, starting with some reaches of roadside swales which is verified by latest survey to be approx. 22.0 ft. NGVD.
- Grading, including road access will not be lower than the peak elevation of the 25-year, 72-hour (design) storm.
- Existing drainage basins 2, 4, & 6 are combined into one drainage basin.
- Outfall pipe is large enough so that the design storm discharge is not controlled by the culvert.

2. Generation of the Project Stage-Storage Curve

Stage (ft. NGVD)	Pond (ac-ft)	Site (ac-ft)	Project (ac-ft)
21.4	0	0	0.00
22	$4.26 \times 0.60 = 2.56$	0	2.56
22.8	$4.26 \times 1.40 = 5.96$	$(0.8 \times 35.81 \times 0.8) / (3.25 \times 2) = 3.53$	9.49
23	$4.26 \times 1.60 = 6.82$	$(1.0 \times 35.81 \times 1.0) / (3.25 \times 2) = 5.51$	12.33
23.2	$4.26 \times 1.80 = 7.67$	$(1.2 \times 35.81 \times 1.2) / (3.25 \times 2) = 7.94$	15.61
23.5	$4.26 \times 2.10 = 8.95$	$(1.5 \times 35.81 \times 1.5) / (3.25 \times 2) = 12.41$	21.36
24	$4.26 \times 2.60 = 11.08$	$(2.0 \times 35.81 \times 2.0) / (3.25 \times 2) = 22.06$	33.14
24.1	$4.26 \times 2.70 = 11.50$	$(2.1 \times 35.81 \times 2.1) / (3.25 \times 2) = 24.32$	35.82
24.25	$4.26 \times 2.85 = 12.14$	$(2.25 \times 35.81 \times 2.25) / (3.25 \times 2) = 27.91$	40.05
25.25	$4.26 \times 3.85 = 16.40$	$(3.25 \times 35.81 \times 3.25) / (3.25 \times 2) = 58.24$	74.64

*The stage-storage curve is extended to 25.25' NGVD for theoretical purposes only.

No flooding higher than the minimum floor elevation of 24.75' NGVD will be allowed.



Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

<see attached Appendix B for Stage-Storage Curve>

C. Control Structure Weir Crest Elevation

1. Existing control structure weir crest elevation = 23.5 ft. NGVD

D. Check the control structure detention discharge weir

1. Existing Information:

- a. A 6" diameter orifice is used.
- b. The size of the orifice should be such that discharge does not exceed 0.5 in. of the detained volume per day.

2. Computations:

- a. Volume to be discharged per day
 - = 0.5 in x (total site area - pond area)
 - = 0.5 in x (44.15 ac - 4.26 ac) x (1 ft. / 12 in.)
 - = 1.66 ac-ft maximum volume to be discharged per day

- b. Weir is broad crested and three (3) linear feet long.

E. Check allowable peak discharge weir.

1. Allowable discharge is 37 csm.
 - = 0.06 cfs/ac x 44.15 ac
 - = 2.649 cfs allowable discharge for basins 2, 4, and 6

2. Check soil storage for the developed site.

- a. Compute impervious for soil storage

Ponds (100%)	=	4.26 ac
+ Buildings (100%)	=	4.08
+ Roads & Parking (100%)	=	11.80
Total		<u>20.14</u> ac of impervious

- b. Compute pervious acreage for soil storage

$$\begin{aligned}
 &= \text{Total acreage} - \text{Impervious acreage} \\
 &= 44.15 \text{ ac} - 20.14 \text{ ac} \\
 &= \underline{24.01} \text{ ac of pervious}
 \end{aligned}$$

- c. Compute depth to average wet season water table

$$\begin{aligned}
 &= \text{Average finished site grade elevation} - \text{avg. wet season water table elevation} \\
 &= 23.7 \text{ ft NGVD} - 21.4 \text{ ft NGVD}
 \end{aligned}$$

Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

= 2.3 ft

d. Per ERP Informational Manual, Vol. IV, 2014, Part III Design Aids and Design Examples; to determine available soil moisture storage:

- i. For these typical soils, depth of storage available 2.3 ft., per Design Aids, Water Storage Section on pg. F-1. See attachment D.
- ii. Apply 25% reduction due to compaction during construction
- iii. From Table on page F-1 (see attachment D), the estimated amount of water which can be stored under pervious areas after development is 1.88 in.

e. Compute composite site soil moisture storage (S)

$$\begin{aligned}
 &= (\text{pervious acres/total site areas}) \times \text{soil storage available under pervious areas.} \\
 &= (24.01 \text{ ac}/44.15 \text{ ac}) \times 1.88 \text{ in} \\
 &= \underline{1.02} \text{ in. of soil storage available over the Basins 2, 4, \& 6.}
 \end{aligned}$$

3. Determine the maximum possible stage (zero discharge) during a design storm (25-year, 72-hour event.)

a. Total Rainfall (P) = 9.8 inches Value from previous permit calculations (Attachment C, Fig C-8)

b. Calculate total runoff in inches (Q)

$$\begin{aligned}
 &= (P - 0.2S)^2 / (P + 0.8S) \\
 &= (9.8 \text{ in} - 0.2 \times 1.02 \text{ in})^2 / (9.8 \text{ in} + 0.8 \times 1.02 \text{ in}) \\
 &= (9.596)^2 / 10.616 \\
 &= \underline{8.67} \text{ in. of total runoff (Q)}
 \end{aligned}$$

c. Calculate total runoff volume

$$\begin{aligned}
 &= Q \times \text{Project Acreage} \\
 &= 8.67 \text{ in.} \times 44.15 \text{ ac} \times (1 \text{ ft.}/12 \text{ in.}) \\
 &= \underline{31.90} \text{ ac-ft of runoff}
 \end{aligned}$$

d. From the stage-storage curve (attachment B), the zero discharge stage of the 25-yr, 72-hr storm is 23.94 ft. NGVD.

4. Existing control structures discharge data

a. Compute discharge elevations for control structure

i. Invert elevation of 6 in. diameter bleeder orifice = 21.4 ft. NGVD

ii. Crest elevation of 3.0 ft broad crest weir = 23.5 ft. NGVD

F. Check the proposed minimum building floor elevation.

1. Per ERP Info. Manual, Vol. IV, 2014, Basis of Review, Section 6.6.4, pg 78 the minimum building floor elevation shall be at least as high as the 100-year, 72-hour storm zero discharge runoff. The existing building floor elevation is



Project: Lee County Solid Waste Facility	Computed: ZJA	Date: 6/25/2019
Subject: Stormwater Calculations	Checked:	Date:
Task:	Sheet:	Of: 9

at 24.75 ft. NGVD for the WTE existing buildings.

2. Compute 100-year, 72-hour zero discharge runoff volume.

a. Total rainfall (P) was given to be **12.2 in.** Value from previous permit calculations (Attachment C , Fig C-9)

b. Calculate total runoff in inches (Q).

$$= (P - 0.2S)^2 / (P + 0.8S)$$

$$= (12.2 \text{ in} - 0.2 \times 1.02 \text{ in})^2 / (12.2 \text{ in} + 0.8 \times 1.02 \text{ in})$$

$$= \textbf{11.06 in. of total runoff (Q)}$$

c. Calculate total runoff volume

$$= Q \times \text{Project Acreage}$$

$$= 11.06 \times 44.15 \text{ ac} \times (1 \text{ ft}/12 \text{ in})$$

$$= \textbf{40.69 ac-ft of runoff}$$

d. From the stage-storage curve (Attachment B), the zero discharge stage of the 100-year, 72-hour storm is 24.27 ft. NGVD

e. The existing finish floor elevation is 24.75 ft NGVD is set higher than the 100-yr, 72-hr storm zero discharge stage of 24.27 ft. NGVD.

Therefore the design is adequate.

G. Check the proposed minimum road elevation.

1. Per ERP Info. Manual IV 2014, Basis of Review, Section 6.6.4, pg 78, the minimum road elevation shall be at least as high as the routed 10-year, 24-hour storm event. The existing minimum road elevation is the 23.80 ft. NGVD.

2. The routed 10-year, 24-hour storm peaked at elevation 23.47 ft. NGVD.

(See ICPR results in Attachment F)

That is lower than the existing minimum road elevation of 23.80 ft. NGVD.

Therefore the existing minimum road elevation is adequate.

H. Check allowable peak discharge.

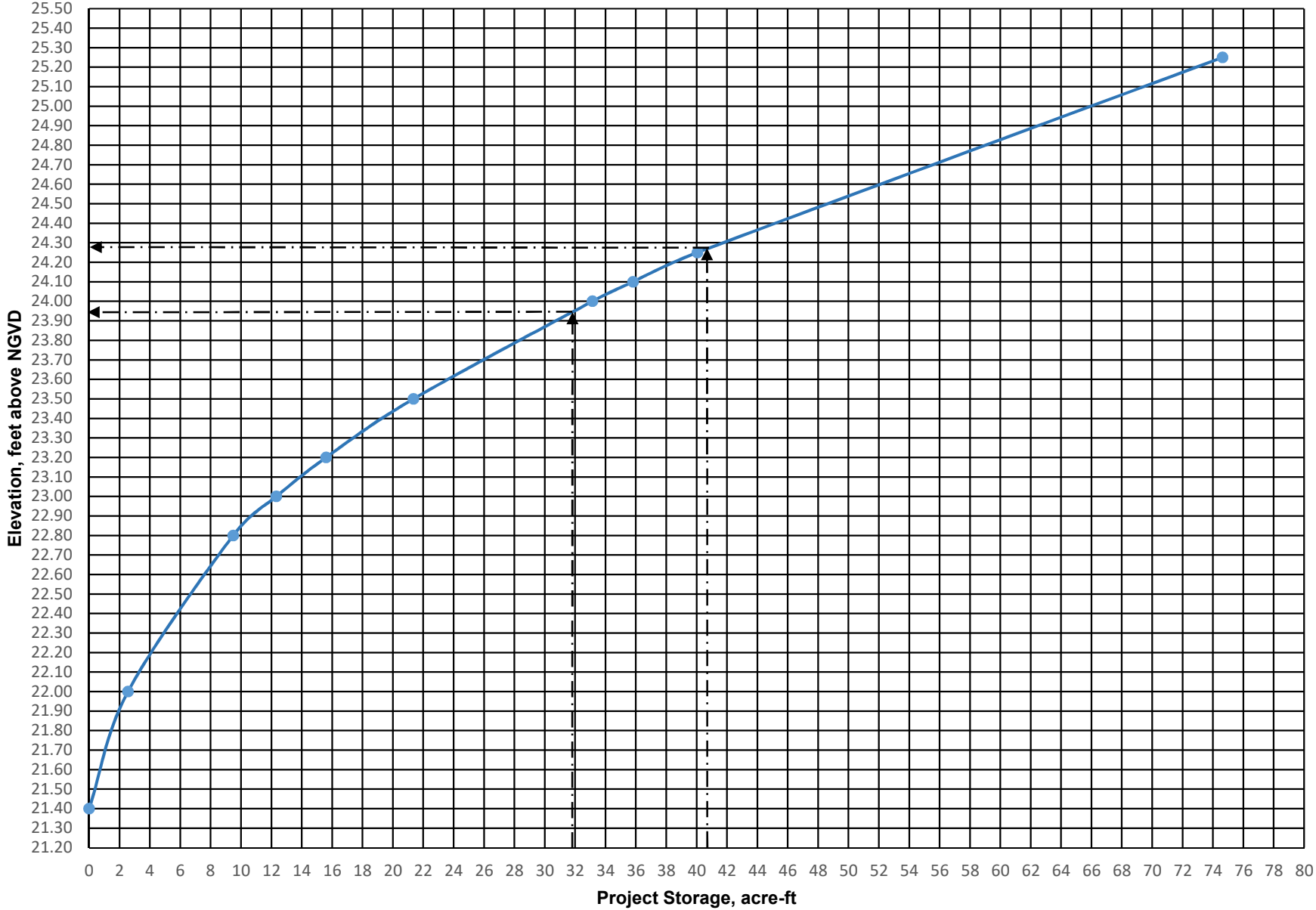
1. The allowable discharge rate was previously computed to be 37 csm, or approximately 2.65 cfs.

2. The routed 25-year, 72-hour event peaked at **1.88 cfs < 2.65 cfs.**

ATTACHMENT B

STAGE STORAGE CURVE
- BASINS 2, 4, AND 6

Stage Storage Curve - Basins 2, 4, & 6



ATTACHMENT C

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CALCULATION SUMMARY
& CONTROL SHEET
Page 1 of 2

CALCULATION SET NO.

7102-C-SWM-001

PRELIM.	FINAL	VOID	REVISION
X			X 2

DISCIPLINE CIVILJ.O. 7102.001PROJECT TITLE LEE COUNTY FACILITYSTRUCTURE OF SYSTEM SITE-WIDE DESIGN CLASSIFICATION N/A

RECEIVED

SUBJECT STORM/SURFACE WATER MANAGEMENT

JAN 04 1993

COMPLETED BY CARMEN D'ANGELO DATE 7/29/92

D.E.A. SOUTH DISTRICT

CHECKED BY Heone Trough/whu DATE 7/31/92

APPROVED BY _____ DATE _____

SDE OR MGR OF STAFF GROUP

REASON FOR REVISION: ORIGINAL ISSUE, REV. 0:TOTAL NUMBER OF SHEETS
IN THIS ISSUE 35SHEETS REVISED, ADDED OR
DELETED 4, REV. 1

REV. 1 - CHANGED CONTROL ELEVATION TO ELEVATION 21.40' NGVD & TOP OF BERM ELEVATION TO 24.00' NGVD. ADDED BASIN 1 25-YEAR, 5-DAY STORM ROUTING SHEETS. SEE ATTACHMENT D FOR NEW CONTROL ELEVATION VERIFICATION. A CHANGE FLOOR EL. TO 24.26 NGVD.

PROBLEM STATEMENT: DETERMINE A SPECIFIC DESIGN FOR STORM/SURFACE WATER MANAGEMENT IN ACCORDANCE WITH STATE OF FLORIDA SOUTH FLORIDA WATER MANAGEMENT DISTRICT (SFWMD) REGULATIONS, LEE COUNTY/OGDEN MARTIN CRITERIA & SITE SPECIFIC DESIGN REQUIREMENTS OF SITE CERTIFICATION APPLICATION (CASE No. 90-3942 EPP). A PORTION OF THIS PROJECT SITE IS PROPOSED FOR WET DETENTION (BASIN 1) & ANOTHER PORTION WET RETENTION (BASIN 2)

SUMMARY/CONCLUSIONS: SECTION A OF ATTACHED SHEETS GIVES SITE DATA & DESIGN CRITERIA, SECTION B CONSISTS OF COMPUTATIONS FOR A DETENTION SYSTEM (BASIN 1) & A TOTAL RETENTION SYSTEM (BASIN 2) AND ATTACHMENTS A, B & C GIVE THE 10, 25 & 100-YEAR ROUTING RESULTS FOR EACH BASIN & STAGE-DISCHARGE RELATIONSHIPS. THE FOLLOWING TABLE SUMMARIZES THE ROUTING:

STORM EVENT	BASIN 1		BASIN 2	
	STAGE*	DISCHARGE	STAGE*	DISCHARGE
10-YEAR	23.31'	0.31 CFS	23.31'	0 CFS
25-YEAR	23.92'	0.36 CFS	23.99'	0 CFS
100-YEAR	24.20'	1.30 CFS	24.26'	0 CFS**
* AS 1929 NGVD			** ADJACENT LANDS FLOODED	

CALCULATION SUMMARY
& CONTROL SHEET
Page 2 of 2

CALCULATION SET NO.

7102-C-SWM-001

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PROJECT TITLE LEE COUNTY FACILITY

DESIGN BASIS: PER SFWMD REGULATIONS, MINIMUM DESIGN AS FOLLOWS: ROADS @ 10-YR., 24-HR. EVENT, DESIGN @ 25-YR., 72-HR. EVENT & FLOODS @ 100-YR., 72-HR. EVENT STORMS. ALLOWABLE DETENTION AREA (BASIN 1) DISCHARGE IS 37 CSM (CFS/SQ. MI. OF AREA) OR 1.83 CFS TO PROJECT SITE LOCATION JURISDICTIONAL WETLANDS. NO FLOWS FROM OR ONTO OFF-SITE AREAS ARE CONSIDERED. CONTROL ELEVATION IS 21.4' NGVD. QUALITY DESIGN CRITERIA IS THE GREATER OF FIRST INCH OF RUNOFF OR 2.5 INS. TIMES % IMPERVIOUSNESS. POND STORAGE BEGINS @ ELEV 21.4' NGVD & IS VERTICAL OVER SURFACE AREA. SITE STORAGE IS LINEAR STARTING @ ELEV 22.0' NGVD. PERIMETER GRADING INCLUDES AN EARTH BERM W/ TOP ELEV. 24.00' NGVD.

UNVERIFIED ASSUMPTIONS/OPEN ITEMS: NONE.

REFERENCES: (SPECIFICATIONS, DRAWINGS, CODES, CALCULATIONS, TEXTS, REPORTS, COMPUTER DATA, FSAR, ETC.)

DRAWINGS: UE & C # E110000 - CIVIL PLOT PLAN
AGNOLI, BARBER & # 2838 BOUNDARY SURVEY
BRUNDAGE # 2902 TOPOGRAPHIC SURVEY
INK ENGINEERING # 9133 SITE SPECIFIC SURVEY
- WETLANDS

MANUAL: SFWMD, PERMIT INFORMATION MANUAL, V. IV

SITE CERTIFICATION: CASE NO. 90-3942 EPP, STATE
DOCUMENT OF FLORIDA.

Joseph M. Benvenuto
045454
10/19/92

Joseph M. Benvenuto
045454
11/12/92
REVISION 2

UNITED ENGINEERS AND CONSTRUCTORS
COMPUTER DISCLOSURE SHEET
DISCIPLINE CIVILCLIENT - OGDEN MARTIN / LEE COUNTYDATE 7/29/92PROJECT - LEE COUNTY FACILITYJOB NO. 7102.001PROGRAM(S) USED SCS REV. NO. 1REV. DATE 5/8/84CALC. SET 7102-C-SWM-001STATUS PRELIM. ☒FINAL ☐VOID ☐UE&C PREQUALIFICATION YES ☐NO ☒(SFWMD APPROVED & DISTRIBUTED SCS PROGRAM) 

RUN NO.

DESCRIPTION

ANALYSIS DESCRIPTION REVIEWER EDITION OF SFWMD SOILS CONSERVATION SERVICE (SCS) PROGRAM TO EXECUTE STORM/STAGE ROUTING CALC'S.THE ATTACHED COMPUTER OUTPUT HAS BEEN REVIEWED, THE INPUT DATA CHECKED,
AND THE RESULTS APPROVED FOR RELEASE, INPUT CRITERIA FOR THIS ANALYSIS WERE ESTABLISHEDBY C.D'ANGELO ON 7/29/92RUN BY C.D'ANGELO CJDCHECKED BY Glenn Tronolone

APPROVED BY _____

REMARKS

 REV. 1 TO CALCULATION SHEETS CHANGES COMPUTER STORM ROUTING PER CHANGE IN CONTROL ELEVATION.

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CALCULATION SET NO. 7102-C-SWM-001			REV.	COMP. BY	CHK'D. BY
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SHEET 1 OF 22			1	CJD DATE 8/18/92	I.M.T. DATE 8/25/92
J.O. 7102.001					

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

- A. DESIGN NEW FACILITY FOR BOTH RETENTION AND DETENTION SYSTEMS AS INDICATED ON UE&C PLOT PLAN DRAWING #7012-E-110000, Δ REV. 0, DATED 8/24/92 AND THE FOLLOWING DATA:
1. SITE LOCATION: BUCKINGHAM ROAD NEAR STATE ROUTE 82, LEE COUNTY, FL, SECTION 24 IN TOWNSHIP 44 SOUTH, RANGE 25 EAST.
 2. SITE ZONING: INDUSTRIAL PLANNED DEVELOPMENT (IPD)
 3. SOILS & HIGH WATER TABLE: SURFICIAL STRATUM OF LOOSE FINE SANDS (SP) UNDERLAIN BY INTERMITTENT STRATUM OF CLAYEY SANDS (SC/SM) & SOME WEATHERED/FRACTURED LIMESTONE. SEASONAL HIGH GROUNDWATER LEVEL OCCURS DURING LATE SUMMER MONTHS & IS ABOUT 6 INS. Δ ABOVE EXISTING GROUND SURFACE. SEE CAMP, DRESSER & McKEE, INC. REPORT, "LEE COUNTY - APPLICATION FOR POWER PLANT CERTIFICATION."
 4. TOTAL SITE, PARCELS: 324.45 ACRES PER BOUNDARY SURVEY BY AGNOLI, BARBER & ARUNDAGE, INC. DRAWING #2838 DATED

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 SUBJECT SURFACE WATER MANAGEMENT

CALCULATION SET NO. <u>7102-C-SWM-001</u>			REV.	COMP. BY	CHK'D BY
PRELIM. X	FINAL	VOID	0	<u>CJD</u> DATE <u>7/17/92</u>	<u>I.M.T.</u> DATE <u>7/31/92</u>
SHEET <u>2</u> OF <u>22</u>			1	<u>CJD</u> DATE <u>8/19/92</u>	<u>I.M.T.</u> DATE <u>8/25/92</u>
J.O. <u>7102.001</u>					

MAY 31, 1990.

5. DEVELOPED AREAS: (46.4 ACS. TOTAL)

<u>SURFACE</u>	<u>BASIN 1</u> (SOUTH)	<u>BASIN 2</u> (NORTH)
a - IMPERVIOUS		
BUILDINGS (ROOF)	1.6	1.3
ROADS & PARKING	4.7	1.0
b. WATER MANAGEMENT AREA	4.3	2.3
△ c. PERVIOUS	<u>21.0</u> *	<u>10.2</u>
TOTAL, ACS.	31.6	14.8

6. ALLOWABLE DISCHARGE: PROJECT IS SITUATED

IN LEE COUNTY C-43 DRAINAGE BASIN WHERE THE SITE CERTIFICATION APPLICATION (AS CASE No. 90-3942 EPP) ESTABLISHES THE PEAK DISCHARGE (POST-DEVELOPMENT BASIS) AS NOT EXCEEDING 37 CSM (CFS/SQUARE MILE OF AREA) FOR THE 25-YEAR, 72-HOUR DESIGN STORM EVENT. SEE ATTACHMENTS 1 & 2 FOR SITE SPECIFIC DESIGN REQUIREMENTS LISTING ALLOWABLE DISCHARGE, AUTHORIZED DISCHARGE FACILITIES & RECEIVING WATER AS WELL

 △ * INCLUDES 0.8 AC.
ARCHITECTURAL POND

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CALCULATION SET NO. 7102-SWM-001			REV.	COMP. BY	CHK'D BY
PRELIM. X	FINAL	VOID	0	CJD DATE 7/17/92	I.M.T. DATE 7/31/92
SHEET 3 OF 22			1	CJD DATE 8/18/92	IMT DATE 8/25/92
J.O. 7102.001					

PROJECT LEE COUNTY FACILITY

SUBJECT SURFACE WATER MANAGEMENT

AS CONTROL ELEVATION. NO FLOWS FROM OR ONTO
OFF-SITE AREAS ARE CONSIDERED FOR EVENTS UP TO
25-YEAR, 3-DAY DURATION.

7. WATER LEVEL ELEVATIONS:

⚠ - WET SEASON HIGH GROUNDWATER = EL. 21.4' NGVD
(CONTROL ELEVATION)

⚠ - RECEIVING WATER ELEV.: 21.7' NGVD

8. DESIGN STORM RAINFALL AMOUNTS:

a. ROADS @ 10-YEAR, 24-HOUR = 6.0" DEPTH
EVENT

b. DESIGN @ 25-YEAR, 72-HOUR = 7.2" @ 24-HRS.
EVENT $\times 1.359$
= 9.8" DEPTH

c. FLOORS @ 100-YEAR, 72-HOUR = 9.0" @ 24-HRS.
EVENT $\times 1.359$
= 12.2" DEPTH

SEE ATTACHMENTS 3, 4 AND 5 FROM SFWMD
MANUAL (VOL. IV) FOR 1-DAY RAINFALL (P₂₄)
DATA.

9. DESIGN CRITERIA, QUALITY:

a. FOR WET DETENTION SYSTEM, THE GREATER
OF FIRST INCH OF RUNOFF FROM DETEN-
TION AREA OR THE AMOUNT OF 2.5 INCHES
 $\times$ PERCENTAGE IMPERVIOUSNESS.

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CALCULATION SET NO.			REV.	COMP. BY	CHK'D BY
7102-C-SWM-001			0	CJD	I.M.T
PRELIM.	FINAL	VOID		DATE	DATE
X				7/17/92	7/31/92
SHEET 4 OF 22			1	CJD	I.M.T
J.O. 7102.001				DATE	DATE
				8/18/92	8/25/92
			2	CJD	I.M.T
				DATE	DATE
				11/9/92	11/11/92

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

b. FOR THE RETENTION SYSTEM, SAME AS a.
ABOVE WITH 50% VOLUME REDUCTION.

10. DESIGN CRITERIA, QUANTITY:

- a. ROADS - $\&$ 'S NO LOWER THAN BUCKINGHAM RD. $\&$
EL. 23.8' NGVD. $\&$ MINIMUM 2- FEET ABOVE THE
CONTROL ELEVATION ($21.4'$ NGVD + 2.0' = EL.
 $23.4'$ NGVD MINIMUM).
- b. FLOORS - FIRST FLOOR ELEVATION NO LOWER
THAN EL. $24.26'$ NGVD, $\&$ BASED ON 100-YR. EVENT.
- c. WET DETENTION DISCHARGE ALLOWABLE IS
37 CSM FOR A 25-YEAR, 72-HOUR STORM.

11. PRETREATMENT: PROVIDE 0.5 INCH PRETREAT-
MENT FOR WET DETENTION AREA ONLY.

12. PROJECT SURFACE STORAGE:

- a. POND STORAGE COMMENCES AT EL. $21.4'$ NGVD
WHICH IS THE CONTROL ELEVATION FOR EACH
OF BASINS 1 $\&$ 2, $\&$ ENDS AT EL. $22.0'$ NGVD.
- b. POND STORAGE IS VERTICAL OVER THE POND
SURFACE AREA.

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CALCULATION SET NO.			REV.	COMP. BY	CHK'D. BY
7102-C-SWM-001			0	CJD	I.M.T
PRELIM.	FINAL	VOID		DATE	DATE
X				7/17/92	7/31/92
SHEET 5 OF 22			1	CJD	I.M.T
J.O.	7102.001			DATE	DATE
				8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

- △ C. SITE STORAGE IS LINEAR STARTING AT EL. 22.0' NGVD, WHICH ALLOWS FOR EMBANKMENTS IN VOLUME CALCULATIONS.
- d. PERIMETER GRADING PROVIDES FOR THE CONSTRUCTION OF AN EARTHEN CONTAINMENT BERM SYSTEM (WITH A TOP ELEVATION OF 24.0' NGVD, WHICH WILL BE HIGHER THAN THE PEAK STAGE OF THE 25-YEAR, 72-HOUR DESIGN STORM).

B. COMPUTATIONS FOR RETENTION & DETENTION SYSTEMS - BASINS 1 & 2

1. BASIN 2 - TOTAL RETENTION ON-SITE

a. QUALITY - FIRST INCH OF RUNOFF FROM THE DEVELOPED PROJECT:

$$= (1") (1 \text{ FT.} / 12") (14.8 \text{ AC.}) = 1.2 \text{ AC-FT. FOR FIRST INCH OF RUNOFF}$$

- 2.5" x PERCENTAGE IMPERVIOUSNESS:

$$= \text{RETENTION AREA} - (\text{POND AREAS} + \text{ROOF AREAS})$$

$$= 14.8 \text{ ACS.} - (2.3 \text{ AC.} + 1.3 \text{ AC.})$$

$$= \underline{11.2 \text{ AC. FOR RETENTION AREA WATER QUALITY PVIOUS/IMPVIOUS}}$$

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CALCULATION SET NO. 7102-C-SWM-001			REV. 0	COMP. BY CJD	CHK'D. BY I.M.T
PRELIM. X	FINAL	VOID	DATE 7/17/92	DATE 7/31/92	
SHEET 6 OF 22			DATE	DATE	
J.O. 7102.001					

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

- IMPERVIOUS AREA ONLY:

= (SITE AREA FOR WATER QUALITY PERVIOUS/
IMPERVIOUS - PERVIOUS)

= 11.2 AC. - 10.2 AC.

= 1.0 AC. OF IMPERVIOUS AREA FOR WATER
QUALITY PERVIOUS/IMPERVIOUS

- PERCENTAGE OF IMPERVIOUSNESS FOR
WATER QUALITY:

= (1.0 AC. / 11.2 AC.) $\times$ 100% = 8.9%

- FOR 2.5" $\times$ THE PERCENTAGE IMPERVIOUS
= (2.5") (8.9%) = 0.2" TO BE TREATED

- VOLUME REQUIRED FOR QUALITY DETENTION:

= 0.2" (14.8 AC. - 2.3 AC.) (1' / 12")

= 0.2 AC.-FT. REQUIRED STORAGE

- FIRST INCH OF RUNOFF = 1.2 AC.-FT.
CONTROLS (> 0.2 AC.-FT. FOR
QUALITY STORAGE)

- USE 50% VOLUME REDUCTION FOR A RETEN-
TION SYSTEM:

REQUIRED STORAGE = (1.2 AC.-FT.) $\frac{1}{2}$ = 0.6
AC.-FT.

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CALCULATION SET NO.			REV.	COMP. BY	CHK'D. BY
7102-C-SWM-001			0	CJD	I.M.T.
PRELIM.	FINAL	VOID		DATE	DATE
X				7/20/92	7/31/92
SHEET	7	OF 22	1	CJD	I.M.T.
J.O.	7102.001			DATE	DATE
				8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

$$\begin{aligned} & - \text{REQUIRED POND VOLUME} = \text{TOTAL REQUIRED} \\ & \text{STORAGE} - \text{PRETREATMENT} \\ & = 0.6 \text{ AC-FT.} - 0 = \underline{0.6 \text{ AC-FT.}} \end{aligned}$$

b. FIND RUNOFF VOLUME FOR 25- & 100-YEAR
STORM EVENTS IN RETENTION SYSTEM AREA:

1. COMPUTE DEPTH TO WATER TABLE = AVER-
AGE FINISHED SITE GRADE ELEVATION -
WET SEASON WATER TABLE ELEVATION



$$(23.5' \text{ NGVD} - 21.4' \text{ NGVD}) \approx 2 \text{ FT.}$$

2. USE 25% REDUCTION DUE TO SOIL COM-
PACTION DURING SITE DEVELOPMENT?

- FROM ATTACHMENT 6, DEVELOPED
AVAILABLE STORAGE IS 1.88".

3. COMPUTE S, SITE SOIL MOISTURE STORAGE:

$$= (\text{PERVIOUS ACRES} / \text{TOTAL SITE ACRES}) \times \text{SOIL STORAGE UNDER PERVIOUS AREAS}$$

$$(10.2 \text{ ACS.} / 14.8 \text{ ACS.}) (1.88'') = \underline{1.3''} = S$$

4. FIND MAXIMUM POSSIBLE STAGE AS ZERO
DISCHARGE DURING A 25-YEAR, 72-HOUR
& 100-YEAR, 72-HOUR EVENTS:

$$Q_{25} = (P - 0.25)^2 / (P + 0.85)$$

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COMPUTATION
SHEET

 PROJECT LEE COUNTY FACILITY
 SUBJECT SURFACE WATER MANAGEMENT

CALCULATION SET NO.			REV.	COMP. BY	CHK'D. BY
7102-C-SWM-001			0	CJD	L.M.T.
PRELIM.	FINAL	VOID		DATE	DATE
X				7/20/92	7/31/92
SHEET 8 OF 22			1	CJD	L.M.T.
J.O. 7102.001				DATE	DATE
				8/18/92	8/25/92

$$Q_{25} = (9.8'' - 0.2(1.3''))^2 / (9.8'' + 0.8(1.3''))$$

$$Q_{25} = 8.4'' \text{ RUNOFF}$$

$$\begin{aligned} \text{VOLUME} &= 8.4'' (14.8 \text{ AC.}) (1 \text{ FT.} / 12'') \\ &= \underline{10.4 \text{ AC.} - \text{FT. OF RUNOFF @ 25-YEAR EVENT}} \end{aligned}$$

$$Q_{100} = (P - 0.25)^2 / (P + 0.85)$$

$$Q_{100} = (12.2'' - 0.2(1.3''))^2 / (12.2'' + 0.8(1.3''))$$

$$Q_{100} = 10.8'' \text{ RUNOFF}$$

$$\begin{aligned} \text{VOLUME} &= 10.8'' (14.8 \text{ AC.}) (1 \text{ FT.} / 12'') \\ &= \underline{13.3 \text{ AC.} - \text{FT. OF RUNOFF @ 100-YEAR EVENT}} \end{aligned}$$

5. DEVELOP RETENTION AREA STAGE-STORAGE
CURVE:

STAGE (FT. NGVD)	BASIN 2		TOTAL (AC.-FT.)
	PONDS (AC.-FT.)	SITE (AC.-FT.)	

21.4

0

0

0

22

$$2.3 \times 0.6' = 1.4$$

0

1.4

23

2.3*

3.7

24

9.0*

10.4

25

$$2.3 \times 0.6' = 1.4$$

20.3*

21.7

* SEE SH. 10

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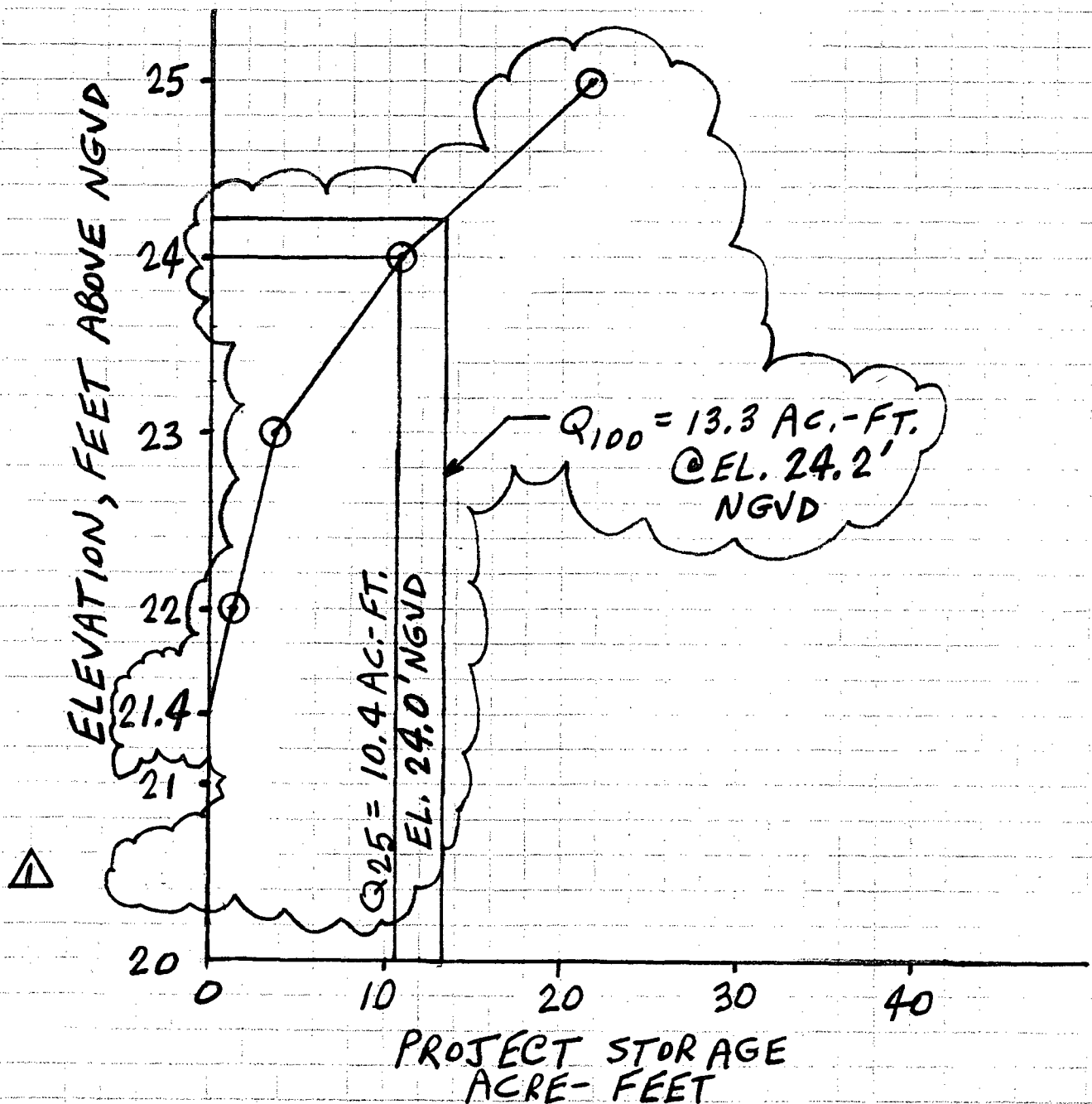
GENERAL
COMPUTATION
SHEET

CALCULATION SET NO.		
7102-C-SWM-001		
PRELIM.	FINAL	VOID
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SHEET 9 OF 22		
J.O. 7102.001		

REV.	COMP. BY	CHK'D BY
0	CJD	L.M.T.
	DATE	DATE
	7/17/92	7/31/92
1	CJD	L.M.T.
	DATE	DATE
	8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

BASIN 2
STAGE-STORAGE CURVE
FOR ZERO DISCHARGE CONDITION
RETENTION SYSTEM



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SHEET

CALCULATION SET NO.			REV.	COMP. BY	CHK'D. BY
7102-C-SWM-001			0	CJD	I.M.T
PRELIM.	FINAL	VOID		DATE	DATE
X				7/20/92	7/31/92
SHEET 10 OF 22			1	CJD	I.M.T
J.O. 7102.001				DATE	DATE
				8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

6. RETENTION AREA STORAGE = RETENTION AREA -
(BASIN 2) ROOF AREA

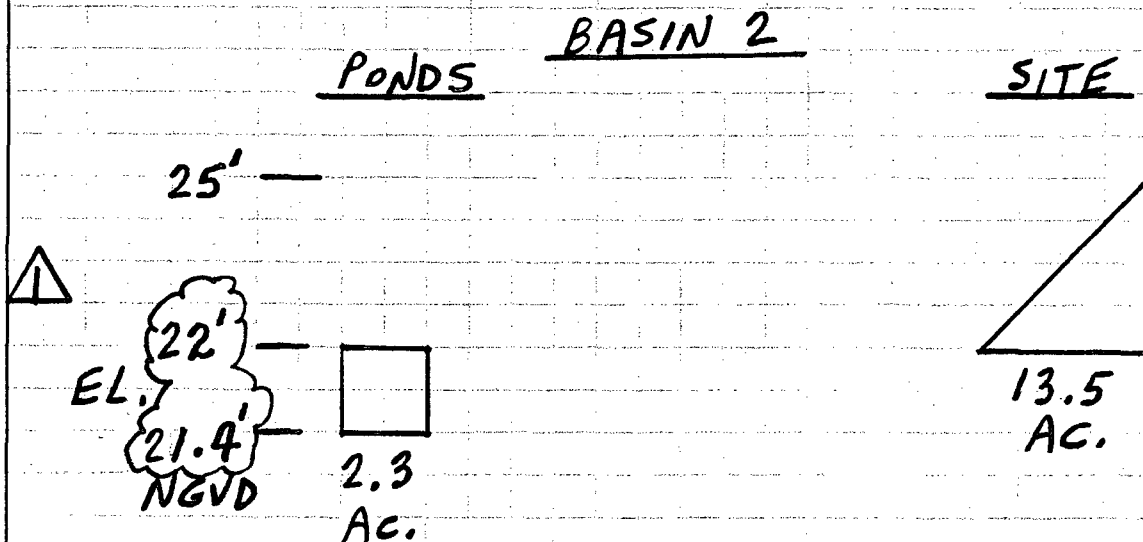
$$= 14.8 \text{ AC.} - 1.3 \text{ AC.}$$

$$= 13.5 \text{ AC.}$$

VOLUMES OF SITE STORAGE BY AVERAGE DEPTH
METHOD:

BASIN 2	STAGE, FT. NGVD	VOLUME, AC.-FT.
	23	$1/3 (13.5 \text{ AC.}) (1/2) = 2.3$
	24	$2/3 (13.5 \text{ AC.}) (2/2) = 9.0$
	25	$3/3 (13.5 \text{ AC.}) (3/2) = 20.3$

7. SITE (RETENTION) STORAGE DIAGRAM:



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GENERAL
COMPUTATION
SHEET

CALCULATION SET NO. 7102-C-SWM-001			REV. 0	COMP. BY CJD	CHK'D. BY I.M.T
PRELIM. X	FINAL	VOID		DATE 7/20/92	DATE 7/31/92
SHEET 11 OF 22				DATE	DATE
J.O. 7102.001					

PROJECT **LEE COUNTY FACILITY**
SUBJECT **SURFACE WATER MANAGEMENT**

2. WET DETENTION SYSTEM - BASIN 1

a. QUALITY - FIRST INCH OF RUNOFF:

$$= (1") (1 \text{ FT.} / 12") (31.6 \text{ AC.}) = 2.6 \text{ AC. - FT. FOR FIRST INCH OF RUNOFF}$$

- 2.5" (% IMPERVIOUSNESS):

$$= \text{DETENTION AREA} - (\text{POND SURFACE} + \text{ROOF AREAS})$$

$$= 31.6 \text{ AC.} - (4.3 \text{ ACS.} + 1.6 \text{ AC.})$$

$$= \underline{25.7 \text{ AC. FOR DETENTION AREA WATER QUALITY PERVIOUS/IMPERVIOUS}}$$

- IMPERVIOUS AREA ONLY:

$$= (\text{SITE AREA FOR WATER QUALITY PERVIOUS/IMPERVIOUS} - \text{PERVIOUS})$$

$$= 25.7 \text{ AC.} - 21.0 \text{ AC.}$$

$$= 4.7 \text{ AC. OF IMPERVIOUS AREA FOR WATER QUALITY PERVIOUS/IMPERVIOUS}$$

- PERCENTAGE OF IMPERVIOUSNESS FOR WATER QUALITY:

$$= (4.7 \text{ AC.} / 25.7 \text{ AC.}) \times 100\% = 18.3\%$$

- FOR 2.5" x THE PERCENTAGE IMPERVIOUS:

$$= 2.5" (18.3\%) \approx 0.5" \text{ TO BE TREATED}$$

- VOLUME REQUIRED FOR QUALITY DETENTION:

$$= 0.5" (31.6 \text{ AC.} - 4.3 \text{ AC.}) (1' / 12") \approx 1.1 \text{ AC. - FT.}$$

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PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

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PRELIM. X	FINAL	VOID		DATE <u>7/21/92</u>	DATE <u>7/31/92</u>
SHEET <u>12</u> OF <u>22</u>				DATE	DATE
J.O. <u>7102.001</u>					

- FIRST INCH OF RUNOFF = 2.6 AC.-FT.
CONTROLS (> 1.1 AC.-FT. FOR
QUALITY DETENTION)

- COMPUTE 1/2" OF PRETREATMENT:
= 1/2" (DETENTION AREA - POND AREAS)
= 1/2" (31.6 AC. - 4.3 AC.) (1'/12") ≈ 1.1 AC.-FT.

- COMPUTE REQUIRED POND VOLUME, MIN. :
= TOTAL REQUIRED DETENTION - PRETREATMENT
= 2.6 AC.-FT. - 1.1 AC.-FT.
= 1.5 AC.-FT. MIN. POND VOLUME

b. FIND RUNOFF VOLUME FOR 25 - & 100-YEAR
STORM EVENTS FOR DETENTION SYSTEM (BASIN 1):

1. USE CRITERIA & SOIL MOISTURE STORAGE
CALCULATION BASIS AS GIVEN ON SH.7, b.:
$$S = (21.0 \text{ AC.} / 31.6 \text{ AC.}) (1.88") = \underline{1.2"}$$

2. FIND MAXIMUM POSSIBLE STAGE AS ZERO
DISCHARGE DURING A 25-YEAR & 100-YEAR,
72-HOUR EVENTS:

$$Q_{25} = (P - 0.2S)^2 / (P + 0.8S)$$

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PRELIM.	FINAL	VOID		DATE	DATE
X				7/21/92	7/31/92
SHEET	13	OF 22	1	CJD	L.M.T
J.O.	7102.001			DATE	DATE
				8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY

SUBJECT SURFACE WATER MANAGEMENT

$$Q_{25} = (9.8'' - 0.2(1.2''))^2 / (9.8'' + 0.8(1.2''))$$

$$Q_{25} = \underline{8.5'' \text{ RUNOFF}}$$

$$\text{VOLUME} = 8.5'' (31.6 \text{ AC.}) (1 \text{ FT.} / 12'')$$

$$= \underline{22.4 \text{ AC.-FT. OF RUNOFF @ 25-YEAR EVENT}}$$

$$Q_{100} = (P - 0.2S)^2 / (P + 0.8S)$$

$$Q_{100} = (12.2'' - 0.2(1.2''))^2 / (12.2'' + 0.8(1.2''))$$

$$Q_{100} = \underline{10.9'' \text{ RUNOFF}}$$

$$\text{VOLUME} = 10.9'' (31.6 \text{ AC.}) (1 \text{ FT.} / 12'')$$

$$= \underline{28.7 \text{ AC.-FT. OF RUNOFF @ 100-YEAR EVENT}}$$

3. DEVELOP DETENTION AREA STAGE-STORAGE CURVE:

STAGE (FT. NGVD)	BASIN 1		TOTAL (AC.-FT.)
	PONDS (AC.-FT.)	SITE (AC.-FT.)	
21.4	0	0	0
22	$4.3 \times 0.6' \approx 2.6$	0	2.6
23		5.0*	7.6
24		20.0*	22.6
25	$4.3 \times 0.6' = 2.6$	45*	47.6

* SEE SH. 15



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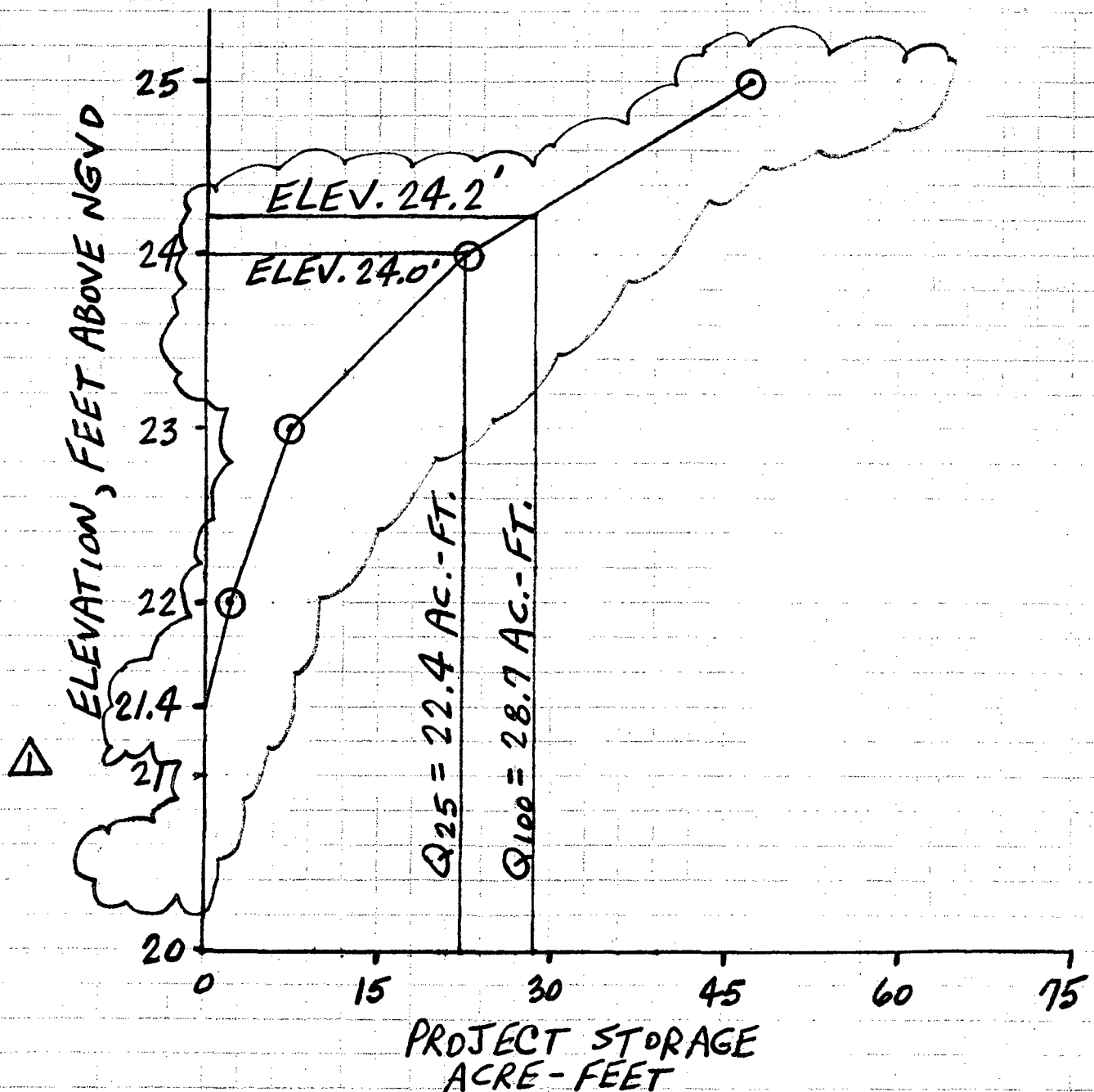
GENERAL
COMPUTATION
SHEET

CALCULATION SET NO.		
7102-C-SWM-001		
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X		
SHEET 14 OF 22		
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	DATE	DATE
	7/20/92	7/31/92
1	CJD	I.M.T.
	DATE	DATE
	8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

BASIN 1
STAGE-STORAGE CURVE
FOR ZERO DISCHARGE CONDITION
DETENTION SYSTEM



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SHEET 15 OF 22			1	CJD DATE 8/18/92	L.M.T DATE 8/18/92
J.O. 7102.001					

PROJECT **LEE COUNTY FACILITY**
SUBJECT **SURFACE WATER MANAGEMENT**

4. DETENTION AREA STORAGE = DETENTION AREA -
(AS BASIN 1) ROOF AREA

$$= 31.6 \text{ AC.} - 1.6 \text{ AC.}$$

$$= 30.0 \text{ AC.}$$

VOLUMES OF SITE STORAGE BY AVERAGE DEPTH
METHOD:

STAGE, FT. NGVD		VOLUME, AC.-FT.
BASIN 1 △	23	$\frac{1}{3}(30.0 \text{ AC.})(\frac{1}{2}) = 5.0$
	24	$\frac{2}{3}(30.0 \text{ AC.})(\frac{2}{2}) = 20.0$
	25	$\frac{3}{3}(30.0 \text{ AC.})(\frac{3}{2}) = 45$

5. DISCHARGE BASED ON 37 CSM CRITERIA:

$$D = \frac{37 \text{ CFS}}{\text{mi}^2} \left(\frac{\text{mi}^2}{640 \text{ AC.}} \right) (31.6 \text{ AC.}) \approx \frac{1.83 \text{ CFS}}{\text{PEAK}}$$

6. CIRCULAR ORIFICE DISCHARGE STRUCTURE
CALCULATION:

SIZE = 3" ϕ

INVERT ELEV. = 21.4' NGVD

FULL FLOW : $Q = CA\sqrt{2gH}$
CONDITION $C = 0.6$

(REVISED)
FROM
CERTIFICATION
DOCUMENT

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COMPUTATION
SHEET

CALCULATION SET NO. 7102-C-SWM-001		
PRELIM. X	FINAL	VOID
SHEET 16 OF 22		
J.O. 7102.001		

REV.	COMP. BY	CHK'D BY
0	CJD	I.M.T.
	DATE 7/21/92	DATE 7/31/92
1	CJD	I.M.T.
	DATE 8/19/92	DATE 8/25/92

PROJECT **LEE COUNTY FACILITY**

SUBJECT **SURFACE WATER MANAGEMENT**

7. BASIN 1 - STAGE-DISCHARGE DATA

	<u>STAGE</u> EL., FT. NGVD	<u>BLEEDER</u> (CFS)	<u>WEIR</u> (CFS)	<u>DISCHARGE</u> (CFS)
	20.5	0	0	0
	21.0	0	0	0
<u>DATUM EL.</u>	21.4	0	0	0
21.53'	22.0	0.16	0	0.16
	22.5	0.23	0	0.23
	23.0	0.29	0	0.29
	23.5	0.33	0	0.33
<u>TOP OF</u>	24.0	0.37	0	0.37
<u>BERM</u>	24.5	0.41	3.32	3.73
	25.0	0.44	8.02	8.46

WEIR: BROAD CRESTED, CREST EL. 24.1' NGVD,
3' WIDE, $Q = CLH^{1.5}$ WITH $C = 3.13$ OR
 $Q = 3.13 LH^{1.5}$

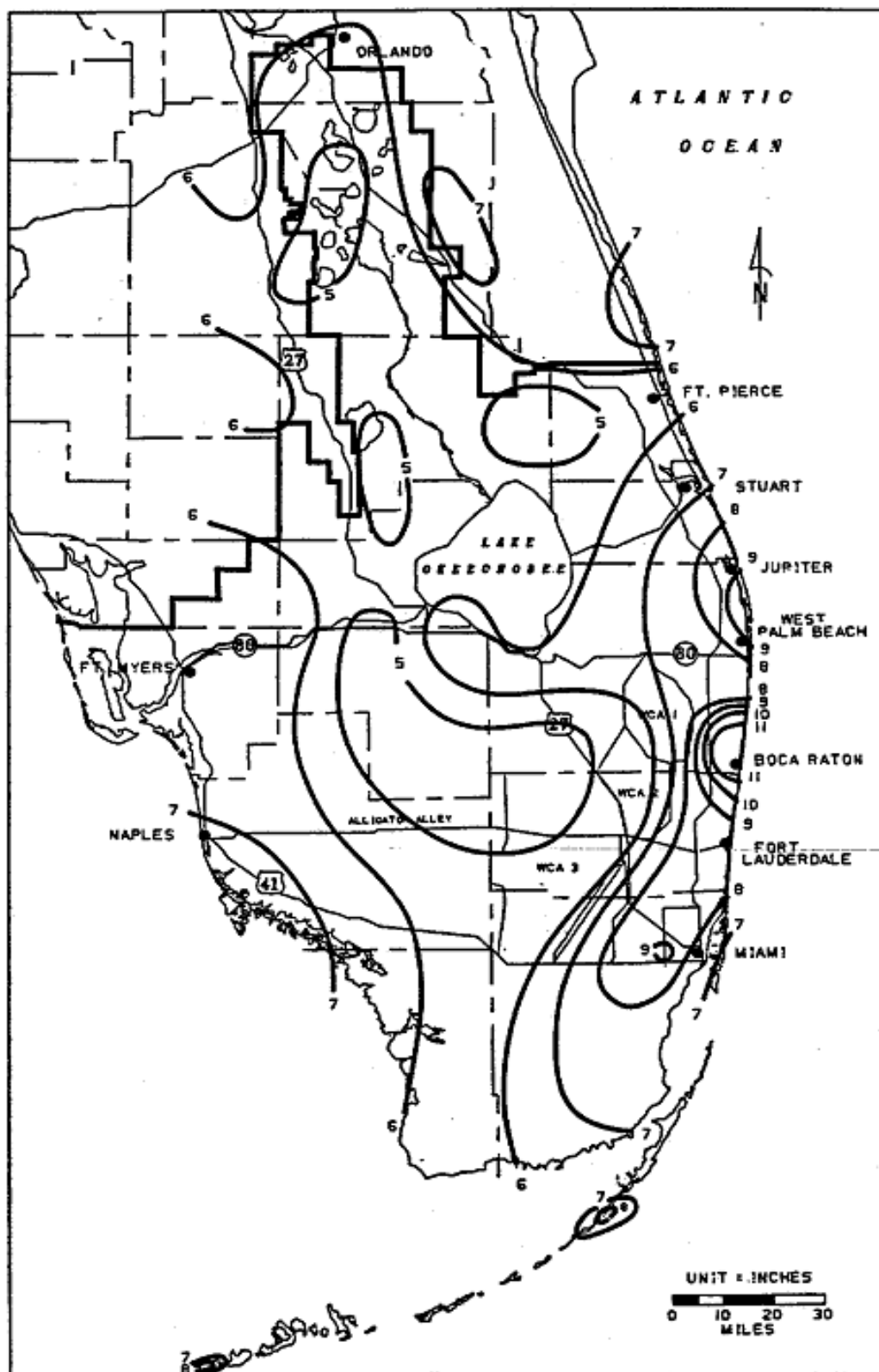


FIGURE C-4. 1-DAY RAINFALL: 10-YEAR RETURN PERIOD

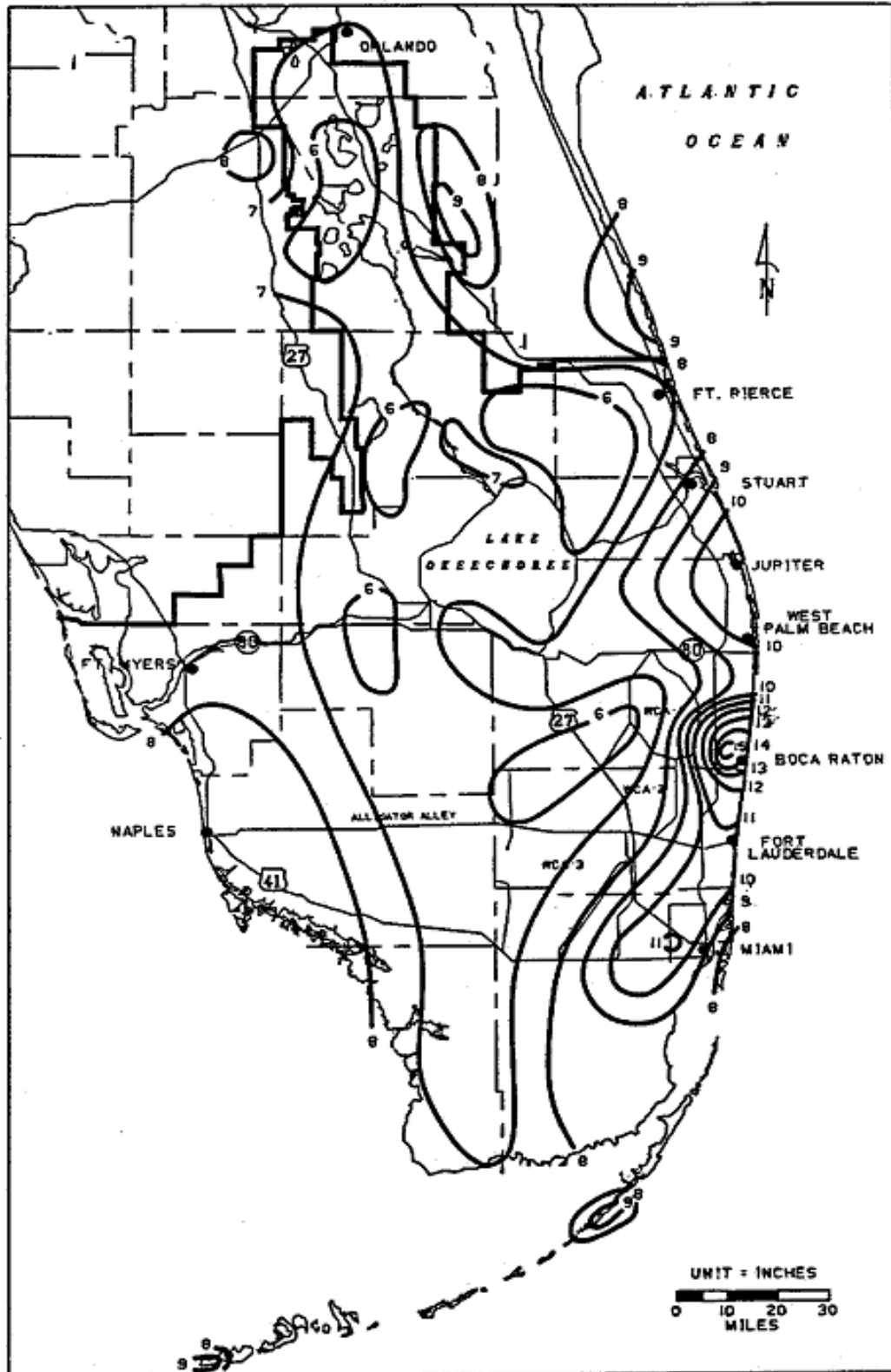


FIGURE C-5. 1-DAY RAINFALL: 25-YEAR RETURN PERIOD

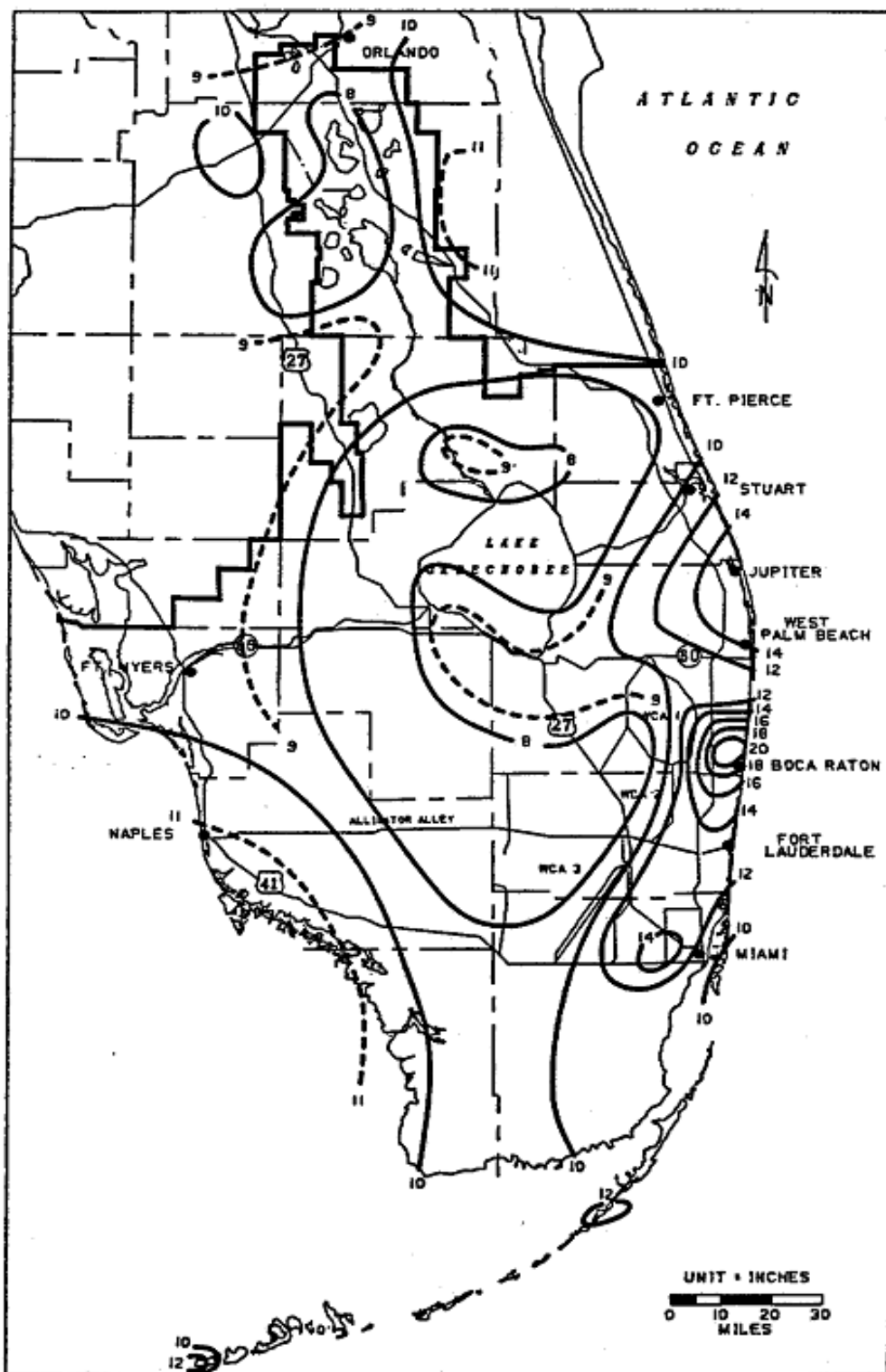


FIGURE C-6. 1-DAY RAINFALL: 100-YEAR RETURN PERIOD

5.7 REQUIRED DESIGN INFORMATION AND ASSUMPTIONS

5.7.1 Antecedent Conditions

Antecedent conditions shall be average wet season elevations for water table or other water surfaces.

5.7.2 Rainfall

Distributions and intensities should be consistent with one or more of these Reference Sources:

- (a) Appendix C of this Handbook, Isohyetal Maps from SFWMD Technical Memorandum, *Frequency Analysis of One and Three Day Rainfall Maxima for central and southern Florida*, Paul Trimble, October 1990, and the following distribution table:

Time (hours)	Cumulative Percentage of Peak One Day Rainfall
0	0
24	14.6
48	35.9
58	57.2
59	62.8
59.5	67.8
59.75	82.8
60	101.5
60.5	108.8
61	112.6
62	117.7
72	135.9

100% One Day
Rainfall

This percentage is multiplied by the 24-hour event to obtain the 72-hour event in the calculations proceeding this attachment.

- (b) Actual gage data analyzed by accepted statistical methods;

ATTACHMENT D

F. Water Storage

A. Ground Storage

- One of the requirements for dry retention/detention flood protection areas is that each shall have a "mechanism" for returning the water level to control elevation. In such situations, the term "mechanism" is normally interpreted to mean something designed, fabricated, and installed in or on the site. As a result, almost every such project will have something - a V-notch weir, exfiltration trench, key/mosquito ditch, sump, etc. - to provide the required drawdown.

Such devices may not always be necessary. If it can be shown that the soil itself allows the water table to subside in an acceptable length of time, then no "artificial" mechanism need be installed. The burden of proof is on the applicant, and District staff will not approve, or recommend for approval, a dry system which does not provide such mechanisms, be they natural or fabricated.

- The moisture storage capability (S) of the soil profile has been estimated by the United States Department of Agriculture – Natural Resource Conservation Service (USDA – NRCS; fka Soil Conservation Service [SCS]) for the soils found within the SFWMD boundaries. The total amount of water which can be stored in the soil profile expressed as a function of the depth to the water table* for these soils is:

<u>SOIL STORAGE</u>												
Depth to W.T.*	Coastal(1)				Flatwoods (2)				Depressional (3)			
	Uncomp. S (In.)	Uncomp. CN	Comp. S	Comp. CN	Uncomp. S (In.)	Uncomp. CN	Comp. S (In.)	Comp. CN	Uncomp. S (In.)	Uncomp. CN	Comp. S (In.)	Comp. CN
1	0.60	94	0.45	96	0.60	94	0.45	96	0.60	94	0.45	96
2	2.50	80	1.88	84	2.50	80	1.88	84	2.10	83	1.58	86
3	6.60	60	4.95	67	5.40	65	4.05	71	4.40	69	3.30	75
4	10.90	48	8.18	55	9.00	53	6.75	60	6.80	60	5.10	66

*Typically, the Seasonal High Water Table. Consult with District staff regarding site-specific situations and questions.

- Sandy soils 0 - 40" thick with water tables dropping below 40" - St. Lucie series is representative
- Water tables 15" - 40" - Immokalee series is representative
- Water tables above ground - 15" - Riviera and Pompano series are representative

The compacted values represent the cumulative water storage values reduced by 25 percent to account for the reduction in void spaces due to the compaction which occurs incidental to earthwork operations. An example of the use of this information is:

Assume the following:

Average Finished Grade = 17.0 feet NGVD

Average Ground Water* Level = 14.0 feet NGVD

Percent of Project in Lakes = 15%

Percent of Project Impervious = 35%

Coastal Soil Type (compacted)

ATTACHMENT E

HDR

HDR Engineering, Inc.
5435 BayCenter Dr, Ste. 400
Tampa, FL 33609-3444
(813) 282-2200
CA00004213

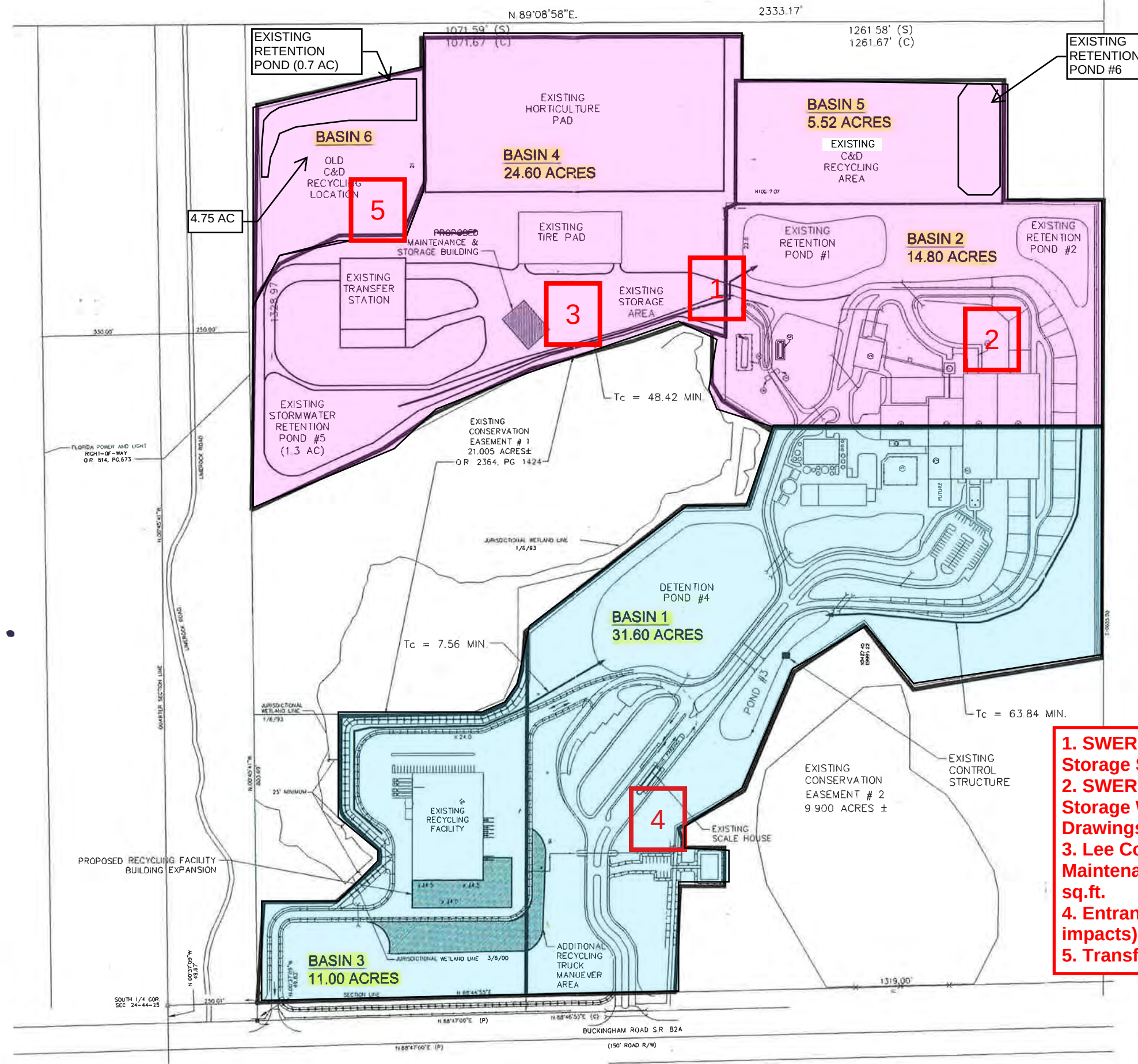


FIGURE 6
Basin Delineation / Site Plan
Lee County Solid Waste Energy Recovery Facility (SWERF)

ATTACHMENT F

ICPR Node Diagram
and Summary Tables

HDR

HDR Engineering, Inc.
5435 BrynMawr Dr., Ste. 400
Tampa, FL 33609-3444
(813) 282-2200
CA00004213

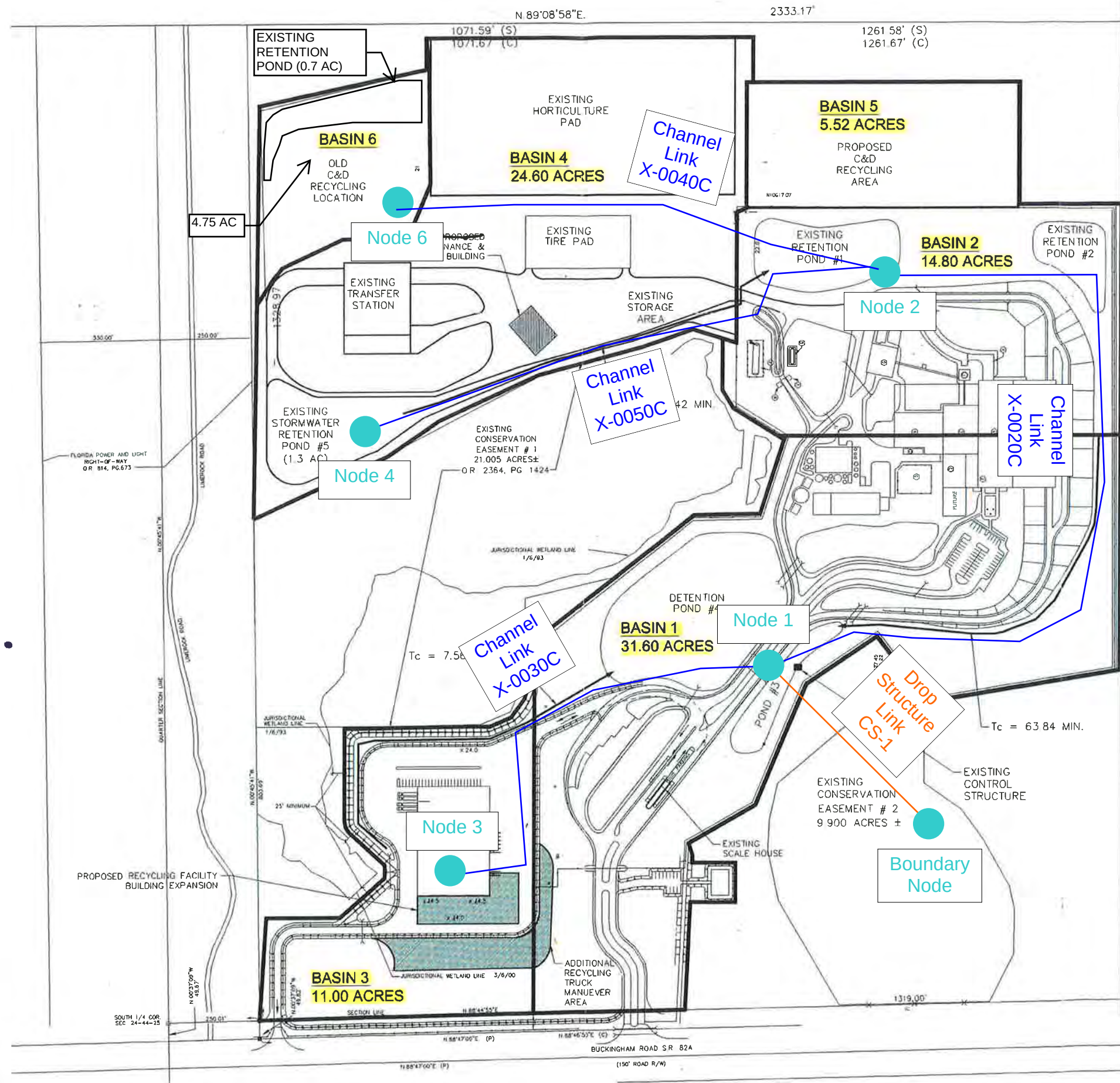


FIGURE 6
Basin Delineation / Site Plan
Lee County Solid Waste Energy
Recovery Facility (SWERF)

ICPR Model Results Summary

Storm Event	Node Name	Basin	Existing Max Stage (ft., NGVD 29)	Proposed Max Stage (ft., NGVD 29)	Comment
10-year/24-hour	Node 1	1	21.00	22.6	Centerline of Buckingham Road is 23.80'
	Node 2	2	22.60	23.03	
	Node 3	3	23.02	22.6	
	Node 4	4	22.60	22.6	
	Node 5	5	23.47	23.48	
	Node 6	6	23.02	23.03	
100-year/72-hour	Node 1	1	21.00	21	Finished floor elev. 24.75'
	Node 2	2	23.43	23.43	
	Node 3	3	24.11	24.12	
	Node 4	4	23.43	23.43	
	Node 5	5	24.61	24.62	
	Node 6	6	24.11	24.12	

25-year/72-hour Discharge from Site	
Existing Condition (cfs)	Proposed Condition (cfs)
1.88	1.88

Excerpts from Previous Permit Documents

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**CALCULATION SUMMARY
& CONTROL SHEET**
Page 1 of 2

CALCULATION SET NO.

7102-C-SWM-001

PRELIM.	FINAL	VOID	REVISION
X			X 2

DISCIPLINE CIVILJ.O. 7102.001PROJECT TITLE LEE COUNTY FACILITYSTRUCTURE OF SYSTEM SITE-WIDE

DESIGN CLASSIFICATION

N/A

RECEIVED

SUBJECT STORM/SURFACE WATER MANAGEMENT

JAN 04 1993

COMPLETED BY CARMEN D'ANGELODATE 7/29/92CHECKED BY Heone Trough/whuDATE 7/31/92

APPROVED BY

DATE

SDE OR MGR OF STAFF GROUP

REASON FOR REVISION:

ORIGINAL ISSUE, REV. 0:

TOTAL NUMBER OF SHEETS

IN THIS ISSUE 35SHEETS REVISED, ADDED OR
DELETED 4, REV. 1

REV. 1 - CHANGED CONTROL ELEVATION TO ELEVATION 21.40' NGVD & TOP OF BERM ELEVATION TO 24.00' NGVD. ADDED BASIN 1 25-YEAR, 5-DAY STORM ROUTING SHEETS. SEE ATTACHMENT D FOR NEW CONTROL ELEVATION VERIFICATION. A CHANGE FLOOR EL. TO 24.26' NGVD.

PROBLEM STATEMENT:

DETERMINE A SPECIFIC DESIGN FOR STORM/SURFACE WATER MANAGEMENT IN ACCORDANCE WITH STATE OF FLORIDA SOUTH FLORIDA WATER MANAGEMENT DISTRICT (SFWMD) REGULATIONS, LEE COUNTY/OGDEN MARTIN CRITERIA & SITE SPECIFIC DESIGN REQUIREMENTS OF SITE CERTIFICATION APPLICATION (CASE NO. 90-3942 EPP). A PORTION OF THIS PROJECT SITE IS PROPOSED FOR WET DETENTION (BASIN 1) & ANOTHER PORTION WET RETENTION (BASIN 2).

SUMMARY/CONCLUSIONS:

SECTION A OF ATTACHED SHEETS GIVES SITE DATA & DESIGN CRITERIA, SECTION B CONSISTS OF COMPUTATIONS FOR A DETENTION SYSTEM (BASIN 1) & A TOTAL RETENTION SYSTEM (BASIN 2) AND ATTACHMENTS A, B & C GIVE THE 10, 25 & 100-YEAR ROUTING RESULTS FOR EACH BASIN & STAGE-DISCHARGE RELATIONSHIPS. THE FOLLOWING TABLE SUMMARIZES THE ROUTING:

	<u>BASIN 1</u>		<u>BASIN 2</u>	
<u>STORM EVENT</u>	<u>STAGE*</u>	<u>DISCHARGE</u>	<u>STAGE*</u>	<u>DISCHARGE</u>
<u>10-YEAR</u>	<u>23.31'</u>	<u>0.31 CFS</u>	<u>23.31'</u>	<u>0 CFS</u>
<u>25-YEAR</u>	<u>23.92'</u>	<u>0.36 CFS</u>	<u>23.99'</u>	<u>0 CFS</u>
<u>100-YEAR</u>	<u>24.20'</u>	<u>1.30 CFS</u>	<u>24.26'</u>	<u>0 CFS**</u>

* AS 1929 NGVD

** ADJACENT LANDS
FLOODED

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GENERAL
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PRELIM.	FINAL	VOID		DATE	DATE
X				7/20/92	7/31/92
SHEET 8 OF 22			1	CJD	L.M.T.
J.O. 7102.001				DATE	DATE
				8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY

SUBJECT SURFACE WATER MANAGEMENT

$$Q_{25} = (9.8'' - 0.2(1.3''))^2 / (9.8'' + 0.8(1.3''))$$

$$Q_{25} = 8.4'' \text{ RUNOFF}$$

$$\text{VOLUME} = 8.4'' (14.8 \text{ AC.}) (1 \text{ FT.} / 12'')$$

$$= \underline{10.4 \text{ AC.} - \text{FT. OF RUNOFF @ 25-YEAR EVENT}}$$

$$Q_{100} = (P - 0.25)^2 / (P + 0.85)$$

$$Q_{100} = (12.2'' - 0.2(1.3''))^2 / (12.2'' + 0.8(1.3''))$$

$$Q_{100} = 10.8'' \text{ RUNOFF}$$

$$\text{VOLUME} = 10.8'' (14.8 \text{ AC.}) (1 \text{ FT.} / 12'')$$

$$= \underline{13.3 \text{ AC.} - \text{FT. OF RUNOFF @ 100-YEAR EVENT}}$$

5. DEVELOP RETENTION AREA STAGE-STORAGE

CURVE:

STAGE (FT. NGVD)	BASIN 2		TOTAL (AC.-FT.)
	PONDS (AC.-FT.)	SITE (AC.-FT.)	

21.4

0

0

0

22

$$2.3 \times 0.6' = 1.4$$

0

1.4

23

2.3*

3.7

24

9.0*

10.4

25

$$2.3 \times 0.6' = 1.4$$

20.3*

21.7

* SEE SH. 10

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X				7/21/92	7/31/92
SHEET	13	OF 22	1	CJD	L.M.T
J.O.	7102.001			DATE	DATE
				8/18/92	8/25/92

PROJECT LEE COUNTY FACILITY
SUBJECT SURFACE WATER MANAGEMENT

$$Q_{25} = (9.8'' - 0.2(1.2''))^2 / (9.8'' + 0.8(1.2''))$$

$$Q_{25} = \underline{8.5'' \text{ RUNOFF}}$$

$$\begin{aligned} \text{VOLUME} &= 8.5'' (31.6 \text{ AC.}) (1 \text{ FT.} / 12'') \\ &= \underline{22.4 \text{ AC.-FT. OF RUNOFF @ 25-YEAR EVENT}} \end{aligned}$$

$$Q_{100} = (P - 0.2S)^2 / (P + 0.8S)$$

$$Q_{100} = (12.2'' - 0.2(1.2''))^2 / (12.2'' + 0.8(1.2''))$$

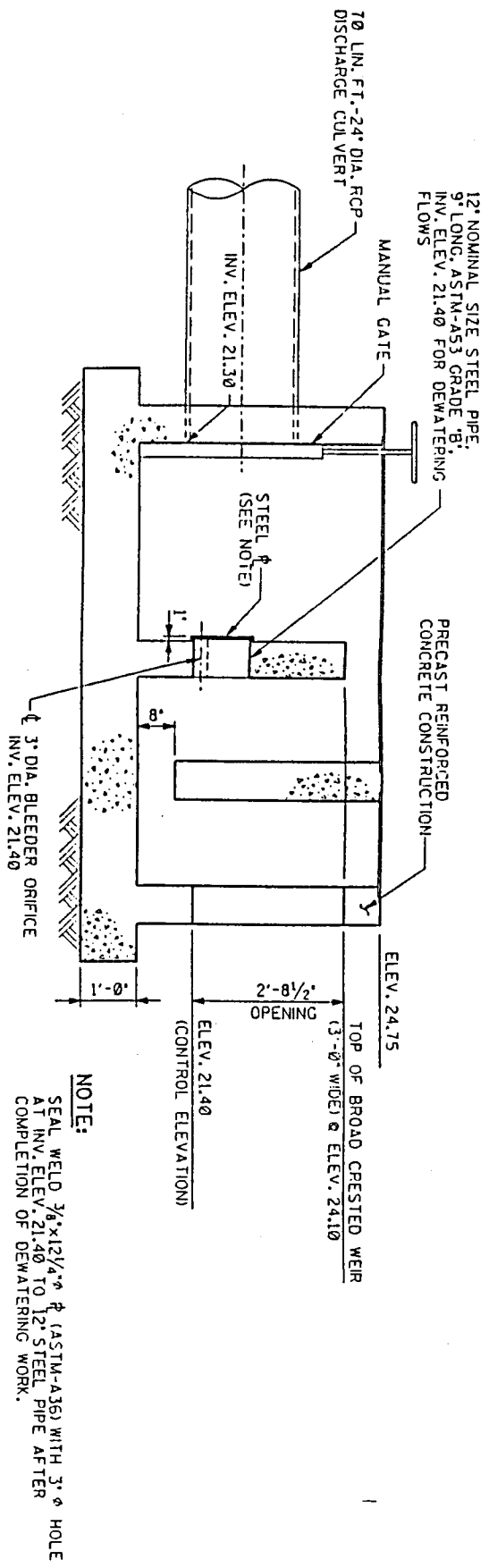
$$Q_{100} = \underline{10.9'' \text{ RUNOFF}}$$

$$\begin{aligned} \text{VOLUME} &= 10.9'' (31.6 \text{ AC.}) (1 \text{ FT.} / 12'') \\ &= \underline{28.7 \text{ AC.-FT. OF RUNOFF @ 100-YEAR EVENT}} \end{aligned}$$

3. DEVELOP DETENTION AREA STAGE-STORAGE CURVE:

STAGE (FT. NGVD)	BASIN 1		TOTAL (AC.-FT.)
	PONDS (AC.-FT.)	SITE (AC.-FT.)	
21.4	0	0	0
22	$4.3 \times 0.6' \approx 2.6$	0	2.6
23		5.0*	7.6
24		20.0*	22.6
25	$4.3 \times 0.6' = 2.6$	45*	47.6
	* SEE SH. 15		



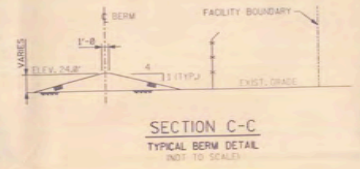
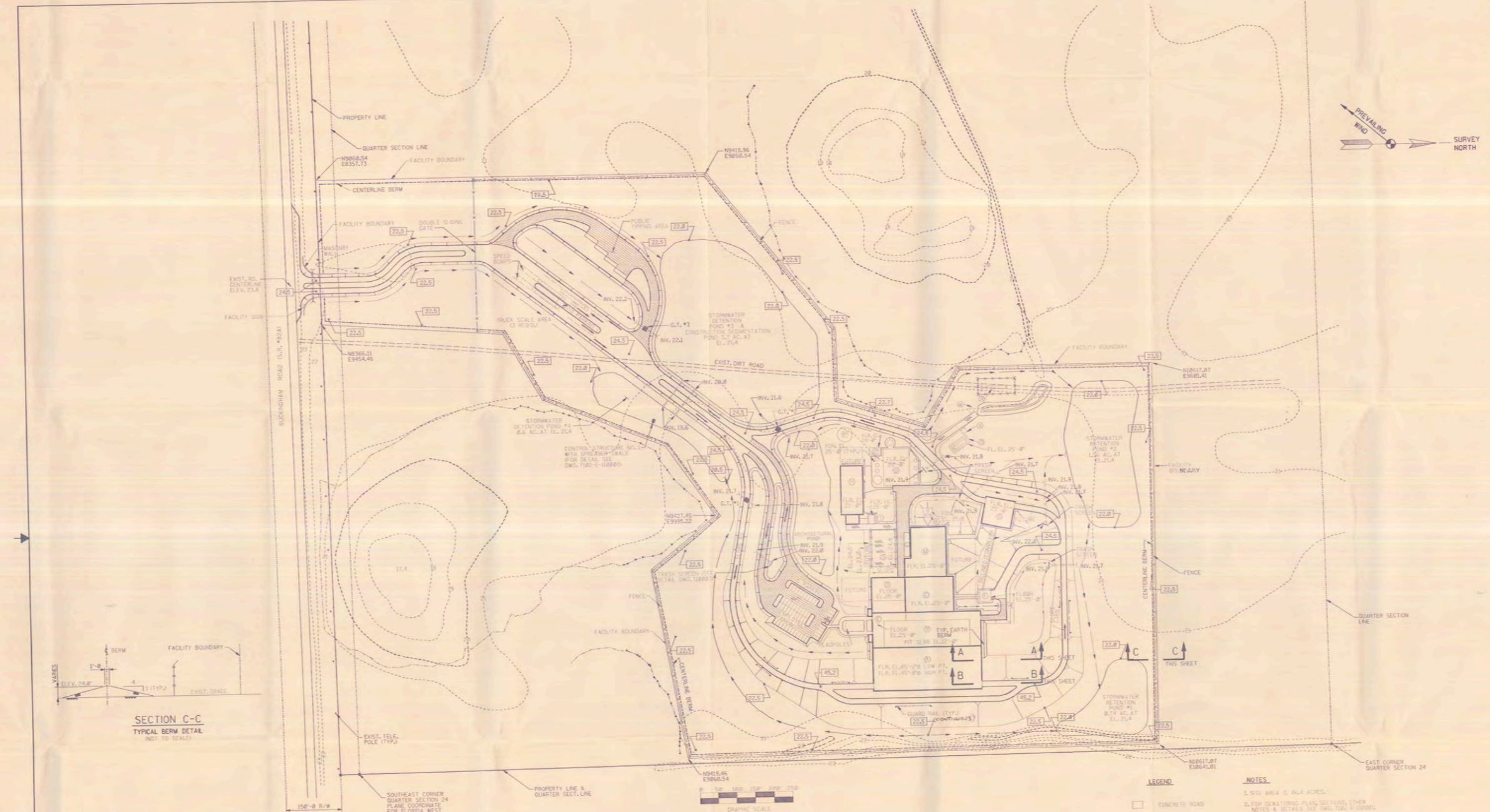


CONTROL STRUCTURE DETAILS

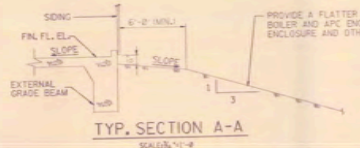
Note: The existing 3" bleeder orifice will be increased to 8".

REVISIONS
A-1/22/92-PRELIMINARY NOT FOR CONSTRUCTION
B-8/7/92-REVISED FOR DMS REVIEW
C-8/25/92-REVISED FOR CONSTRUCTION

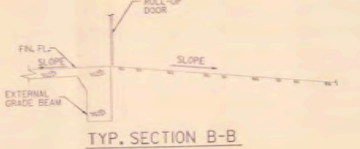
DATE: 8/25/92
DRAWN BY: JLM
CHECKED BY: JLM
APPROVED BY: JLM



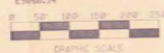
SECTION C-C
TYPICAL BERM DETAIL
(NOT TO SCALE)



TYP. SECTION A-A
SCALE: 1/4"=1'-0"



TYP. SECTION B-B
SCALE: 1/4"=1'-0"



BUILDING INDEX

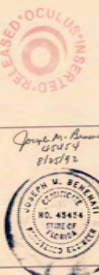
- (A) TYPING AREA
- (B) REFUSE PIT AREA
- (C) BOILER AREA
- (D) TUBING/GENERATOR AREA
- (E) FACILITY ADMINISTRATION AREA
- (F) GRIZZLY BUILDING
- (G) RESIDUE HANDLING BUILDING
- (H) COOLING TOWER
- (I) STACK
- (J) SETTLING BASIN
- (K) APC AREA
- (L) SCALE HOUSE
- (M) FIRE WATER TANK & PUMP HOUSE
- (N) WASTEWATER STORAGE
- (O) PROPOSED STORAGE
- (P) SWITCHING
- (Q) CHLORINATION BUILDING
- (R) WATER TREATMENT BUILDING
- (S) AMMONIA UNLOADING STATION
- (T) PROPOSED UNLOADING STATION

LEGEND

- CONCRETE ROAD
- GRAVEL ROAD
- ASPHALT ROAD
- REINFORCED CONCRETE PIPE
- FLOW DIRECTION
- 20" Ø DETRACK FOR JUNCTIONAL WETLANDS
- EXISTING CONTOUR
- GREASE TRAP
- FRESH GRADE ELEVATION
- FENCE
- MEADOW

NOTES

1. SITE AREA IS 46.4 ACRES.
2. FOR DETAILED PLANS SEE OTHER SHEETS & DETAILS SET DWG. 7102-E-110000.
3. FOR ADDITIONAL DETAILS, SEE DWG. 7102-E-110000.
4. QUARTER SECTION INFORMATION IS TAKEN FROM MAP OF BOUNDARY SURVEY OF PART OF SECTIONS 24 & 25, T45N, R20E, LEE COUNTY, ILLINOIS, FILE NO. 2999 OF ADJUTANT GENERAL & SURVEY DATED JUNE 22, 1986.



United Engineers & Constructors A Bechtel Company			
CIVIL PLOT PLAN LEE COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY			
OGDEN MARTIN SYSTEMS OF LEE, INC.			
DATE: 8/12/92	DESIGNED BY: JLM	DATE: 8/12/92	PROJECT NO.: C-1033
DATE: 8/12/92	DESIGNED BY: JLM	DATE: 8/12/92	PROJECT NO.: 7102-E-110000
DATE: 8/12/92	DESIGNED BY: JLM	DATE: 8/12/92	PROJECT NO.: 7102-E-110000
DATE: 8/12/92	DESIGNED BY: JLM	DATE: 8/12/92	PROJECT NO.: 7102-E-110000

COMPANY CONFIDENTIAL
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ICPR4 Model Input and Output Files

Manual Basin: Basin 1

Scenario: Existing Condition
 Node: Node 1
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 63.8400 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 31.6000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
2.2900	Building	A			
4.5800	Roadway	A			
5.2000	Water	A			
19.5300	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 2

Scenario: Existing Condition
 Node: Node 2
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 48.4200 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 14.8000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
1.4000	Building	A			
1.1100	Roadway	A			
2.2600	Water	A			
10.0300	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 3

Scenario: Existing Condition
 Node: Node 3
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number

Time of Concentration: 10.0000 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 11.0100 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
1.9900	Building	A			
6.9300	Roadway	A			
2.0900	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 4

Scenario: Existing Condition
 Node: Node 4
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 10.0000 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 24.6000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
2.4100	Building	A			
8.3500	Roadway	A			
1.3000	Water	A			
12.5400	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 6

Scenario: Existing Condition
 Node: Node 6
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 10.0000 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 4.7500 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
2.2800	Roadway	A			
0.7000	Water	A			
1.7700	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 1

Scenario: Proposed Condition
 Node: Node 1
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 63.8400 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 31.6000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
2.2900	Building	A			
4.6450	Roadway	A			
5.2000	Water	A			
19.4650	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 2

Scenario: Proposed Condition
 Node: Node 2
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 48.4200 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 14.8000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
1.4500	Building	A			
1.1100	Roadway	A			
2.2600	Water	A			
9.9800	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 3

Scenario: Proposed Condition
 Node: Node 3
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 10.0000 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 11.0100 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
1.9900	Building	A			
6.9300	Roadway	A			
2.0900	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 4

Scenario: Proposed Condition
 Node: Node 4
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 10.0000 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 24.6000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
2.5000	Building	A			
8.4600	Roadway	A			
1.3000	Water	A			
12.3400	Pervious	A			

Comment: See HDR Stormwater Calculations for areas

Manual Basin: Basin 6

Scenario: Proposed Condition
 Node: Node 6
 Hydrograph Method: NRCS Unit Hydrograph
 Infiltration Method: Curve Number
 Time of Concentration: 10.0000 min
 Max Allowable Q: 0.00 cfs
 Time Shift: 0.0000 hr
 Unit Hydrograph: UH256
 Peaking Factor: 256.0
 Area: 4.7500 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
2.3100	Roadway	A			
0.7000	Water	A			
1.6400	Pervious	A			
0.1000	Building	A			

Comment: See HDR Stormwater Calculations for areas

Node: Boundary Node

Scenario: Existing Condition
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 21.00 ft
 Warning Stage: 0.00 ft
 Boundary Stage:

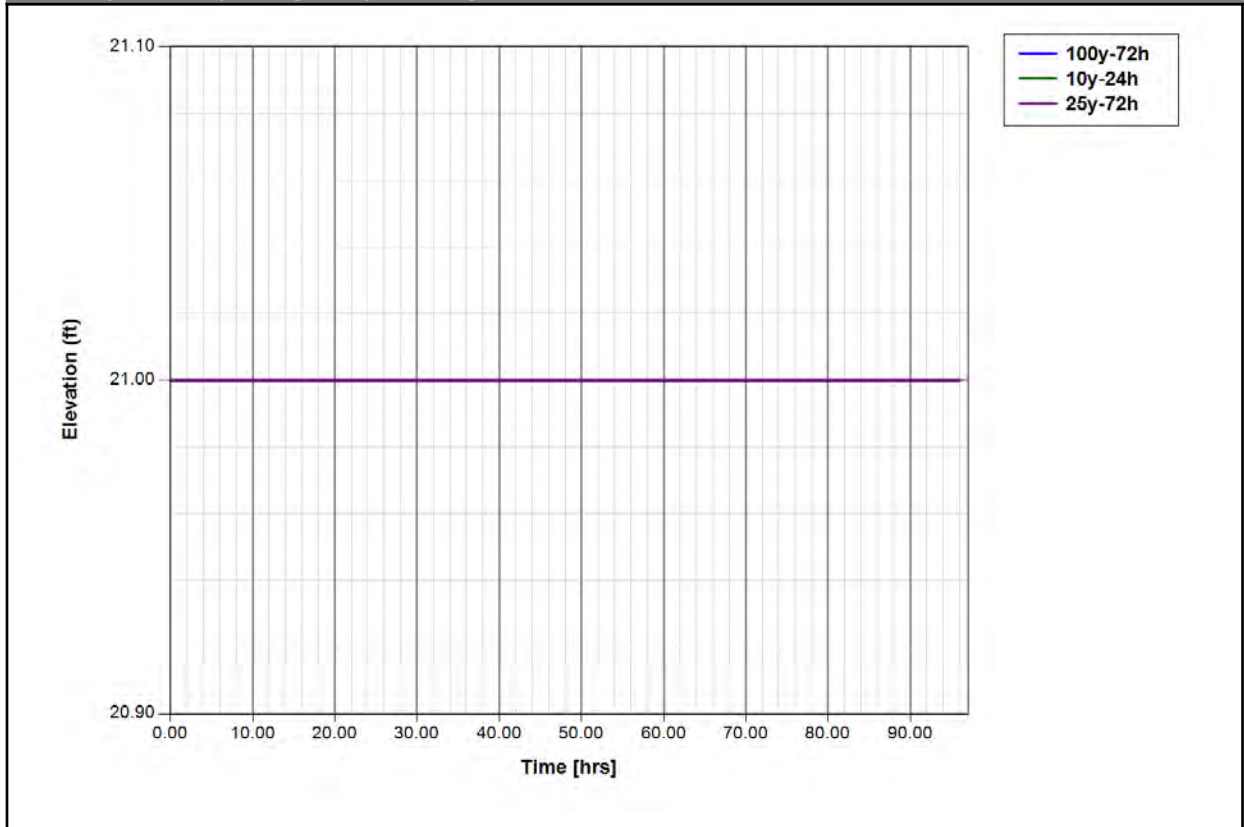
Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	21.00
0	0	0	1000.0000	21.00

Comment:

Node Max Conditions [Existing Condition]

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]
Boundary Node	100y-72h	0.00	21.00	0.0000	2.09	0.00	0
Boundary Node	10y-24h	0.00	21.00	0.0000	1.50	0.00	0
Boundary Node	25y-72h	0.00	21.00	0.0000	1.88	0.00	0

Node Stage: Boundary Node [Existing Condition]



Node: Node 1

Scenario: Existing Condition
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 23.80 ft

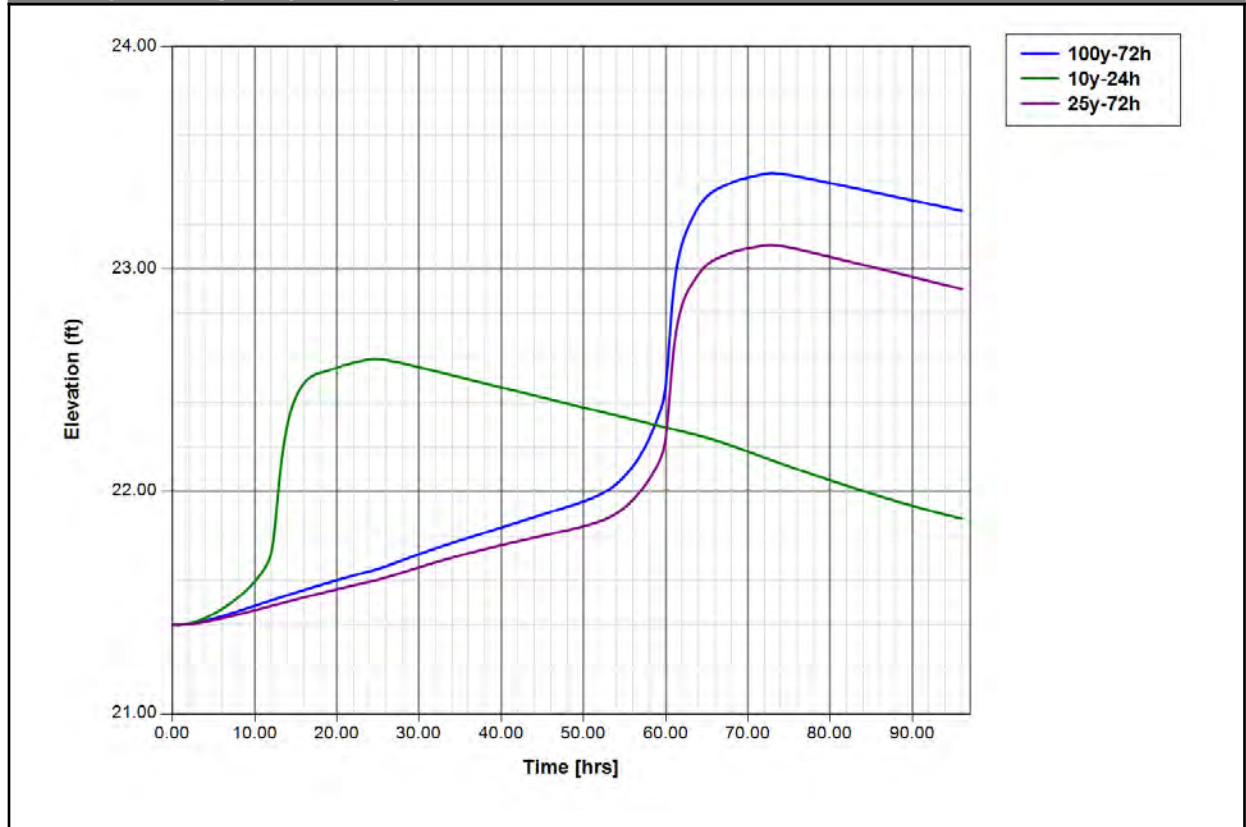
Stage [ft]	Volume [ac-ft]	Volume [ft3]
21.40	0.00	0
22.00	2.60	113256
23.00	7.60	331056
24.00	22.60	984456
25.00	47.60	2073456

Comment: Stage/Volume values taken from existing permit 90-3942 calculations dated 8/18/1992

Node Max Conditions [Existing Condition]

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]
Node 1	100y-72h	23.80	23.43	0.0008	56.24	10.88	656196
Node 1	10y-24h	23.80	22.60	0.0009	23.24	3.39	348362
Node 1	25y-72h	23.80	23.11	0.0007	42.71	7.61	497230

Node Stage: Node 1 [Existing Condition]



Node: Node 2

Scenario: Existing Condition
Type: Stage/Volume
Base Flow: 0.00 cfs
Initial Stage: 21.40 ft
Warning Stage: 22.50 ft

Stage [ft]	Volume [ac-ft]	Volume [ft3]
21.40	0.00	0
22.00	1.40	60984

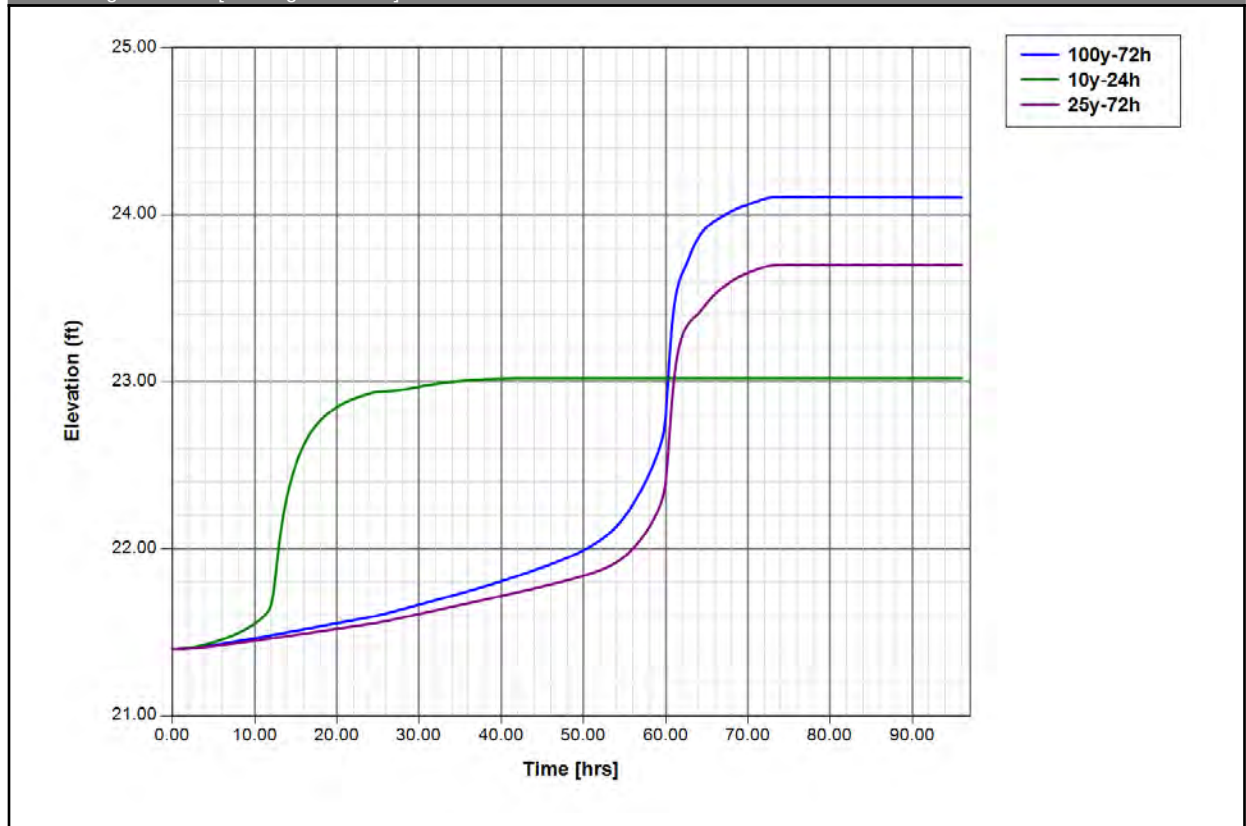
Stage [ft]	Volume [ac-ft]	Volume [ft3]
23.00	3.70	161172
24.00	10.40	453024
25.00	21.70	945252

Comment: Stage/Volume values taken from existing permit 90-3942 calculations dated 8/18/1992

Node Max Conditions [Existing Condition]

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]
Node 2	100y-72h	22.50	24.11	0.0010	60.77	20.20	474063
Node 2	10y-24h	22.50	23.02	0.0010	12.63	2.00	227753
Node 2	25y-72h	22.50	23.70	0.0010	37.09	10.79	377816

Node Stage: Node 2 [Existing Condition]



Node: Node 3

Scenario: Existing Condition
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 23.80 ft

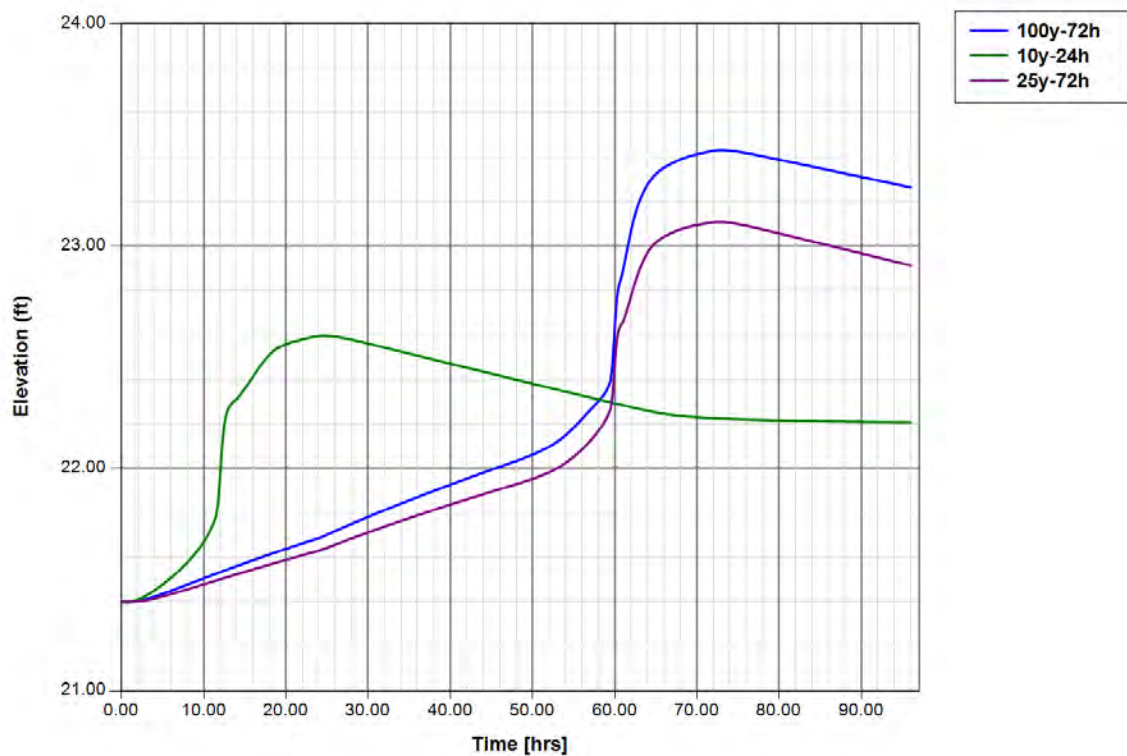
Stage [ft]	Area [ac]	Area [ft2]
20.33	0.0002	9
21.00	0.5977	26037
22.00	4.6318	201762
23.00	6.0891	265239
24.00	8.5421	372096
25.00	11.0347	480672
26.00	11.0368	480761
27.00	11.0368	480761

Comment: Stage/area table automatically produced from FDEM 2004-2008 LiDAR data

Node Max Conditions [Existing Condition]

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]
Node 3	100y-72h	23.80	23.43	0.0004	54.71	9.42	320191
Node 3	10y-24h	23.80	22.60	0.0005	35.51	1.35	245379
Node 3	25y-72h	23.80	23.11	0.0004	43.11	7.41	284318

Node Stage: Node 3 [Existing Condition]



Node: Node 4

Scenario: Existing Condition
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 23.80 ft

Stage [ft]	Area [ac]	Area [ft2]
18.93	0.0004	18
19.00	0.0010	42
20.00	1.1614	50589
21.00	1.6911	73665
22.00	2.4079	104886
23.00	2.8525	124254
24.00	3.4795	151569
25.00	4.3074	187632
26.00	4.6105	200835
27.00	4.7452	206703
28.00	4.8634	211851

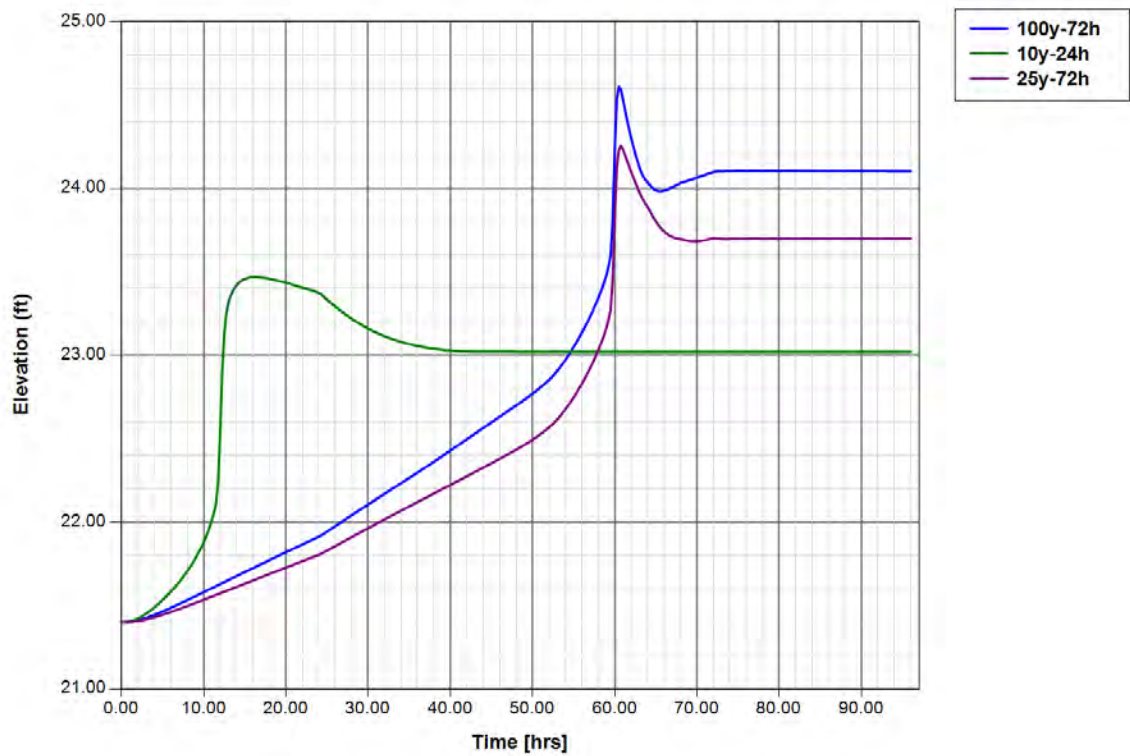
Stage [ft]	Area [ac]	Area [ft2]
29.00	4.9833	217071
30.00	5.0992	222120
31.00	5.2099	226944
32.00	5.3147	231507
33.00	5.4314	236592
34.00	5.5287	240831
35.00	5.6138	244539
36.00	5.7091	248688
37.00	5.7957	252459
38.00	5.8969	256869
39.00	5.9876	260820
40.00	6.1267	266877
41.00	6.2535	272403
42.00	6.4388	280476
43.00	7.0120	305443
44.00	7.0146	305555
45.00	7.0146	305555

Comment: Stage/area table automatically produced from FDEM 2004-2008 LiDAR data

Node Max Conditions [Existing Condition]

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]
Node 4	100y-72h	23.80	24.61	0.0010	104.76	34.88	193670
Node 4	10y-24h	23.80	23.47	0.0010	54.63	2.90	149015
Node 4	25y-72h	23.80	24.26	0.0010	79.16	18.99	177449

Node Stage: Node 4 [Existing Condition]



Node: Node 6

Scenario: Existing Condition
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 23.80 ft

Stage [ft]	Area [ac]	Area [ft2]
20.36	0.0002	9
21.00	0.1283	5589
22.00	2.0762	90441
23.00	2.9014	126387
24.00	4.2678	185904
25.00	6.1789	269154
26.00	6.2829	273681
27.00	6.3275	275625
28.00	6.3634	277191
29.00	6.3887	278292
30.00	6.4124	279324

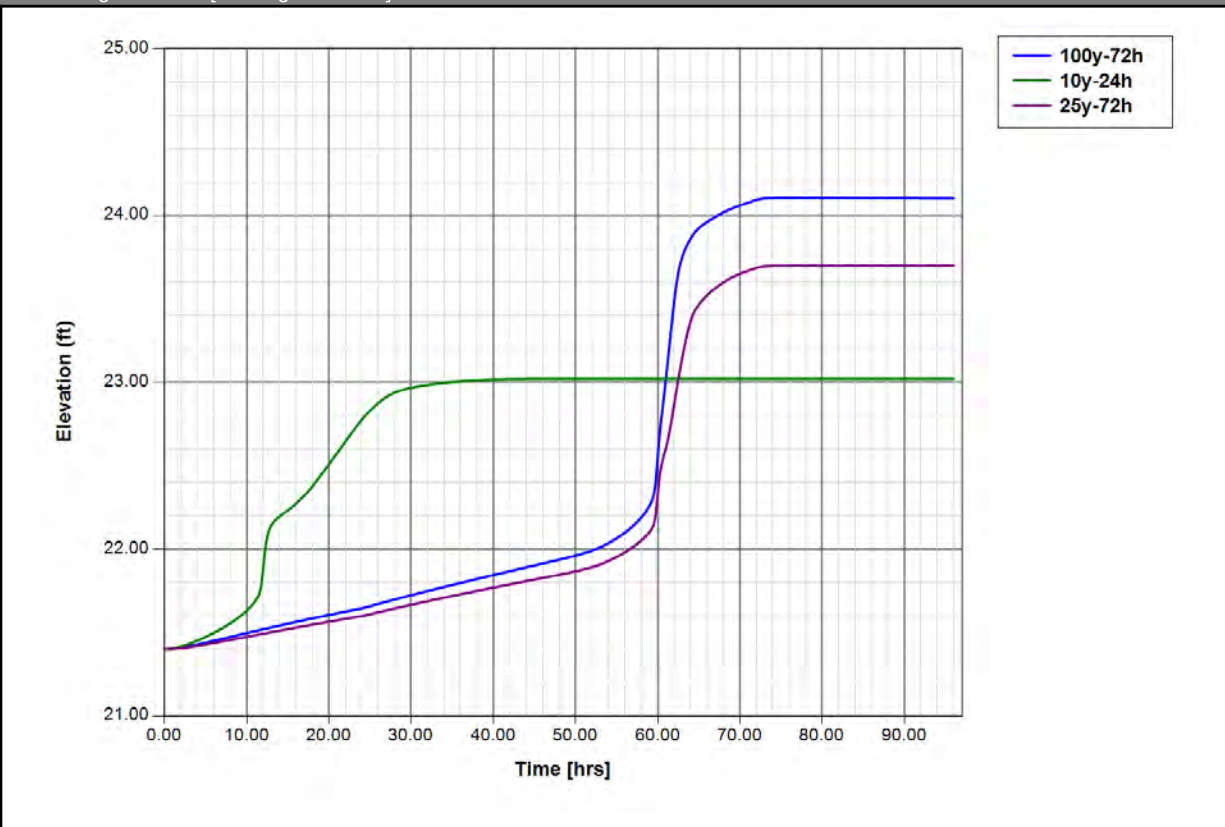
Stage [ft]	Area [ac]	Area [ft2]
31.00	6.4343	280278
32.00	6.4616	281466
33.00	6.4849	282483
34.00	6.5081	283491
35.00	6.5322	284544
36.00	6.5707	286218
37.00	6.6172	288244
38.00	6.6172	288244

Comment: Stage/area table automatically produced from FDEM 2004-2008 LiDAR data

Node Max Conditions [Existing Condition]

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]
Node 6	100y-72h	23.80	24.11	0.0010	23.07	0.01	222088
Node 6	10y-24h	23.80	23.02	0.0004	12.60	0.00	147164
Node 6	25y-72h	23.80	23.70	0.0009	16.77	0.00	193715

Node Stage: Node 6 [Existing Condition]



Node: Boundary Node

Scenario: Proposed Condition
 Type: Time/Stage
 Base Flow: 0.00 cfs
 Initial Stage: 21.00 ft
 Warning Stage: 0.00 ft
 Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	21.00
0	0	0	1000.0000	21.00

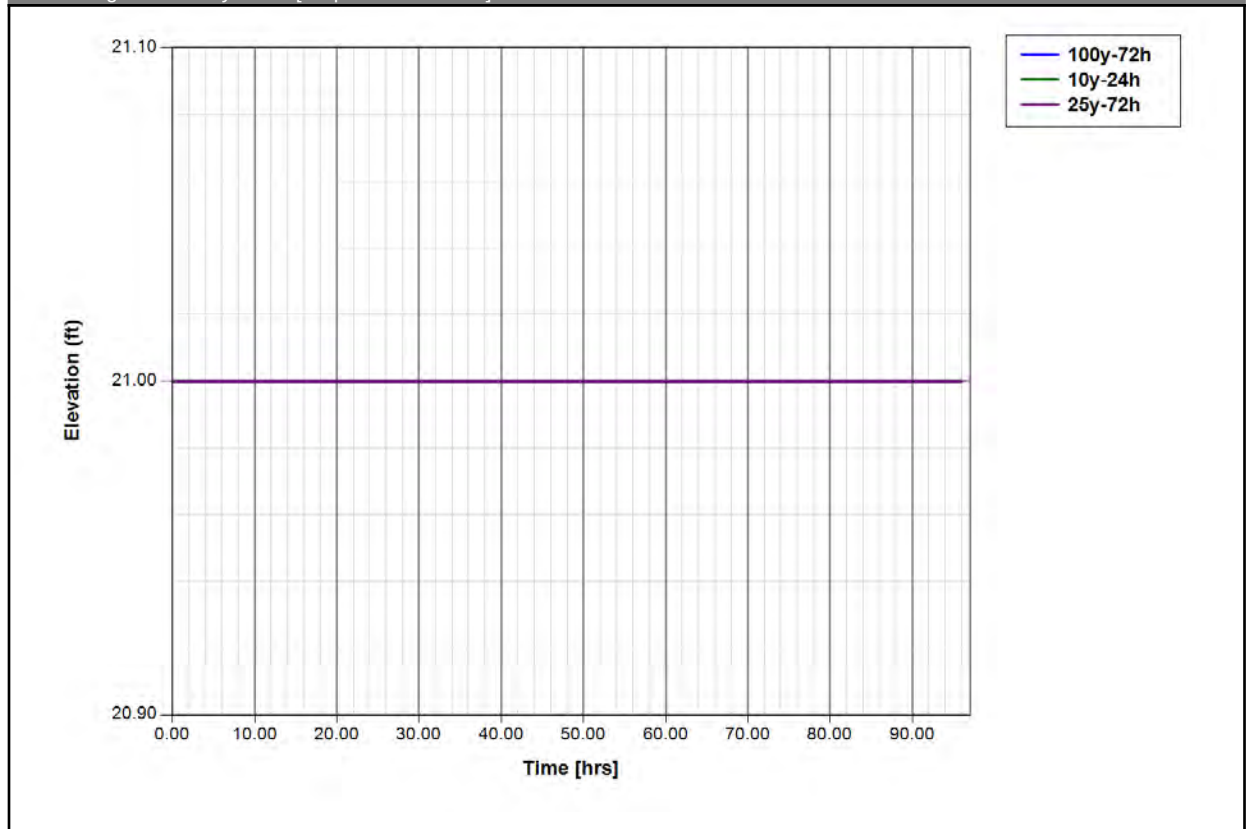
Comment:

Node Max Conditions [Proposed Condition]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
-----------	----------	--------------------	----------------	---------------------	------------------------	-------------------------	------------------------

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]
Boundary Node	100y-72h	0.00	21.00	0.0000	2.09	0.00	0
Boundary Node	10y-24h	0.00	21.00	0.0000	1.50	0.00	0
Boundary Node	25y-72h	0.00	21.00	0.0000	1.88	0.00	0

Node Stage: Boundary Node [Proposed Condition]



Node: Node 1

Scenario: Proposed Condition
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 23.80 ft

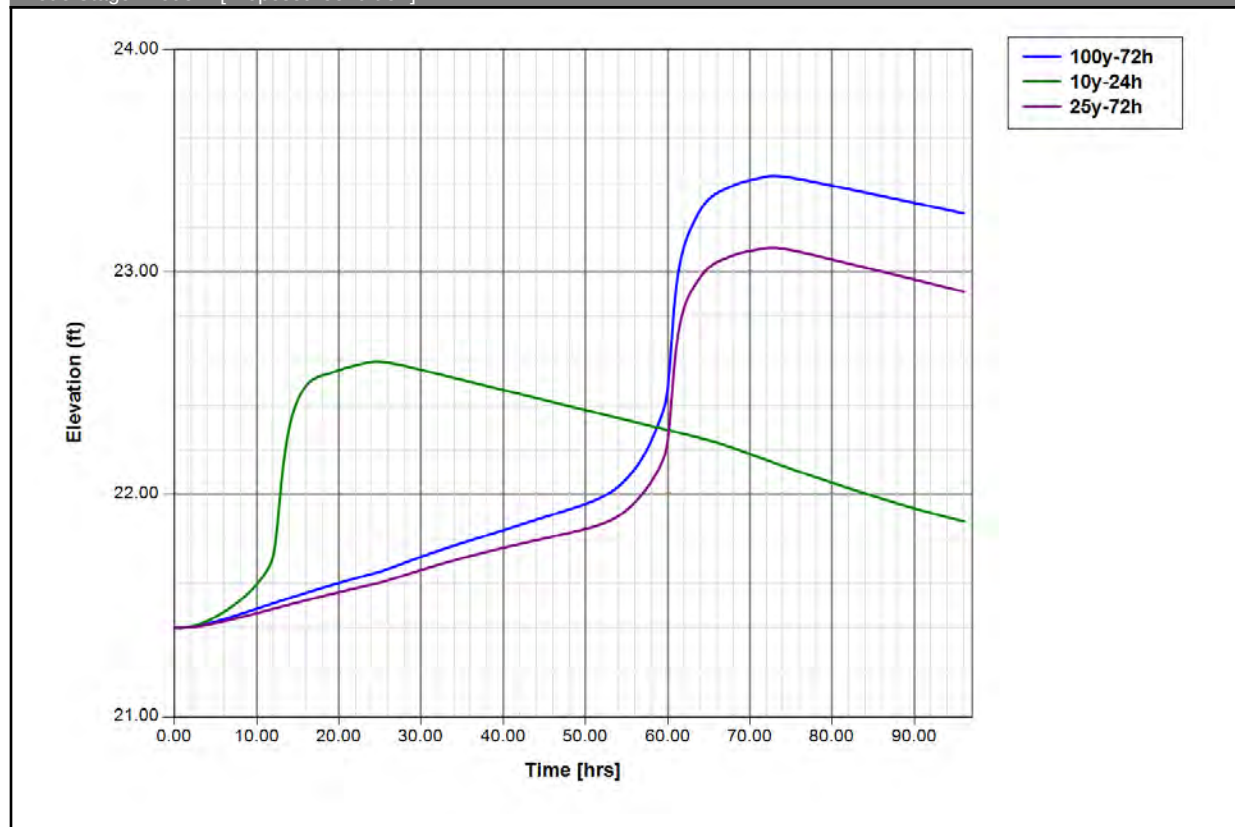
Stage [ft]	Volume [ac-ft]	Volume [ft3]
21.40	0.00	0
22.00	2.60	113256
23.00	7.60	331056
24.00	22.60	984456
25.00	47.60	2073456

Comment: Stage/Volume values taken from existing permit 90-3942 calculations dated 8/18/1992

Node Max Conditions [Proposed Condition]

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]
Node 1	100y-72h	23.80	23.43	0.0008	56.29	10.90	656892
Node 1	10y-24h	23.80	22.60	0.0009	23.32	3.42	348776
Node 1	25y-72h	23.80	23.11	0.0007	42.74	7.64	497893

Node Stage: Node 1 [Proposed Condition]



Node: Node 2

Scenario: Proposed Condition
 Type: Stage/Volume
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 22.50 ft

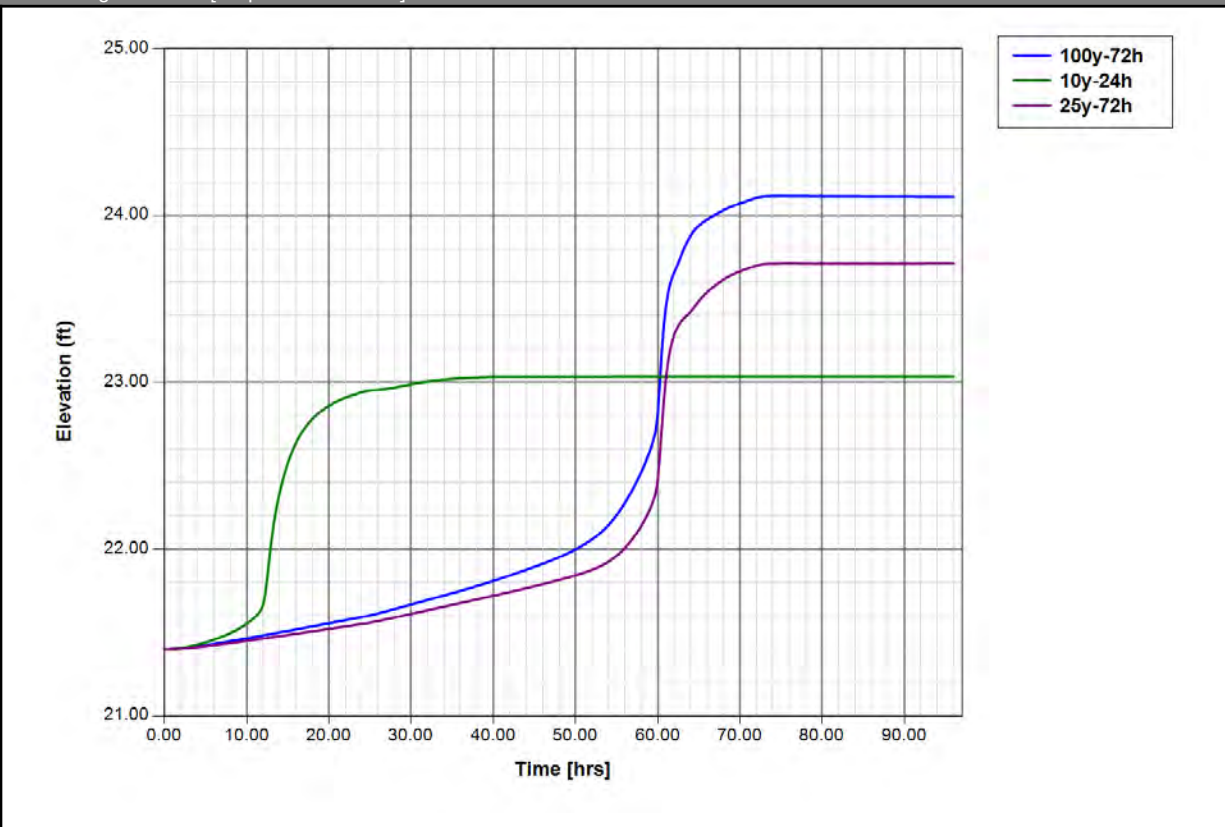
Stage [ft]	Volume [ac-ft]	Volume [ft3]
21.40	0.00	0
22.00	1.40	60984
23.00	3.70	161172
24.00	10.40	453024
25.00	21.70	945252

Comment: Stage/Volume values taken from existing permit 90-3942 calculations dated 8/18/1992

Node Max Conditions [Proposed Condition]

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]
Node 2	100y-72h	22.50	24.12	0.0010	61.25	20.33	476658
Node 2	10y-24h	22.50	23.03	0.0010	12.77	2.03	230948
Node 2	25y-72h	22.50	23.71	0.0010	37.65	10.84	380448

Node Stage: Node 2 [Proposed Condition]



Node: Node 3

Scenario: Proposed Condition
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 23.80 ft

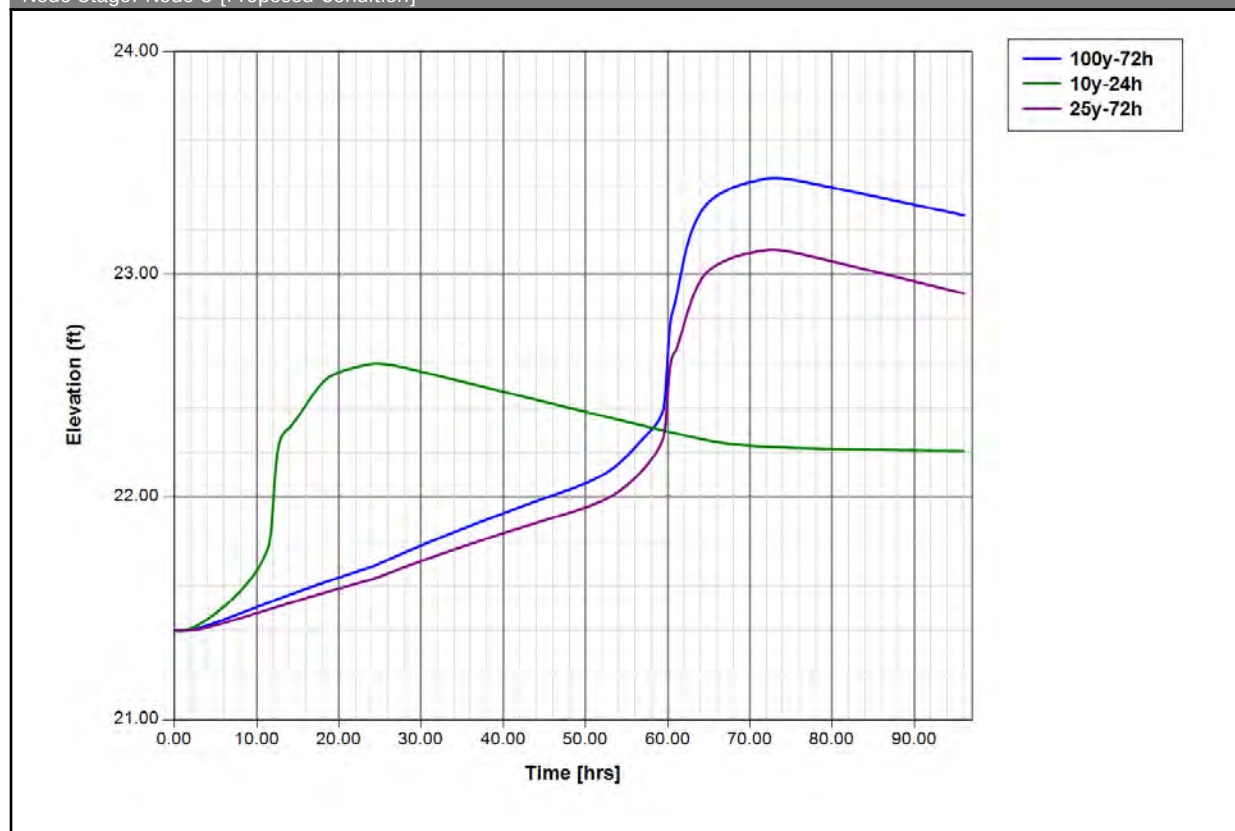
Stage [ft]	Area [ac]	Area [ft2]
20.33	0.0002	9
21.00	0.5977	26037
22.00	4.6318	201762
23.00	6.0891	265239
24.00	8.5421	372096
25.00	11.0347	480672
26.00	11.0368	480761
27.00	11.0368	480761

Comment: Stage/area table automatically produced from FDEM 2004-2008 LiDAR data

Node Max Conditions [Proposed Condition]

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]
Node 3	100y-72h	23.80	23.43	0.0004	54.71	9.41	320332
Node 3	10y-24h	23.80	22.60	0.0005	35.51	1.34	245496
Node 3	25y-72h	23.80	23.11	0.0004	43.11	7.39	284477

Node Stage: Node 3 [Proposed Condition]



Node: Node 4

Scenario: Proposed Condition
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 21.40 ft
Warning Stage: 23.80 ft

Stage [ft]	Area [ac]	Area [ft2]
18.93	0.0004	18

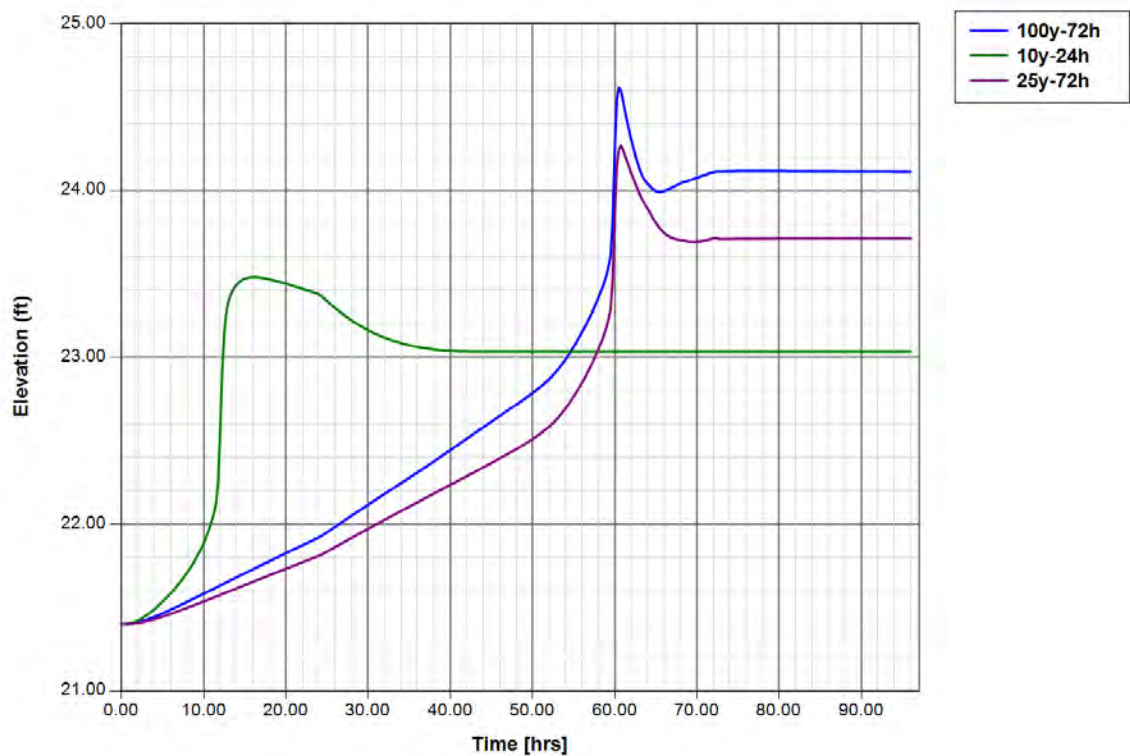
Stage [ft]	Area [ac]	Area [ft2]
19.00	0.0010	42
20.00	1.1614	50589
21.00	1.6911	73665
22.00	2.4079	104886
23.00	2.8525	124254
24.00	3.4795	151569
25.00	4.3074	187632
26.00	4.6105	200835
27.00	4.7452	206703
28.00	4.8634	211851
29.00	4.9833	217071
30.00	5.0992	222120
31.00	5.2099	226944
32.00	5.3147	231507
33.00	5.4314	236592
34.00	5.5287	240831
35.00	5.6138	244539
36.00	5.7091	248688
37.00	5.7957	252459
38.00	5.8969	256869
39.00	5.9876	260820
40.00	6.1267	266877
41.00	6.2535	272403
42.00	6.4388	280476
43.00	7.0120	305443
44.00	7.0146	305555
45.00	7.0146	305555

Comment: Stage/area table automatically produced from FDEM 2004-2008 LiDAR data

Node Max Conditions [Proposed Condition]

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]
Node 4	100y-72h	23.80	24.62	0.0010	105.20	35.27	193944
Node 4	10y-24h	23.80	23.48	0.0010	55.25	3.00	149599
Node 4	25y-72h	23.80	24.27	0.0010	79.60	19.45	177968

Node Stage: Node 4 [Proposed Condition]



Node: Node 6

Scenario: Proposed Condition
 Type: Stage/Area
 Base Flow: 0.00 cfs
 Initial Stage: 21.40 ft
 Warning Stage: 23.80 ft

Stage [ft]	Area [ac]	Area [ft2]
20.36	0.0002	9
21.00	0.1283	5589
22.00	2.0762	90441
23.00	2.9014	126387
24.00	4.2678	185904
25.00	6.1789	269154
26.00	6.2829	273681
27.00	6.3275	275625
28.00	6.3634	277191
29.00	6.3887	278292
30.00	6.4124	279324

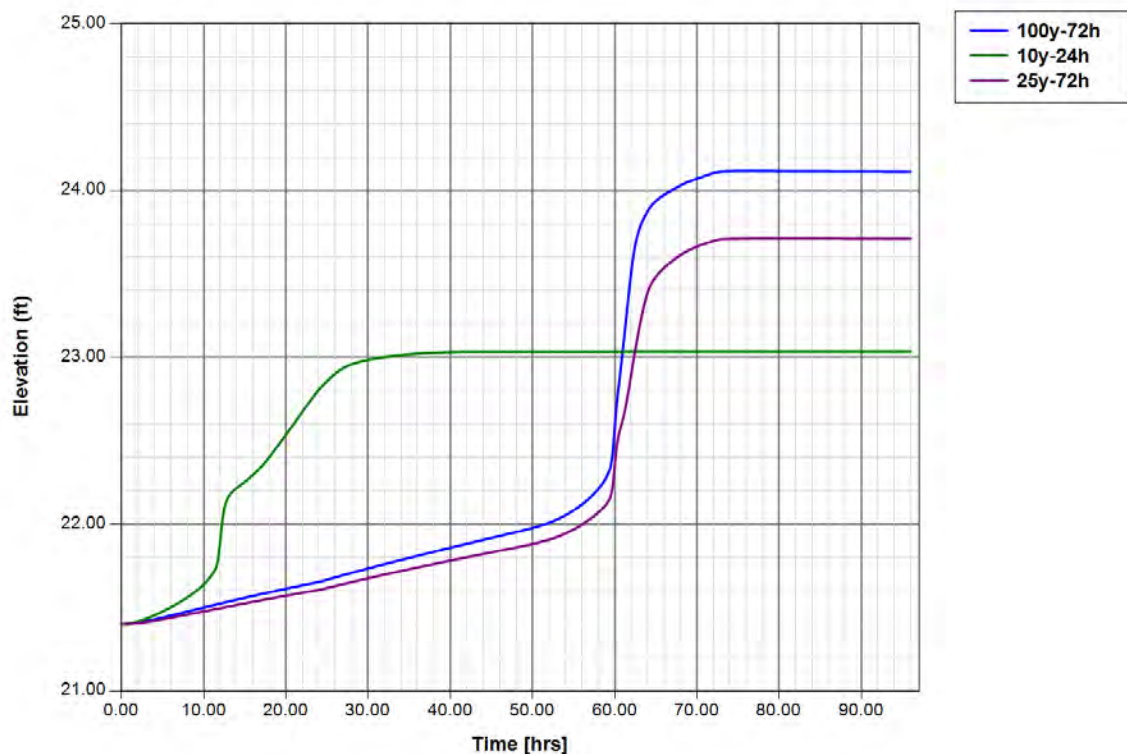
Stage [ft]	Area [ac]	Area [ft2]
31.00	6.4343	280278
32.00	6.4616	281466
33.00	6.4849	282483
34.00	6.5081	283491
35.00	6.5322	284544
36.00	6.5707	286218
37.00	6.6172	288244
38.00	6.6172	288244

Comment: Stage/area table automatically produced from FDEM 2004-2008 LiDAR data

Node Max Conditions [Proposed Condition]

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]
Node 6	100y-72h	23.80	24.12	0.0010	23.38	0.02	223168
Node 6	10y-24h	23.80	23.03	0.0004	13.01	0.00	148486
Node 6	25y-72h	23.80	23.71	0.0009	17.06	0.00	194507

Node Stage: Node 6 [Proposed Condition]



Drop Structure Link: CS-1		Upstream Pipe	Downstream Pipe
Scenario:	Existing Condition	Invert: 21.30 ft	Invert: 21.00 ft
From Node:	Node 1	Manning's N: 0.0120	Manning's N: 0.0120
To Node:	Boundary Node	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:	10	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:	70.00 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 ft		
Energy Switch:	Energy		
Pipe Comment:			

Weir Component	
Weir: 1	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Sharp Crested Vertical	Top Clip
Geometry Type: Circular	Default: 0.00 ft
Invert: 21.40 ft	Op Table:
Control Elevation: 21.40 ft	Ref Node:
Max Depth: 0.67 ft	Discharge Coefficients
	Weir Default: 3.200
	Weir Table:
	Orifice Default: 0.600
	Orifice Table:
Weir Comment:	

Weir Component	
Weir: 2	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Sharp Crested Vertical	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 24.10 ft	Op Table:
Control Elevation: 24.10 ft	Ref Node:
Max Depth: 0.65 ft	Discharge Coefficients
Max Width: 3.00 ft	Weir Default: 3.130
Fillet: 0.00 ft	Weir Table:
	Orifice Default: 0.600
	Orifice Table:
Weir Comment:	

Weir Component	
Weir: 3	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Horizontal	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 24.75 ft	Op Table:
Control Elevation: 24.75 ft	Ref Node:
Max Depth: 3.00 ft	Discharge Coefficients
Max Width: 3.50 ft	Weir Default: 3.200
Fillet: 0.00 ft	Weir Table:
	Orifice Default: 0.600
	Orifice Table:
Weir Comment:	
Drop Structure Comment:	

Link Min/Max Conditions [Existing Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-1 - Pipe	100y-72h	2.09	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 1	100y-72h	2.09	0.00	-0.01	5.98	5.98	5.98
CS-1 - Weir: 2	100y-72h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 3	100y-72h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Pipe	10y-24h	1.50	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 1	10y-24h	1.50	0.00	0.01	4.30	4.30	4.30
CS-1 - Weir: 2	10y-24h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 3	10y-24h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Pipe	25y-72h	1.88	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 1	25y-72h	1.88	0.00	-0.01	5.38	5.38	5.38
CS-1 - Weir: 2	25y-72h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 3	25y-72h	0.00	0.00	0.00	0.00	0.00	0.00

Channel Link: L-0020C

Upstream

Downstream

Scenario: Existing Condition	Invert: 23.91 ft	Invert: 22.70 ft
From Node: Node 2	Manning's N: 0.0000	Manning's N: 0.0000
To Node: Node 1	Geometry: Irregular	Geometry: Irregular
Link Count: 1	Cross Section: X-0010C	Cross Section: X-0020C
Flow Direction: Both		
Damping: 0.0000 ft		
Length: 1429.56 ft		
Contraction Coef: 0.00		
Expansion Coef: 0.00		
Entr Loss Coef: 0.00		
Exit Loss Coef: 0.00		
Bend Loss Coef: 0.00		
Bend Location: 0.00 ft		
Energy Switch: Energy		

Comment:

Link Min/Max Conditions [Existing Condition]

Link Name	Sim Name	Max Flow	Min Flow [cfs]	Min/Max	Max Us	Max Ds	Max Avg
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Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0020C	100y-72h	0.04	0.00	0.00	0.15	0.00	0.07
L-0020C	10y-24h	0.00	0.00	0.00	0.00	0.00	0.00
L-0020C	25y-72h	0.00	0.00	0.00	0.00	0.00	0.00

Channel Link: L-0030C		Upstream	Downstream
Scenario:	Existing Condition	Invert: 21.48 ft	Invert: 22.19 ft
From Node:	Node 3	Manning's N: 0.0000	Manning's N: 0.0000
To Node:	Node 1	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: X-0030C	Cross Section: X-0040C
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	375.98 ft		
Contraction Coef:	0.00		
Expansion Coef:	0.00		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.00 ft		
Energy Switch:	Energy		
Comment:			

Link Min/Max Conditions [Existing Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0030C	100y-72h	9.42	-9.02	-0.31	0.35	1.18	0.64
L-0030C	10y-24h	1.35	-1.97	-0.07	-0.22	1.14	0.62
L-0030C	25y-72h	7.41	-5.91	-0.20	0.34	1.89	1.11

Channel Link: L-0040C		Upstream	Downstream
Scenario:	Existing Condition	Invert: 22.15 ft	Invert: 22.27 ft
From Node:	Node 6	Manning's N: 0.0000	Manning's N: 0.0000
To Node:	Node 2	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: X-0050C	Cross Section: X-0060C
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	644.23 ft		
Contraction Coef:	0.00		
Expansion Coef:	0.00		

Entr Loss Coef: 0.00
 Exit Loss Coef: 0.00
 Bend Loss Coef: 0.00
 Bend Location: 0.00 ft
 Energy Switch: Energy

Comment:

Link Min/Max Conditions [Existing Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0040C	100y-72h	0.01	-20.20	0.07	-0.36	-1.39	-0.76
L-0040C	10y-24h	0.00	-2.00	0.00	-0.18	-1.62	-0.88
L-0040C	25y-72h	0.00	-10.79	-0.04	-0.30	-1.09	-0.68

Channel Link: L-0050C

	Upstream	Downstream
Scenario: Existing Condition	Invert: 22.51 ft	Invert: 22.33 ft
From Node: Node 4	Manning's N: 0.0000	Manning's N: 0.0000
To Node: Node 2	Geometry: Irregular	Geometry: Irregular
Link Count: 1	Cross Section: X-0070C	Cross Section: X-0080C
Flow Direction: Both		
Damping: 0.0000 ft		
Length: 948.19 ft		
Contraction Coef: 0.00		
Expansion Coef: 0.00		
Entr Loss Coef: 0.00		
Exit Loss Coef: 0.00		
Bend Loss Coef: 0.00		
Bend Location: 0.00 ft		
Energy Switch: Energy		

Comment:

Link Min/Max Conditions [Existing Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0050C	100y-72h	34.88	-0.08	0.06	0.75	3.45	2.08
L-0050C	10y-24h	2.90	0.00	0.01	0.33	2.21	1.27
L-0050C	25y-72h	18.99	-0.04	-0.05	0.58	3.06	1.82

Drop Structure Link: CS-1		Upstream Pipe	Downstream Pipe
Scenario:	Proposed Condition	Invert: 21.30 ft	Invert: 21.00 ft
From Node:	Node 1	Manning's N: 0.0120	Manning's N: 0.0120
To Node:	Boundary Node	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:	10	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:	70.00 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 ft		
Energy Switch:	Energy		
Pipe Comment:			

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Circular	Default:	0.00 ft
Invert:	21.40 ft	Op Table:	
Control Elevation:	21.40 ft	Ref Node:	
Max Depth:	0.67 ft	Discharge Coefficients	
		Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	
Weir Comment:			

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	24.10 ft	Op Table:	
Control Elevation:	24.10 ft	Ref Node:	
Max Depth:	0.65 ft	Discharge Coefficients	
Max Width:	3.00 ft	Weir Default:	3.130
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	
Weir Comment:			

Weir Component	
Weir: 3	Bottom Clip
Weir Count: 1	Default: 0.00 ft
Weir Flow Direction: Both	Op Table:
Damping: 0.0000 ft	Ref Node:
Weir Type: Horizontal	Top Clip
Geometry Type: Rectangular	Default: 0.00 ft
Invert: 24.75 ft	Op Table:
Control Elevation: 24.75 ft	Ref Node:
Max Depth: 3.00 ft	Discharge Coefficients
Max Width: 3.50 ft	Weir Default: 3.200
Fillet: 0.00 ft	Weir Table:
	Orifice Default: 0.600
	Orifice Table:

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Proposed Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-1 - Pipe	100y-72h	2.09	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 1	100y-72h	2.09	0.00	-0.01	5.98	5.98	5.98
CS-1 - Weir: 2	100y-72h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 3	100y-72h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Pipe	10y-24h	1.50	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 1	10y-24h	1.50	0.00	0.01	4.30	4.30	4.30
CS-1 - Weir: 2	10y-24h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 3	10y-24h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Pipe	25y-72h	1.88	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 1	25y-72h	1.88	0.00	-0.01	5.38	5.38	5.38
CS-1 - Weir: 2	25y-72h	0.00	0.00	0.00	0.00	0.00	0.00
CS-1 - Weir: 3	25y-72h	0.00	0.00	0.00	0.00	0.00	0.00

Channel Link: L-0020C		Upstream	Downstream
Scenario:	Proposed Condition	Invert: 23.91 ft	Invert: 22.70 ft
From Node:	Node 2	Manning's N: 0.0000	Manning's N: 0.0000
To Node:	Node 1	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: X-0010C	Cross Section: X-0020C
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	1429.56 ft		
Contraction Coef:	0.00		
Expansion Coef:	0.00		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.00 ft		
Energy Switch:	Energy		
Comment:			

Link Min/Max Conditions [Proposed Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0020C	100y-72h	0.05	0.00	0.00	0.15	0.00	0.08
L-0020C	10y-24h	0.00	0.00	0.00	0.00	0.00	0.00
L-0020C	25y-72h	0.00	0.00	0.00	0.00	0.00	0.00

Channel Link: L-0030C		Upstream	Downstream
Scenario:	Proposed Condition	Invert: 21.48 ft	Invert: 22.19 ft
From Node:	Node 3	Manning's N: 0.0000	Manning's N: 0.0000
To Node:	Node 1	Geometry: Irregular	Geometry: Irregular
Link Count:	1	Cross Section: X-0030C	Cross Section: X-0040C
Flow Direction:	Both		
Damping:	0.0000 ft		
Length:	375.98 ft		
Contraction Coef:	0.00		
Expansion Coef:	0.00		
Entr Loss Coef:	0.00		
Exit Loss Coef:	0.00		
Bend Loss Coef:	0.00		
Bend Location:	0.00 ft		
Energy Switch:	Energy		
Comment:			

Link Min/Max Conditions [Proposed Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0030C	100y-72h	9.41	-9.04	-0.31	0.35	1.18	0.64
L-0030C	10y-24h	1.34	-1.99	-0.07	-0.22	1.14	0.62
L-0030C	25y-72h	7.39	-5.93	-0.26	0.33	1.89	1.11

Channel Link: L-0040C

Upstream

Downstream

Scenario:	Proposed Condition	Invert:	22.15 ft	Invert:	22.27 ft
From Node:	Node 6	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	Node 2	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	X-0050C	Cross Section:	X-0060C
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	644.23 ft				
Contraction Coef:	0.00				
Expansion Coef:	0.00				
Entr Loss Coef:	0.00				
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 ft				
Energy Switch:	Energy				

Comment:

Link Min/Max Conditions [Proposed Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0040C	100y-72h	0.02	-20.33	0.07	-0.36	-1.26	-0.69
L-0040C	10y-24h	0.00	-2.03	0.00	-0.18	-1.33	-0.75
L-0040C	25y-72h	0.00	-10.84	-0.04	-0.30	-1.02	-0.65

Channel Link: L-0050C

Upstream

Downstream

Scenario:	Proposed Condition	Invert:	22.51 ft	Invert:	22.33 ft
From Node:	Node 4	Manning's N:	0.0000	Manning's N:	0.0000
To Node:	Node 2	Geometry:	Irregular	Geometry:	Irregular
Link Count:	1	Cross Section:	X-0070C	Cross Section:	X-0080C
Flow Direction:	Both				
Damping:	0.0000 ft				
Length:	948.19 ft				
Contraction Coef:	0.00				

Expansion Coef: 0.00
 Entr Loss Coef: 0.00
 Exit Loss Coef: 0.00
 Bend Loss Coef: 0.00
 Bend Location: 0.00 ft
 Energy Switch: Energy

Comment:

Link Min/Max Conditions [Proposed Condition]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
L-0050C	100y-72h	35.27	-0.08	0.07	0.75	3.44	2.08
L-0050C	10y-24h	3.00	0.00	0.01	0.33	2.23	1.28
L-0050C	25y-72h	19.45	-0.04	-0.05	0.58	3.06	1.82

Simulation: 100y-72h

Scenario: Existing Condition
 Run Date/Time: 6/24/2019 11:27:52 AM
 Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000
	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]	
Min Calculation Time:	30.0000	1.0000	900.0000	
Max Calculation Time:		10.0000		

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph
Folder:

Lookup Tables

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

Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Impervious
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR	IA Recovery Time: 24.0000 hr
Max Iterations: 8	ET for Manual Basins: False
Over-Relax Weight: 0.5 dec	
Fact:	
dZ Tolerance: 0.0010 ft	Smp/Man Basin Rain: Global
	Opt:
Max dZ: 1.0000 ft	OF Region Rain Opt: Global
Link Optimizer Tol: 0.0001 ft	Rainfall Name: ~SFWMD-72
	Rainfall Amount: 12.20 in
Edge Length Option: Automatic	Storm Duration: 72.0000 hr
Dflt Damping (2D): 0.0050 ft	Dflt Damping (1D): 0.0050 ft
Min Node Srf Area: 100 ft2	Min Node Srf Area: 100 ft2
(2D):	(1D):
Energy Switch (2D): Energy	Energy Switch (1D): Energy

Comment:

Simulation: 10y-24h

Scenario: Existing Condition
Run Date/Time: 6/24/2019 11:28:06 AM

Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	30.0000	1.0000	900.0000
Max Calculation Time:		10.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph
Folder:

Lookup Tables

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

Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Impervious
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR	IA Recovery Time: 24.0000 hr
Max Iterations: 8	ET for Manual Basins: False
Over-Relax Weight 0.5 dec	
Fact:	
dZ Tolerance: 0.0010 ft	Smp/Man Basin Rain Global
	Opt:
Max dZ: 1.0000 ft	OF Region Rain Opt: Global
Link Optimizer Tol: 0.0001 ft	Rainfall Name: ~FLMOD
	Rainfall Amount: 6.40 in
Edge Length Option: Automatic	Storm Duration: 24.0000 hr
Dflt Damping (2D): 0.0050 ft	Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 100 ft2	Min Node Srf Area 100 ft2
(2D):	(1D):
Energy Switch (2D): Energy	Energy Switch (1D): Energy

Comment:

Simulation: 25y-72h

Scenario: Existing Condition
 Run Date/Time: 6/24/2019 11:28:22 AM
 Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	30.0000	1.0000	900.0000
Max Calculation Time:		10.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
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Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph
Folder:

Lookup Tables

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

Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Impervious
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 8
Over-Relax Weight: 0.5 dec
Fact:
dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

Dflt Damping (2D): 0.0050 ft
Min Node Srf Area: 100 ft2
(2D):
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False

Smp/Man Basin Rain: Global
Opt:
OF Region Rain Opt: Global
Rainfall Name: ~SFWMD-72
Rainfall Amount: 9.80 in
Storm Duration: 72.0000 hr

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

Comment:

Simulation: 100y-72h

Scenario: Proposed Condition
 Run Date/Time: 6/24/2019 11:28:42 AM
 Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	30.0000	1.0000	900.0000
Max Calculation Time:		10.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
 Reference ET Folder:
 Unit Hydrograph
 Folder:

Lookup Tables

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

Green-Ampt Set:
 Vertical Layers Set:
 Impervious Set: Impervious
 Roughness Set:
 Crop Coef Set:
 Fillable Porosity Set:

Conductivity Set:

Leakage Set:

Tolerances & Options

Time Marching: SAOR	IA Recovery Time: 24.0000 hr
Max Iterations: 8	ET for Manual Basins: False
Over-Relax Weight 0.5 dec	
Fact:	
dZ Tolerance: 0.0010 ft	Smp/Man Basin Rain Global
	Opt:
Max dZ: 1.0000 ft	OF Region Rain Opt: Global
Link Optimizer Tol: 0.0001 ft	Rainfall Name: ~SFWMD-72
	Rainfall Amount: 12.20 in
Edge Length Option: Automatic	Storm Duration: 72.0000 hr
Dflt Damping (2D): 0.0050 ft	Dflt Damping (1D): 0.0050 ft
Min Node Srf Area 100 ft2	Min Node Srf Area 100 ft2
(2D):	(1D):
Energy Switch (2D): Energy	Energy Switch (1D): Energy

Comment:

Simulation: 10y-24h

Scenario: Proposed Condition
 Run Date/Time: 6/24/2019 11:29:18 AM
 Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	30.0000	1.0000	900.0000
Max Calculation Time:		10.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph
Folder:

Lookup Tables

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

Green-Ampt Set:
Vertical Layers Set:
Impervious Set: Impervious
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 8
Over-Relax Weight: 0.5 dec
Fact:
dZ Tolerance: 0.0010 ft

Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft

Edge Length Option: Automatic

Dflt Damping (2D): 0.0050 ft
Min Node Srf Area: 100 ft2
(2D):
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False

Smp/Man Basin Rain: Global
Opt:
OF Region Rain Opt: Global
Rainfall Name: ~FLMOD
Rainfall Amount: 6.40 in
Storm Duration: 24.0000 hr

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

Comment:

Simulation: 25y-72h

Scenario: Proposed Condition
 Run Date/Time: 6/24/2019 11:29:36 AM
 Program Version: ICPR4 4.05.01

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	96.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	30.0000	1.0000	900.0000
Max Calculation Time:		10.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	360.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
 Reference ET Folder:
 Unit Hydrograph
 Folder:

Lookup Tables

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

Green-Ampt Set:
 Vertical Layers Set:
 Impervious Set: Impervious
 Roughness Set:
 Crop Coef Set:
 Fillable Porosity Set:

Conductivity Set:

Leakage Set:

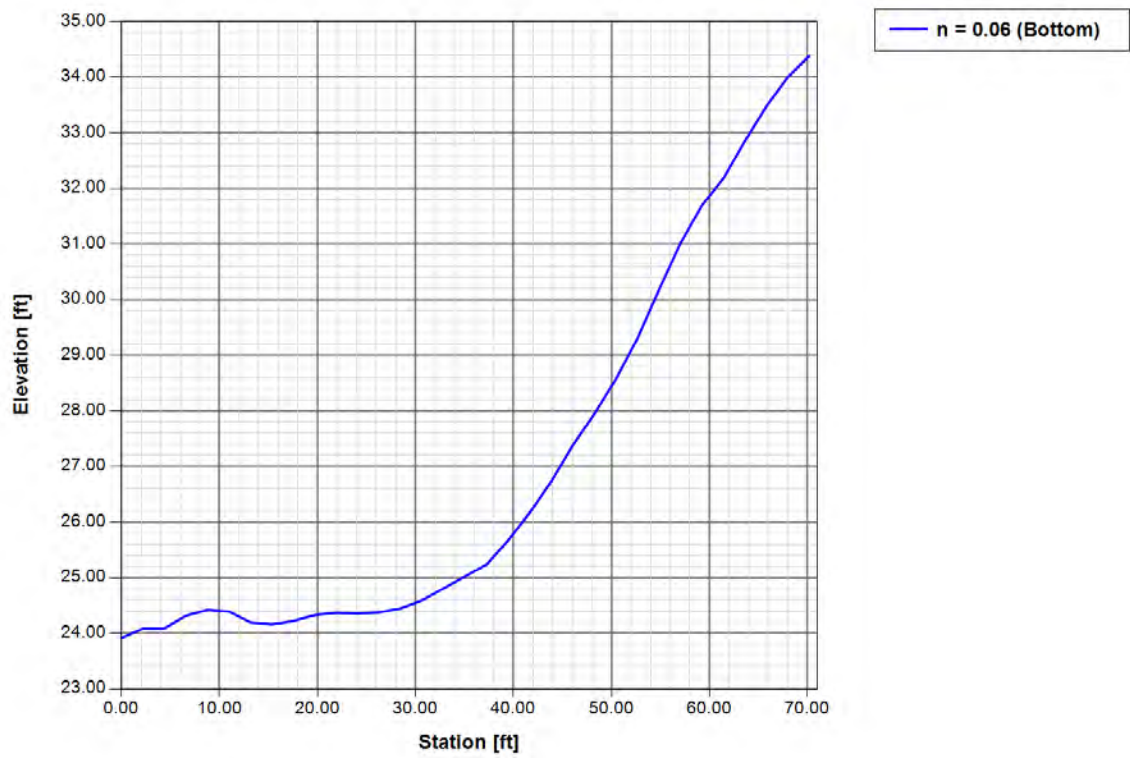
Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	8	ET for Manual Basins:	False
Over-Relax Weight	0.5 dec		
Fact:			
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain	Global
		Opt:	
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	9.80 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area	100 ft2	Min Node Srf Area	100 ft2
(2D):		(1D):	
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

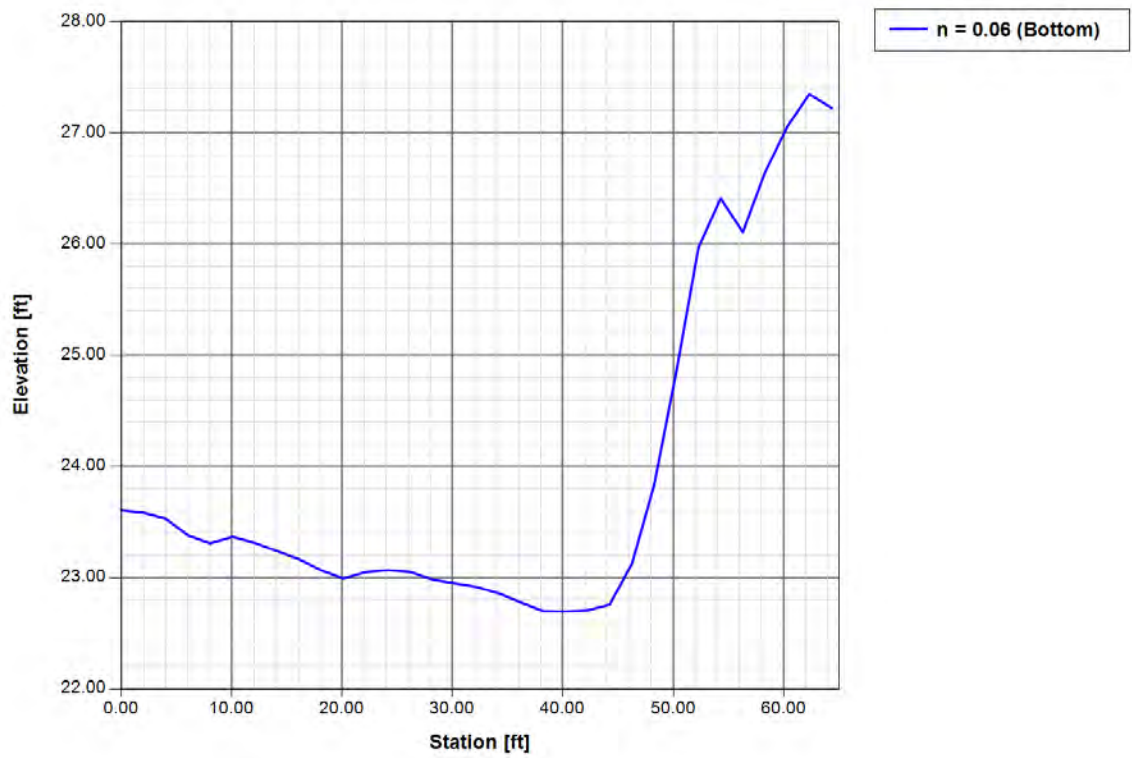
Channel Cross Section: X-0010C

Scenario: X-0010C



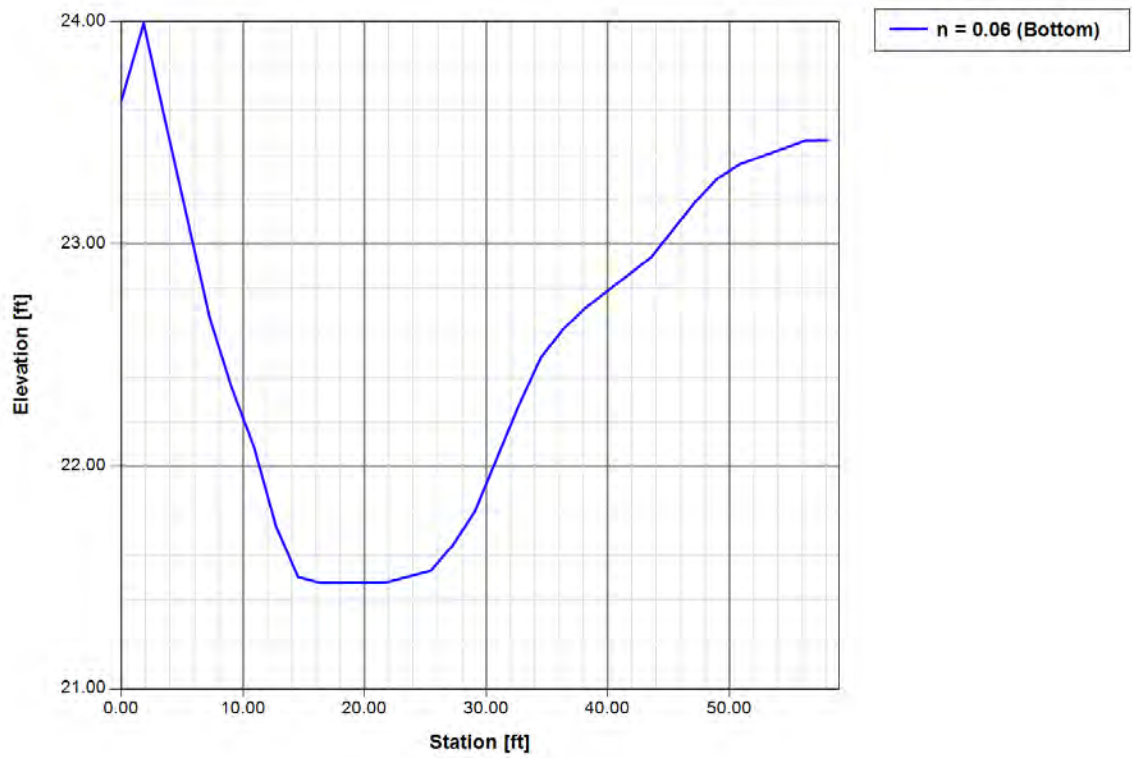
Channel Cross Section: X-0020C

Scenario: X-0020C



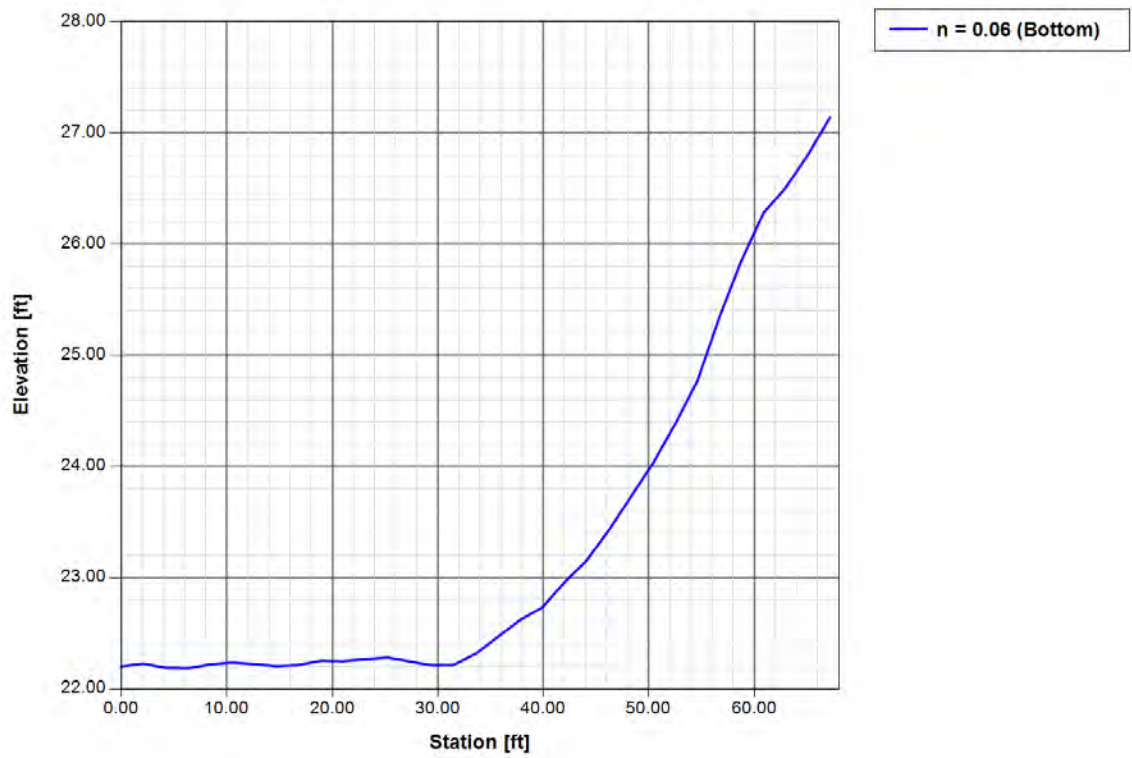
Channel Cross Section: X-0030C

Scenario: X-0030C



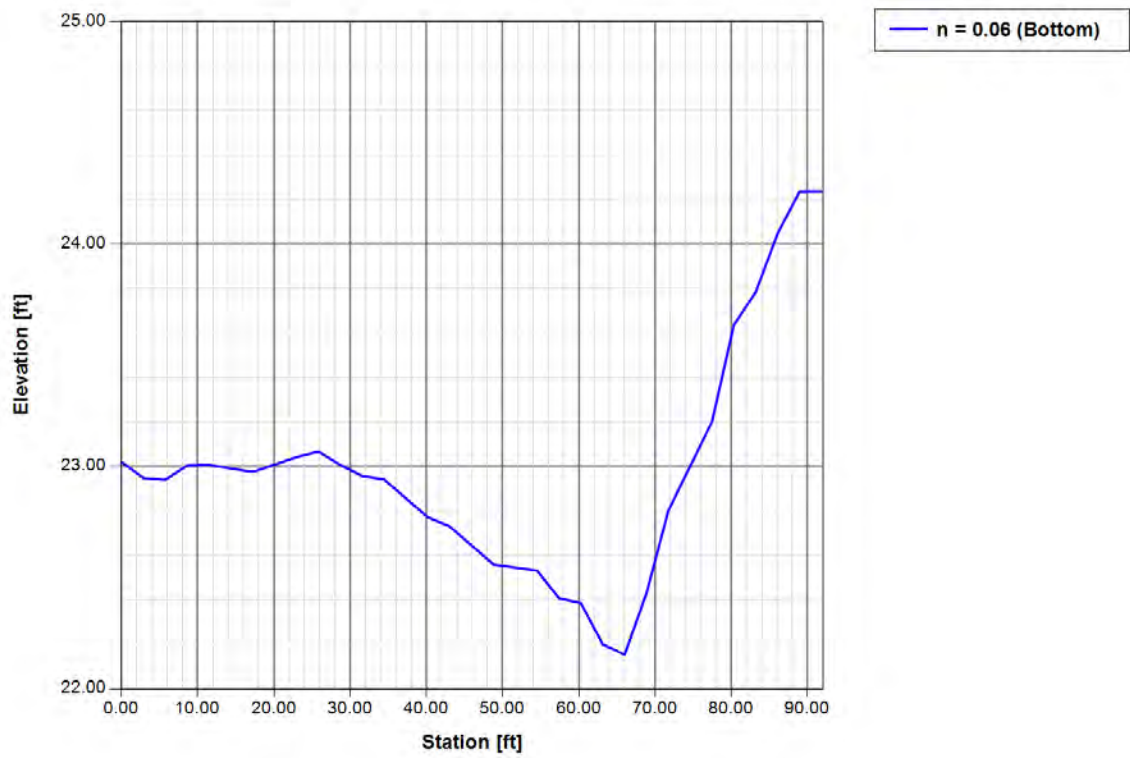
Channel Cross Section: X-0040C

Scenario: X-0040C



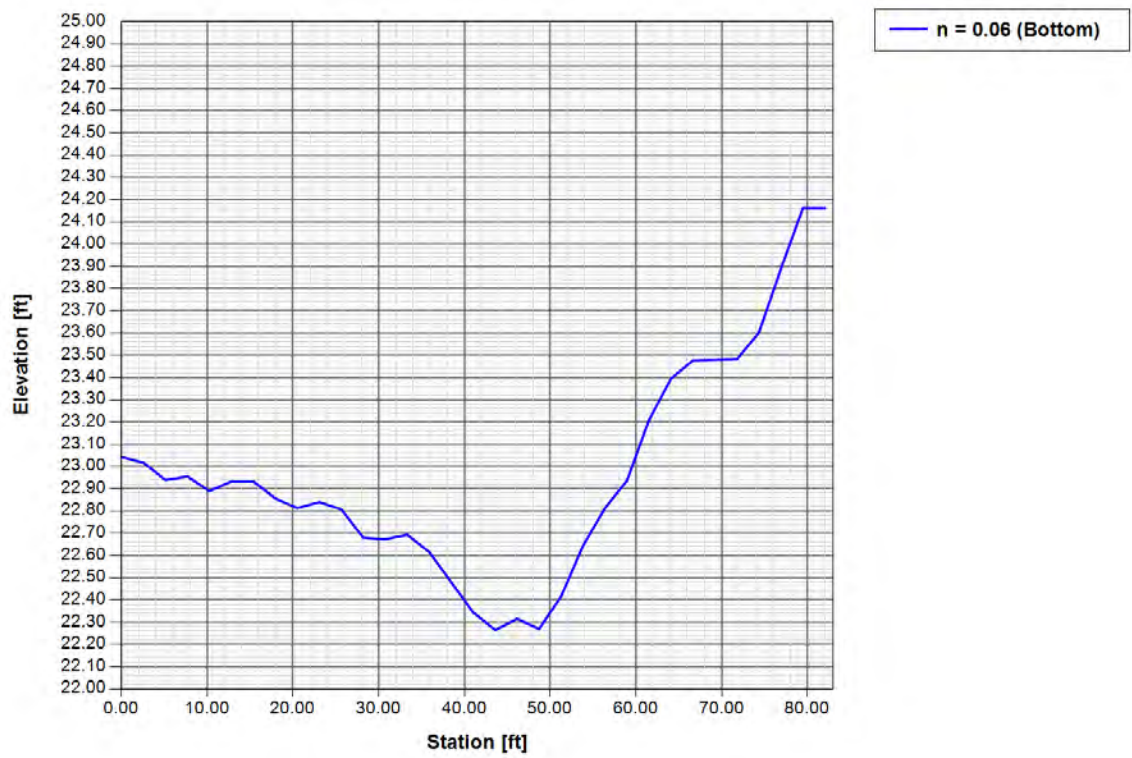
Channel Cross Section: X-0050C

Scenario: X-0050C



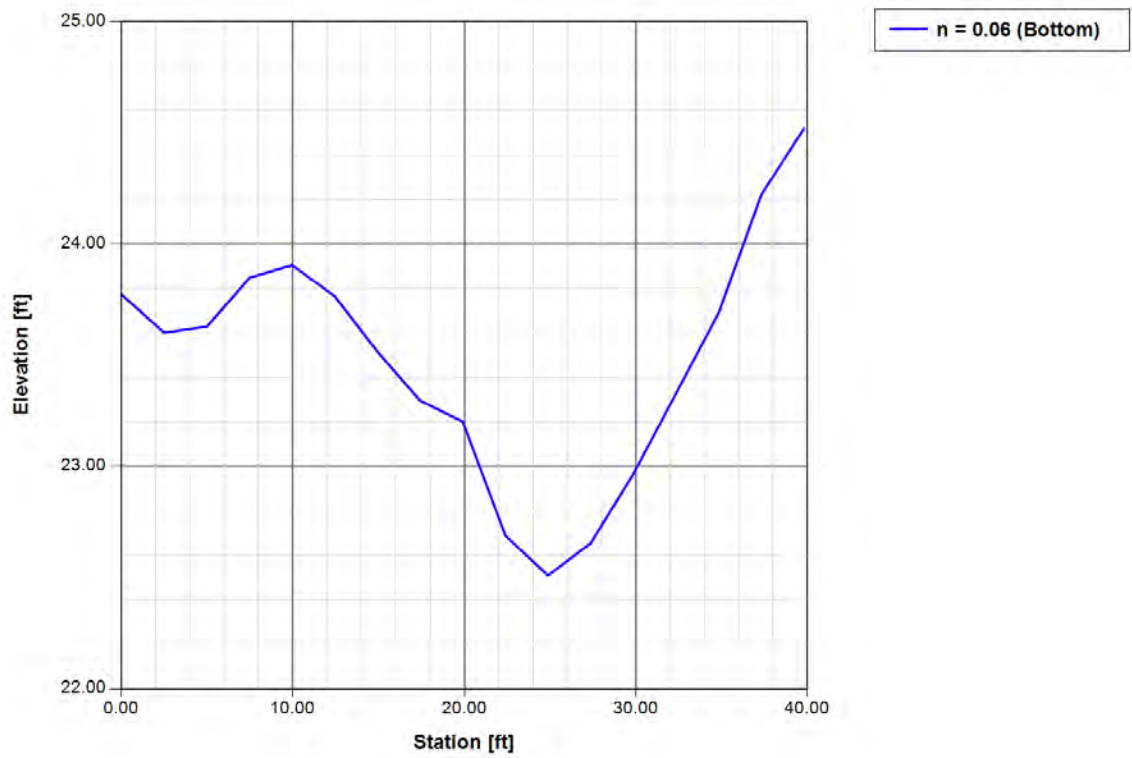
Channel Cross Section: X-0060C

Scenario: X-0060C



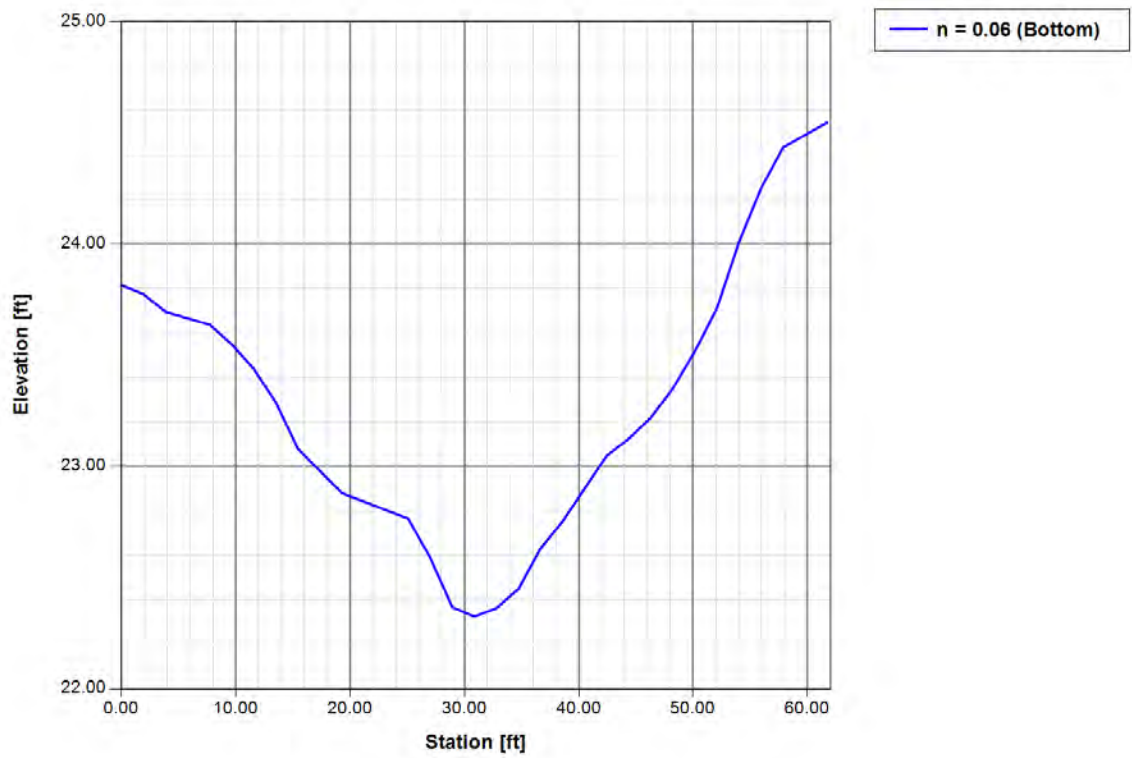
Channel Cross Section: X-0070C

Scenario: X-0070C



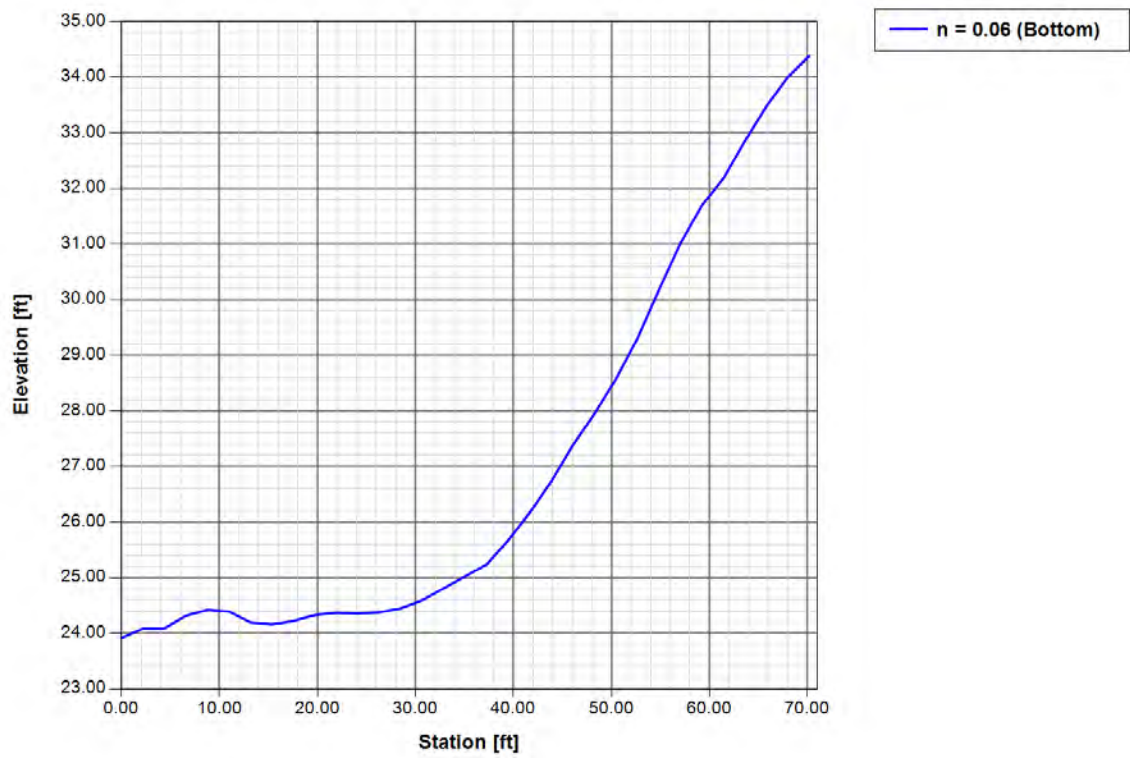
Channel Cross Section: X-0080C

Scenario: X-0080C



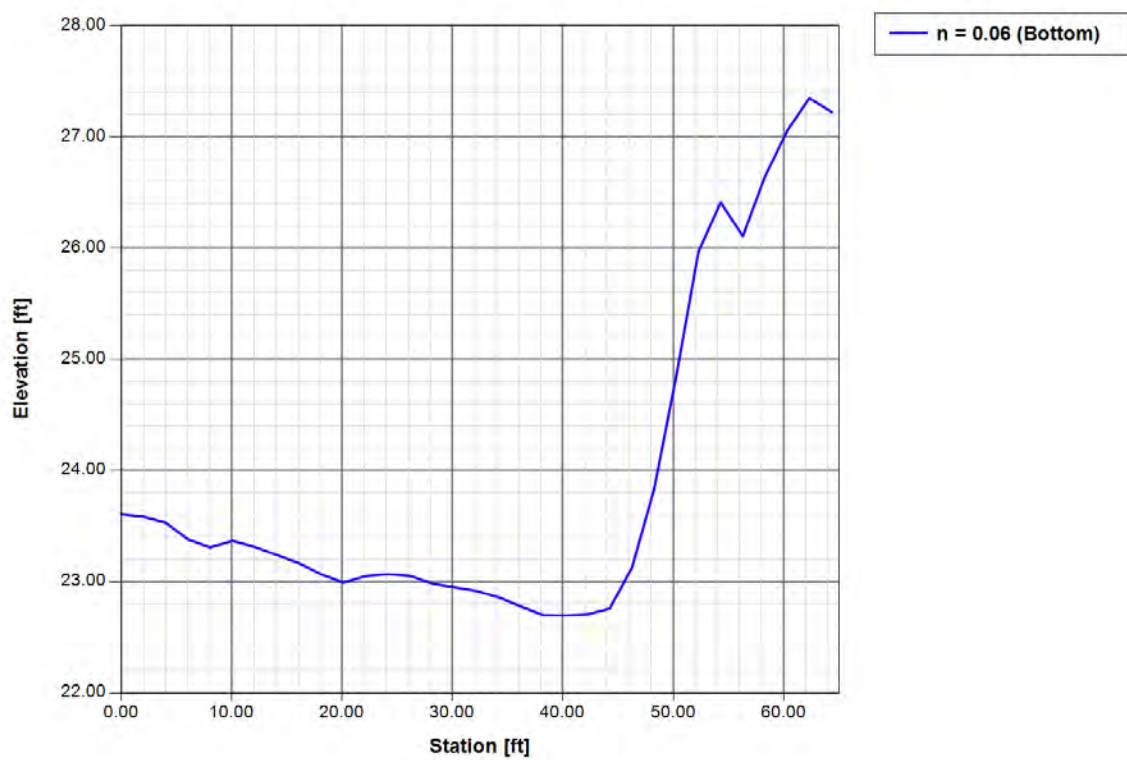
Channel Cross Section: X-0010C

Scenario: X-0010C



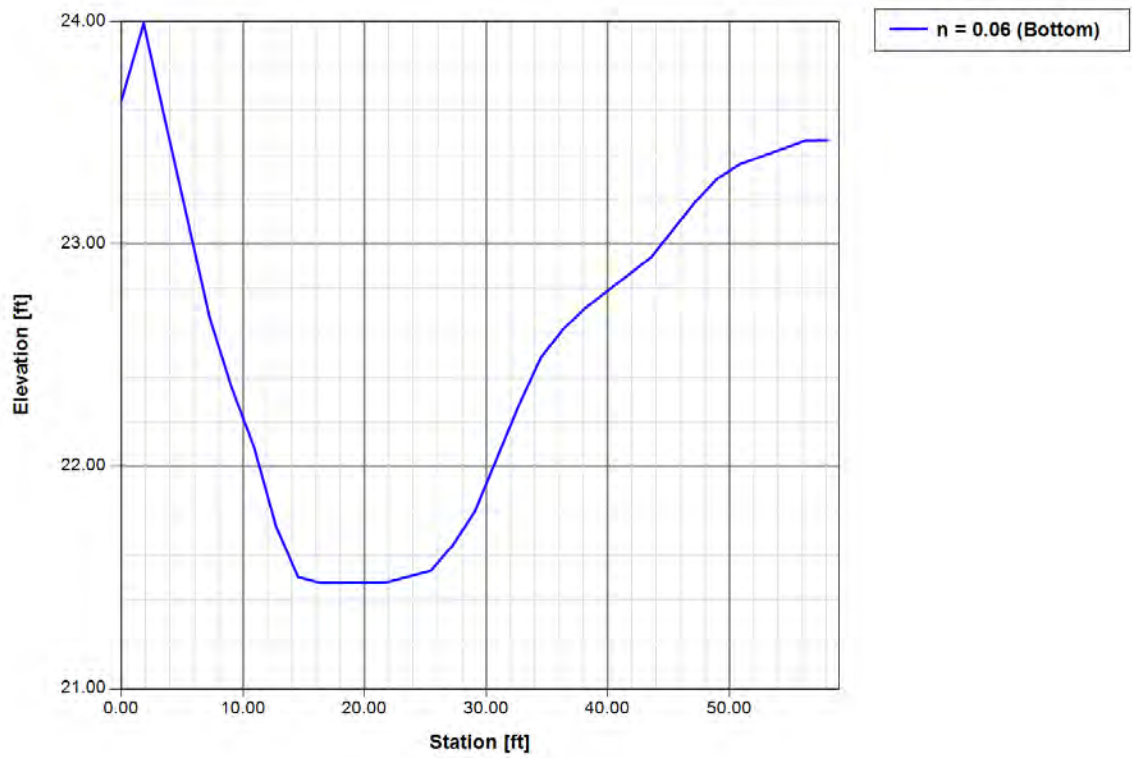
Channel Cross Section: X-0020C

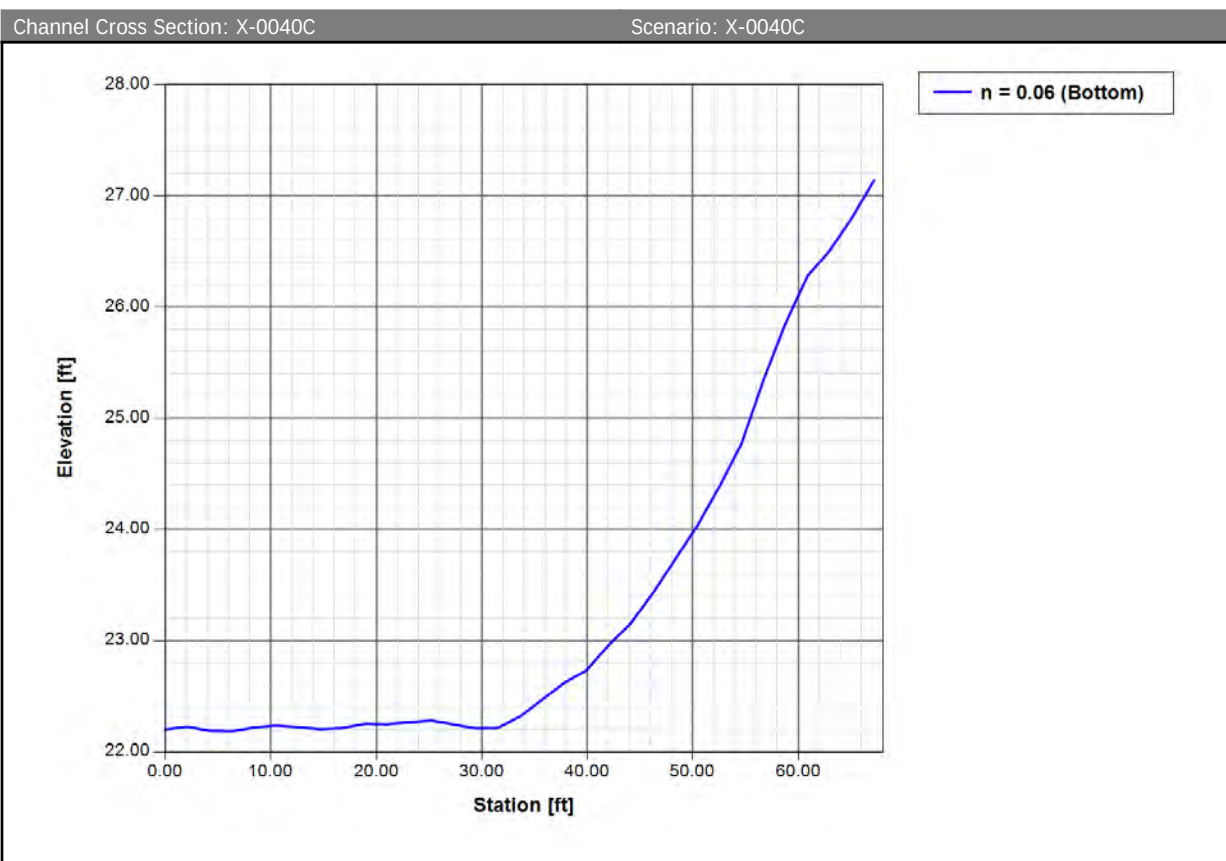
Scenario: X-0020C



Channel Cross Section: X-0030C

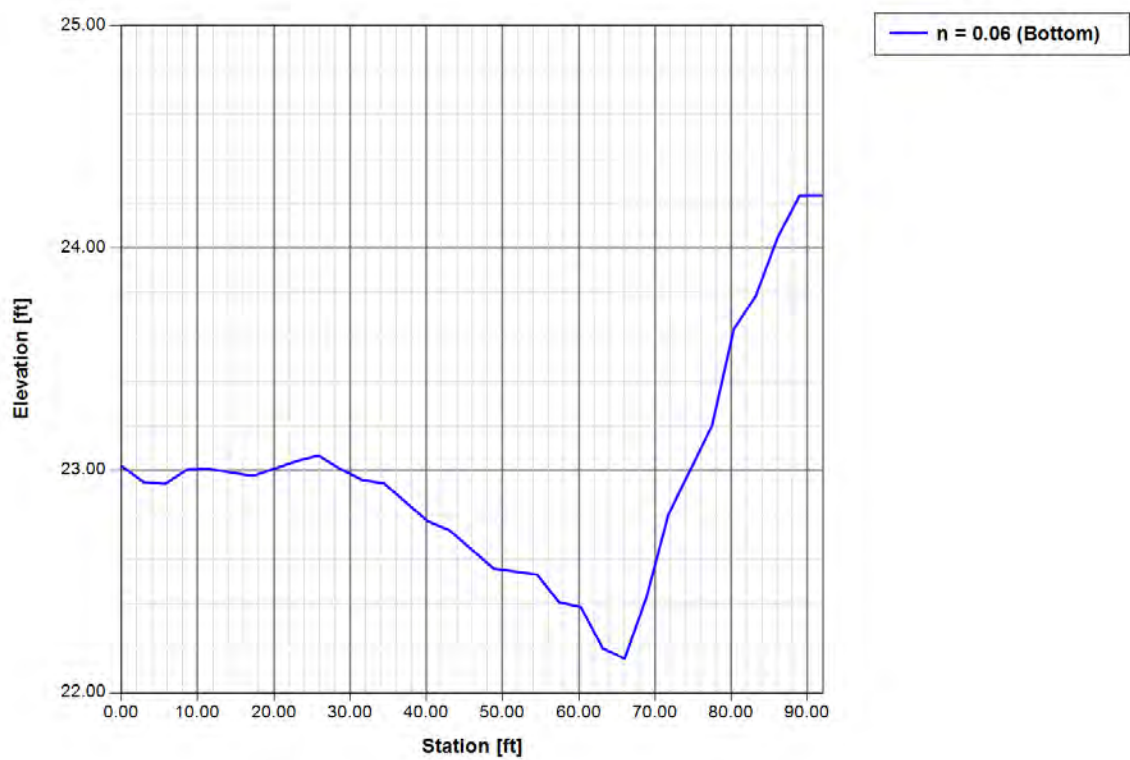
Scenario: X-0030C





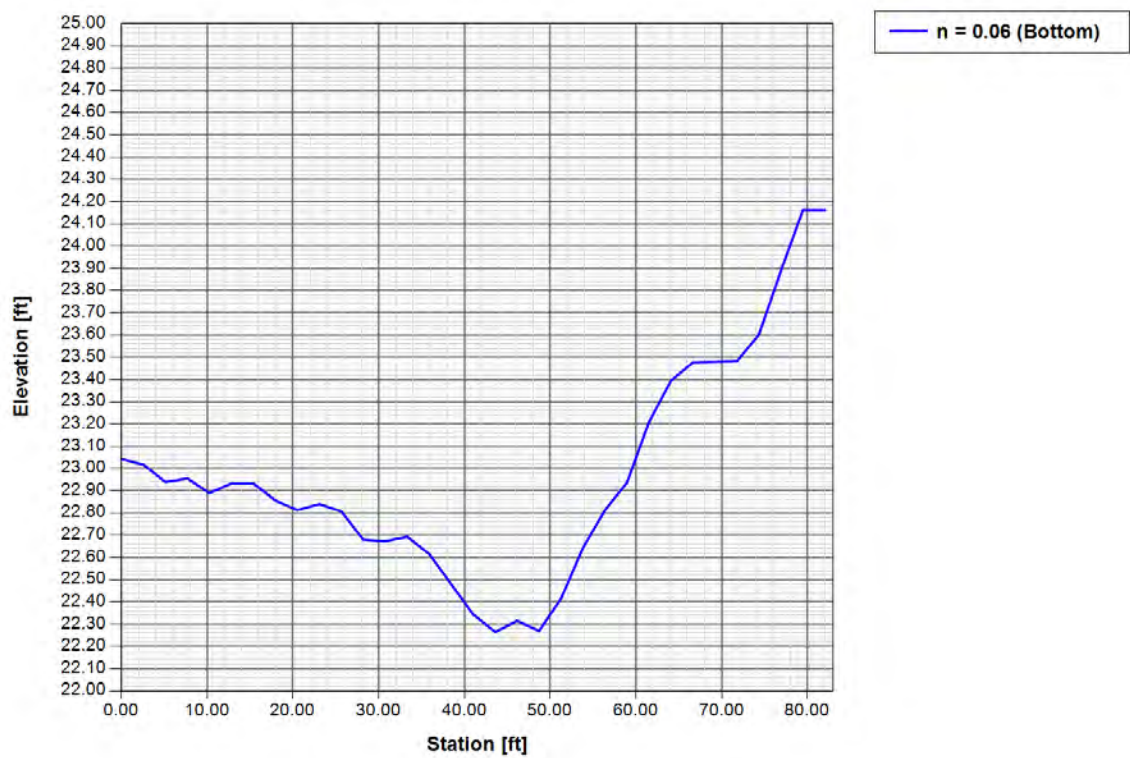
Channel Cross Section: X-0050C

Scenario: X-0050C



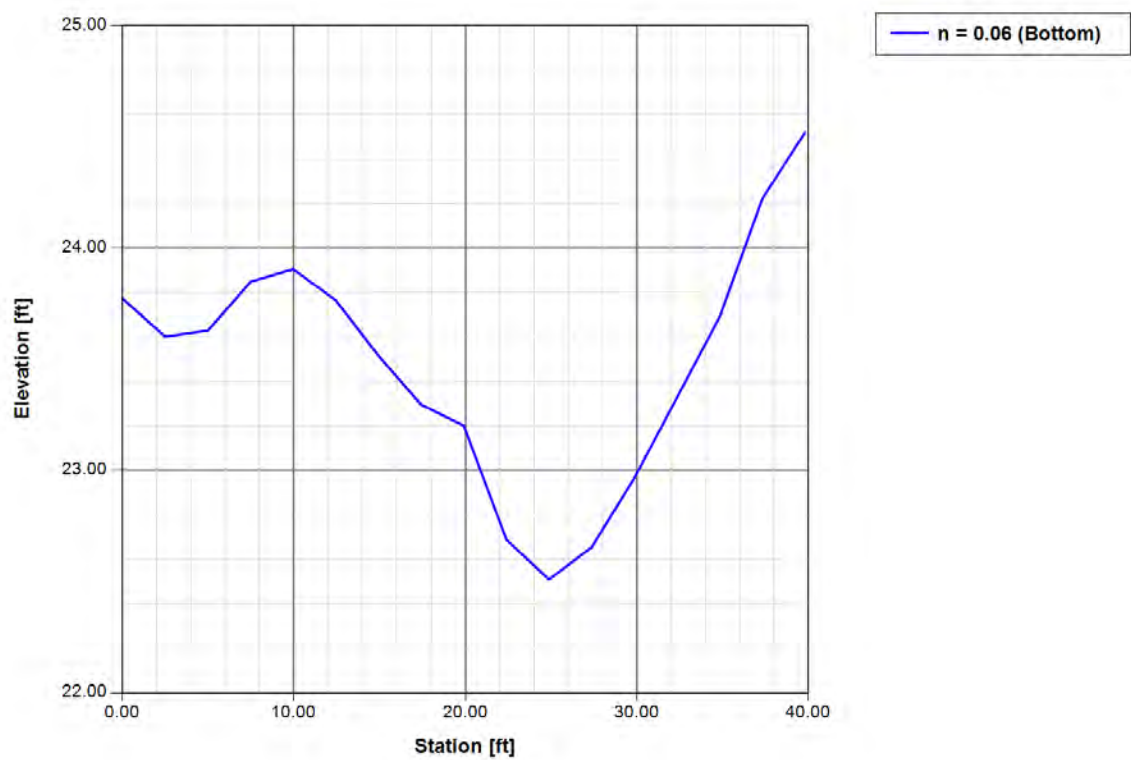
Channel Cross Section: X-0060C

Scenario: X-0060C



Channel Cross Section: X-0070C

Scenario: X-0070C



Channel Cross Section: X-0080C

Scenario: X-0080C

