Continued to May 18, 2023 mtg

CITY OF OKEECHOBEE

Application for Site Plan Review

City of Okeechobee
General Services Department
55 S.E. 3rd Avenue, Room 101
Okeechobee, Florida 34974
Phone: (863) 763-3372, ext. 9820
Fax: (863)763-1686
E-mail: pburnette@cityofokeechobee.com

Date Received	12-20-22 4PM
Application No.	23-001-TRC
Fee Paid:	$ 1126.96
Receipt No.	59108
Hearing Date:	2-16-23

	APPLICANT INFORMATION
1	Name of property owner(s): Glenwood Park, LLC
2	Owner mailing address: 17705 Middlebrook Way, Boca Raton, FL 33496
3	Name of applicant(s) if other than owner:
4	Applicant mailing address: ~~Steven Dobbs~~ F. Mitchell Stephens
5	Name of contact person (state relationship): ~~Engineer~~ Steven Dobbs
6	Contact person daytime phone(s) and email address: 863-824-7644 - sdobbs@stevedobbsengineering.com
7	Engineer: Name, address and phone number: Steven L. Dobbs, LLC - 1062 Jakes Way, Okeechobee, FL 34974 863-824-7644
8	Surveyor: Name, address and phone number: BSM and Associates - 80 31st Lane, Okeechobee, FL 34974 - 863-484-8324
	PROPERTY and PROJECT INFORMATION
9	Property address/directions to property: 309 NE 4th Street, Okeechobee, FL 34974 - from 441/70 intersection proceed north on 441 turn right at NE 4th Street, just past NE 2nd Avenue the parcels on the north and south are part of the project
10	Parcel Identification Number 3-15-37-35-0010-01100-0010 and 3-15-37-35-0010-01210-0010
11	Current Future Land Use designation: Multi - Family Residential
12	Current Zoning district: Residential Multiple Family
13	Describe the project including all proposed uses, type of construction and conceptual building layout, how the business or use is expected to operate on the site, including but not limited to: number of employees expected; hours of operation; location, extent and type of any outdoor storage or sales, etc., and fire flow layout. Use additional page if necessary. The owner proposes construction of 28 Multi family rental units with associated parking. The project will be served by a dry detention stormwater collection system. The water and sewer will be served by the Okeechobee utility Authority.
14	Describe existing improvements on property (for example, the number and type of buildings, dwelling units, occupied or vacant, etc.). Use additional page if necessary. Both parcels are vacant
15	Total land area in square feet (if less than two acres): or acres: 4.24
16	Is proposed use different from existing or prior use (X Yes) (__ No)

17	Number and description of phases: This project will be broken up into 2 phases, the first phase will be block 110 and the second phase will be block 121.
18	Source of potable water: OUA
19	Method of sewage disposal: OUA

		ATTACHMENTS REQUIRED FOR ALL APPLICATIONS
✓	20	Applicant's statement of interest in property Owner
✓	21	One (1) copy of last recorded warranty deed
	22	Notarized letter of consent from property owner (if applicant is different from property owner)
✓	23	**Three (3) CERTIFIED BOUNDARY and TOPOGRAPHIC** surveys, (one to be no larger than 11 x 17; scale not less than one inch to 20 feet; North point) containing: a. Date of survey, surveyor's name, address and phone number b. Legal description of property pertaining to the application c. Computation of total acreage to nearest tenth of an acre d. Location sketch of subject property, and surrounding area within one-half mile radius
✓	24	Two (2) sets of aerials of the site.
✓	25	Eleven (11) copies of sealed site plan drawings (see attached checklist for details of items to be included)
✓	26	Eleven (11) copies of drawing indicating facades for all buildings, including architectural elevations.
✓	27	Eleven (11) copies of landscape plan, including a separate table indicating the number of trees and shrubs by type and showing both the official and common name of each type of tree and shrub.
?	28	Eleven (11) copies of photometric lighting plan (see Code of Ordinances & LDR's Section 78-71 (A) (5)).
✓	29	Three (3) copies of sealed drainage calculations.
✓	30	Attach a Traffic Impact Study prepared by a professional transportation planner or transportation engineer, if the rezoning or proposed use will generate 100 or more peak hour vehicle trip ends using the trip generation factors for the most similar use as contained in the Institute of Transportation Engineers most recent edition of Trip Generation. The TIA must identify the number of net new external trips, pass-bay calculations, internal capture calculations, a.m. and p.m. peak hour trips and level of service on all adjacent roadway links with and without the project.
✓	31	USB flash drive of application
✓	32	Nonrefundable application fee: $1,000.00 plus $30.00 per acre. **NOTE: Resolution** No. **98-11 Schedule of Land Development Regulation Fees and Charges - When the cost for advertising, publishing and mailing notices of public hearings exceeds the established fee, or when a professional consultant is hired to advise the City on the application, the applicant shall pay the actual costs.**

NOTE: **Submissions will be reviewed by the General Services Coordinator and City Planner for all necessary documentation. The Applicant will be notified at least 10 days prior to the TRC meeting whether or not additional information is required to proceed or if the review will be rescheduled to the next TRC meeting.**

Confirmation of Information Accuracy

I hereby certify that the information in this application is correct. The information included in this application is for use by the City of Okeechobee in processing my request. False or misleading information may be punishable by a fine of up to $500.00 and imprisonment of up to 30 days and may result in the summary denial of this application.

✓ Frank Mitchell Stephens — Frank Mitchell Stephens — June 6, 2022

Signature | Printed Name | Date

For questions relating to this application packet, call the General Services Dept. at (863) 763-3372, Ext. 9820

CITY OF OKEECHOBEE

Application for Site Plan Review

City of Okeechobee
Checklist for Site Plan Review

	REQUIRED INFORMATION
1	Completed application (1)
2	Map showing location of site (may be on the cover sheet of site plan)
3	Eleven (11) copies of sealed site plan drawings prepared at a scale no smaller than one inch equals 60 feet, or in the case of small projects, the largest scale that can accommodate the entire site and all areas within 50 feet of the project boundary, and the scale, legend, and author block all on one 24" by 36" sheet. The site plan drawings shall include the location of all existing and proposed improvements, including, but not limited to:
	3.1 Water courses, water bodies, floodplains, wetlands, important natural features and wildlife areas, soil types, protected trees and vegetation or environmentally sensitive areas
	3.2 Streets, sidewalks, property lines and rights-of-way
	3.3 Utility lines/facilities, fire hydrants, septic tanks and drainfields
	3.4 Bridges, culverts and stormwater management facilities
	3.5 Buildings and structures and their distances from boundaries of the property, streets, and other structures
	3.6 Setback lines and required yards
	3.7 Ingress and egress to the site and buildings
	3.8 Vehicular use areas including off-street parking and loading areas
	3.9 On-site recreation and open space
	3.10 Landscaping, screens, buffers, walls, and fences,
	3.11 Method of solid waste collection and locations of and access to dumpsters
	3.12 Lighting and signs
4	Drawing notes and tabulations showing the following information shall be included along with the plan:
	4.1 Name, address and phone number of the owner
	4.2 Name, address and phone number of any agent, architect, engineer and planner
	4.3 Compete legal description of the property
	4.4 Future land use designation, current zoning and existing land use of the property and all abutting properties
	4.5 Total acreage of the property (square footage if less than two acres)
	4.6 Total # of dwelling units, by bedroom size; square footage of nonresidential uses by type of use (and/or seating, etc. as necessary to indicate the intensity)
	4.7 Number of off-street parking spaces provided (including handicapped spaces) and loading spaces and the calculation of, and basis for, the number of such spaces required by the Land Development Regulations
	4.8 Impervious surface calculations showing: the square footage and as a% of the total site for existing impervious surfaces, additional proposed impervious surfaces and the resulting proposed total impervious surfaces

March 31, 2023

City of Okeechobee

Job No.: **FL22024 - Glenwood**
Subject: **23-001-TRC RAI Engineering Review**

Dear Reviewer:

Below are responses to the Request for Additional Information based on the Engineering Review Comments from January 19, 2023, for the above referenced permit application. The following conditions are in regular type and responses are in *italics*.

Sec 78-36 – Sidewalks, driveways, and pedestrian access.

1. Provide typical design width on plans for sidewalks. Provide cross walk striping details and detectable warning strips for proposed sidewalks.

   Plans have been updated to include dimensions, striping details and detectable warning strips for proposed sidewalks.

2. Address potential drop from sidewalk crossing to existing inlet at corner of NE 3rd AVE and NE 4th ST.

   According to the 2018 FDOT Greenbook, we are neither 10" lower within 2' at 3:1 slope (8") or 60" with a slope greater than 2:1, so we should meet this criteria.

3. Provide for Sidewalk location in Typical Section B-B. Include provision for minimum clear graded area to avoid edge drop off to proposed swale.

   Typical Section B-B has been updated to clarify the clear graded area so that there will be no edge drop off into the proposed swale.

Sec. 86-182 – (e)

4. Common detention areas for subdivision should be depicted as "general purpose areas" outside of the proposed lots.

   The detention areas are covered by a drainage easement within the proposed subdivision and would be a part of the HOA duties, if ever subdivided.

209 NE 2nd Street, Okeechobee, FL 34972
Phone: (863) 824-7644 **Cell:** (863) 634-0194
Email: sdobbs@stevedobbsengineering.com **Website:** www.SteveDobbsEngineering.com

5. Provide locations on plan view of sheets 301-C302 for typical cross section A-A

Section A-A has been depicted on the plan sheets.

Sec. 8c-185 – Wastewater and water

6. Provide horizontal dimensions between proposed water and sewer mains.

Plans have been updated to show dimensions between proposed water and sewer mains.

7. Provide additional details and criteria for proposed sewer design including lift station details.

Additional details have been added for the proposed sewer design including the lift station details.

8. Manhole details are provided in details; however, manholes are not provided in the design. Please address.

The manhole detail has been removed from the plan set.

9. Provide proposed sanitary sewer easement for maintenance of system on future lots.

The easement has been added to the plan.

10. Provide force main design from lift station to point of connection to existing system.

The design has been added to the plans.

11. Proposed sewer mains appear to be in conflict with proposed landscape buffers.

The sewer line will be below the landscape buffers with cleanouts every 75', this should not be in conflict with the landscape buffer.

12. Does proposed 8" water main connect to existing 6" water main on NE 4th Street?

Plans have been updated to show the detail of the proposed connection of the water main on NE 4th Street.

13. Fire Hydrant at NE 3rd AVE and NE 5th Street appears to be located within proposed sidewalk. Please address.

Fire Hydrant location has been adjusted on the update plans.

14. Will duplex/2 family buildings need separate water meters?

Each duplex will have 2 water meters, one for each side of the building. This will provide for best service to each unit.

15. Provide details for proposed water service connections to 16" water main on NE 2nd Ave

The details have been added.

16. Provide details for water main crossing of NE 4th ST. (Direction bore, jack and bore, casing, open cut with pavement restoration, horizontal separation from existing storm, etc.)

These details have been added.

17. Prior to construction commencement, provide a sewage collection/transmission system construction permit from Florida Department of Environmental Protection and approval from local sewer authority.

Prior to construction we will provide the copy of the approved construction permit from the Florida Department of Environmental Protection and approval from Okeechobee Utility Authority.

18. Prior to construction commencement, provide a water main extension construction permit from Florida Department of Environmental Protection and approval from local water authority.

Prior to construction we will provide the copy of the approved construction permit from the Florida Department of Environmental Protection and approval from Okeechobee Utility Authority.

Sec. 86-184 – Bridges and culverts.

19. Proposed Driveway culverts on NE 2nd Ave appear to conflict with existing 16" water main.

The culverts have been relocated.

20. Proposed culverts on south side of NE 4th street appear to conflict with existing 5' storm drain. Please address. Have alternate designs to connect to 5' storm drain been considered? Provide invert and end treatment details for control structure connections to proposed roadside swales on NE 4th Street.

The culverts

21. Provide minimum pipe coverage details per FDOT Standards for proposed CMP culverts under proposed asphalt within public right-of-way.

The FDOT minimum clearance has been added to the plans.

22. Please provide details for culvert end treatments for culverts under proposed sidewalks.

Each should receive a MES that is in the details.

23. Provide additional details for proposed culverts and existing culverts at the corner of NE 5th ST and NE 3rd AVE

The details have been added to the plans.

24. Invert of proposed sidewalk culvert at NE 4th ST and NE 3rd AVE appears lower than RIM elevation of existing storm drain of 18" RCP to south.

The inverts have been adjusted.

25. Proposed Driveway culvert on NE 4th street appears to conflict with existing storm drain. Please address

The culvert has been adjusted.

26. Provide minimum pipe coverage details for proposed CMP culverts under proposed asphalt within public right-of-way

Not sure if this is a duplicate comment, but please see item 21.

Sec. 34-2 – Fire hydrants.

27. Provide correspondence from Fire Marshall that the location and number of fire hydrants as proposed are sufficient for the development.

The Fire Reviewer was at TRC and said the placement of the fire hydrants was sufficient for the project.

Sec. 78-101 – Requirements.

28. Please ensure that the placement of the silt fence follows the requirements of the "Florida Stormwater, Erosion and Sediment Control Inspector's Manuals".

The silt fence has been relocated.

29. The written report states that pavement areas will pass through the dry detention areas. Please confirm that unpaved areas will pass through the dry detention areas as well. (The Storm CAD model appears to indicate that all water from each of the developed blocks will be routed through the stormwater pond.)

Each block will be surrounded by a perimeter berm that will ensure all water from impervious and pervious areas will pass through the dry detention area.

30. Please indicate how site grading and or drainage infrastructure will route water to the ponds.

Each parking area is graded to shed water away from the driveway so the water will

be captured inside the perimeter berm of each block and swales on each property line will ensure the water will be directed to the dry detention area.

31. The control elevation for BLOCK 110 is listed as 23.0 and the proposed pond bottom elevation is listed as 23.33, SFWMD requires a dry pond bottom to be 1' higher than the control elevation for the site. Please address.

The SFMWD required the bottom of the pond to be 1' above the wet season water table which it is the remainder of the volume would be considered retention, but with such a small distance the system will recover to wet season water table within the 12 day recovery period.

32. The control elevation for BLOCK 121 is listed as 24.0 and the proposed pond bottom elevation is listed as 24.33, SFWMD requires a dry pond bottom to be 1' higher than the control elevation for the site. Please address.

The SFMWD required the bottom of the pond to be 1' above the wet season water table which it is the remainder of the volume would be considered retention, but with such a small distance the system will recover to wet season water table within the 12 day recovery period.

33. Under the allowable discharge calculation on the second page of the report pdf, the Block 121 project acreage is listed as 2.20 acres. Total Basin Acreage on sheet 6 of your drainage report lists the total Basin Acreage as 2.17 acres. Please clarify.

These area now match in each area of the report.

34. At the bottom of the second page in the drainage report is a statement that says "Since the proposed water quality system is dry detention, the volume required is 100% of the calculated volume." Please be advised that the dry pond water quality volume requirement is 75% of the requirement for water quality being provided by a wet pond.

This has been corrected.

35. Section B Water Quantity on page 3 of the drainage report states "The actual maximum discharge rate for the 10-year, 72-hour storm event was calculated and shown below, which is within tolerance of the maximum allowable peak rate. To demonstrate conformance to this criterion, the proposed project was flood-routed using WaterCAD." Was this referring to the 25-year event instead?

This has been corrected.

36. Nutrient Loading: Please provide a site-specific pollutant loading analysis. If retention is required to meet pollutant loading goals, please ensure retention areas are compliant with a 72 hour drawdown requirement.

Nutrient loading analysis from the BMPTrains model has been added to the drainage calculations.

37. Please demonstrate the tailwater assumptions used in the WaterCAD model. Consider that Block 110 swale as an invert elevation of 23.3 and an eop elevation of 25.7 within the vicinity of CS-1.

I understand the concern, but even of the dry detention area does not start to drain until hour 72, which would most likely be the peak tailwater elevation and would recover quickly with full culvert discharge and no indication of perched water tables in the vicinity, the dry detention area would start to discharge at hour 72 and if you add the discharge from the beginning of the discharge at hour 45 and add it onto the end of the recovery at hour 90, the dry detention area would still recover by hour 117, which is still well within the SFWMD 288 hour recovery time.

38. Please demonstrate the tailwater assumptions used in the WaterCAD model. Consider that Block 121 swale as an invert elevation of 24.3 and an eop elevation of 25.8 within the vicinity of CS-2.

I understand the concern, but even of the dry detention area does not start to drain until hour 72, which would most likely be the peak tailwater elevation and would recover quickly with full culvert discharge and no indication of perched water tables in the vicinity, the dry detention area would start to discharge at hour 72 and if you add the discharge from the beginning of the discharge at hour 45 and add it onto the end of the recovery at hour 90, the dry detention area would still recover by hour 117, which is still well within the SFWMD 288 hour recovery time.

If you should have additional question or require more information, please do not hesitate to contact me.

Sincerely,

Steven L. Dobbs, P. E.
President

Complete Report (not including cost) Ver 4.3.5

Project: FL22024
Date: 31/03/2023 08:10:11 a. m.

Site and Catchment Information

Analysis: BMP Analysis

Catchment Name	BLOCK 110	BLOCK 121
Rainfall Zone	Florida Zone 2	Florida Zone 2
Annual Mean Rainfall	50.00	50.00

Pre-Condition Landuse Information

Landuse	Undeveloped - Upland Hardwood: TN=1.042 TP=0.346	Undeveloped - Upland Hardwood: TN=1.042 TP=0.346
Area (acres)	2.26	2.35
Rational Coefficient (0-1)	0.00	0.00
Non DCIA Curve Number	29.90	29.90
DCIA Percent (0-100)	0.00	0.00
Nitrogen EMC (mg/l)	1.042	1.042
Phosphorus EMC (mg/l)	0.346	0.346
Runoff Volume (ac-ft/yr)	0.018	0.019
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	0.024	0.025
Phosphorus Loading (kg/yr)	0.008	0.008

Post-Condition Landuse Information

Landuse	Single-Family: TN=2.070 TP=0.327	Single-Family: TN=2.070 TP=0.327
Area (acres)	2.26	2.35
Rational Coefficient (0-1)	0.16	0.15
Non DCIA Curve Number	84.73	84.24
DCIA Percent (0-100)	0.00	0.00

Wet Pond Area (ac)	0.00	0.00
Nitrogen EMC (mg/l)	2.070	2.070
Phosphorus EMC (mg/l)	0.327	0.327
Runoff Volume (ac-ft/yr)	1.482	1.494
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	3.782	3.812
Phosphorus Loading (kg/yr)	0.597	0.602

Catchment Number: 1 Name: BLOCK 110

Project: FL22024
Date: 31/03/2023

Retention Design

Retention Depth (in)	1.100
Retention Volume (ac-ft)	0.207

Watershed Characteristics

Catchment Area (acres)	2.26
Contributing Area (acres)	2.260
Non-DCIA Curve Number	84.73
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	
Provided TN Treatment Efficiency (%)	87
Required TP Treatment Efficiency (%)	
Provided TP Treatment Efficiency (%)	87

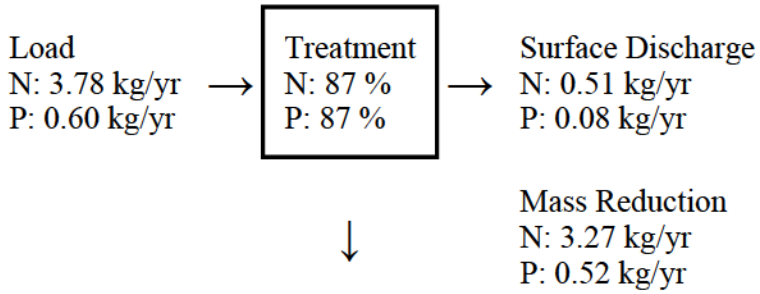
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

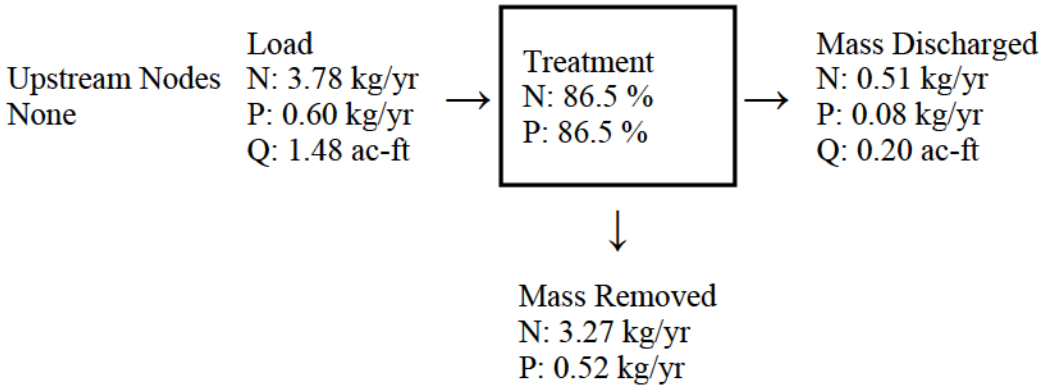
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.471
TN Mass Load (kg/yr)	3.272
TN Concentration (mg/L)	2.070
TP Mass Load (kg/yr)	0.517
TP Concentration (mg/L)	0.327

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Catchment Number: 2 Name: BLOCK 121

Project: FL22024
Date: 31/03/2023

Retention Design

Retention Depth (in)	1.060
Retention Volume (ac-ft)	0.208

Watershed Characteristics

Catchment Area (acres)	2.35
Contributing Area (acres)	2.350
Non-DCIA Curve Number	84.24
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	
Provided TN Treatment Efficiency (%)	86
Required TP Treatment Efficiency (%)	
Provided TP Treatment Efficiency (%)	86

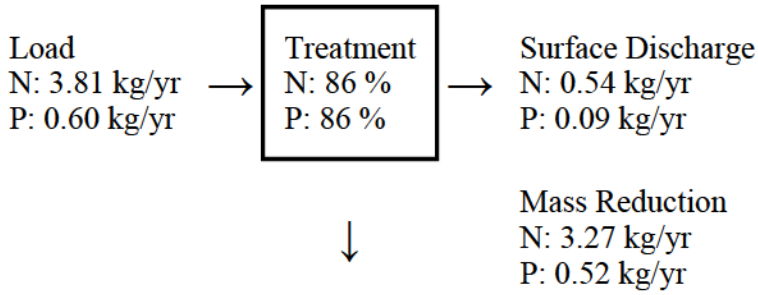
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

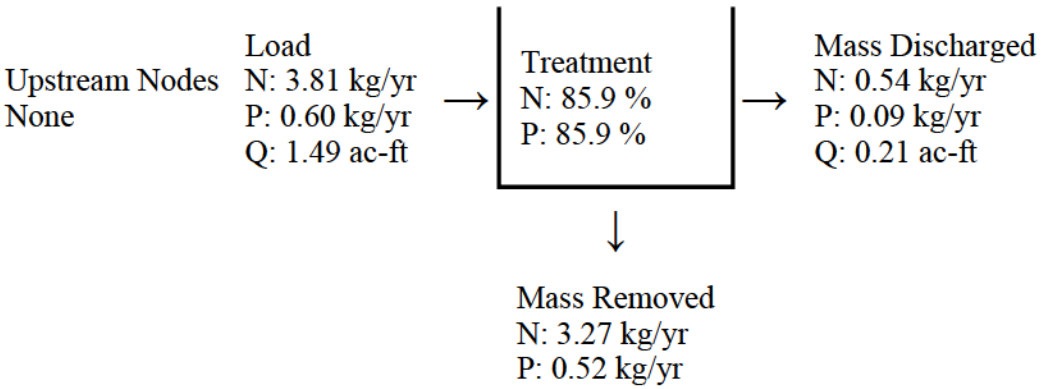
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	3.273
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.517
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: FL22024

Analysis Type: BMP Analysis
BMP Types:
Catchment 1 - (BLOCK 110) Retention
Catchment 2 - (BLOCK 121) Retention
Based on % removal values to the nearest percent

Date:31/03/2023

Routing Summary
Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet

Summary Report

Nitrogen

Surface Water Discharge		
Total N post load	7.59 kg/yr	
Percent N load reduction	86 %	
Provided N discharge load	1.05 kg/yr	2.31 lb/yr
Provided N load removed	6.55 kg/yr	14.43 lb/yr

Phosphorus

Surface Water Discharge		
Total P post load	1.2 kg/yr	
Percent P load reduction	86 %	
Provided P discharge load	.166 kg/yr	.37 lb/yr
Provided P load removed	1.034 kg/yr	2.28 lb/yr

Okeechobee County Water Management Report

Proposed Site Improvements

for

Glenwood Park, LLC

City of Okeechobee, FL

Revised August 2022
Revised January 2023
Revised March 2023

By: Steven L. Dobbs, P.E. # 48134
Steven L. Dobbs Engineering
1062 Jakes Way
Okeechobee, FL 34974

Purpose: The purpose of this report is to provide South Florida Water Management District (SFWMD) and City of Okeechobee County with the calculations and documentation necessary to demonstrate the proposed surface water management system complies with state and local criteria.

Existing Condition Description: The site is an open space lawn with trees and there were no previous improvements on site. There are two portions of the existing site: Block 110 which is the north portion that is enclosed between NE 5th Street, NE 3rd Ave., 4th Street, and NE 2nd Ave. with PARCEL ID: (3-15-37-35-0010-01100-0010). And Block 121 which the south portion enclosed between NE 4th Street, NE 3rd Ave., NE 3rd Street, and NE 2nd Ave. with PARCEL IDs: (3-15-37-35-0010-01210-0060; 3-15-37-35-0010-01210-0040; 3-15-37-35-0010-01210-0030; 3-15-37-35-0010-01210-0010; 3-15-37-35-0010-01210-0070; 3-15-37-35-0010-01210-0090; 3-15-37-35-0010-01210-0100; and 3-15-37-35-0010-01210-0120). Both are in portion of Section 15, Township 37 South, Range 35 East, City of Okeechobee.

The historic discharge for site block 110 is through a sheet flow going to the north and south swale of the and then discharging to an existing drainage structure on the northeast and southeast of the site while some flows are also contained in the site. The historic discharge for site block 121 is through a sheet flow going to the north and east swale of the and then discharging to an existing drainage structure on the northeast of the site while some flows are also contained in the site.

The Soils Report for Okeechobee County identifies the site soil as Immokalee fine sand with 0 to 2% slopes. This soil has a Hydrologic Soil Group rating of B/D which is poorly drained in the natural state and moderately drained in developed. The soils report also indicates the wet season water table is approximately 1′ below natural ground. The average elevation where the north pond is located is 24 which sets the wet season water table elevation to elevation 23, around the south pond the average elevation is 25 which sets the wet season water table elevation to elevation 24.

Proposed Use: The owner proposes construction of 12 duplexes and 4 single family homes for a total of 28 dwelling units with associated parking and covered patio. The project will be served by a dry detention stormwater collection system. The water and sewer will be served by the Okeechobee utility Authority.

Drainage Considerations: To attenuate the increased run-off generated by the proposed improvements and to ensure that water quality standards are met, we propose to pass all drainage areas through a dry detention system which will discharge to the west through north of Fire Station department by drainage pipe to swale. The dry detention basin is a S-133 basin which is controlled at 13.5 NGVD ‘29. The control elevation for the BLOCK 110 will be the wet season water table at elevation 23. This will put the bottom of the pond at elevation 24.00. The control elevation for the BLOCK 121 will be the wet season water table at elevation 24. This will put the bottom of the pond at elevation 25.00.

Allowable discharge for the S-133 basin is 15.6 CSM for the 25 year – 3 day event:

Q = 15.6 cfs per square mile * A / 640

Q1 = 15.6 cfs per square mile * 2.26/ 640 = 0.06 cfs

Q2 = 15.6 cfs per square mile * 2.35/ 640 = 0.06 cfs

A. Water Quality

Water quality treatment is provided in the form of dry detention.

Since the proposed water quality system is dry detention, the volume required is 75% of the calculated volume. However, since this project discharge into an impaired water basin and with a presumption of compliance with nutrient control by adding an additional 50% to the water quality volume the total water quality volume is see

table below.

Based on the attached stage storage spreadsheet, the water quality volume see table below is met at elevation see table below. Total water quality required for 150% of the water quality volume and elevation for the two sites is see table below.

Water Quality Table

Basin	WQ Volume Required Ac-Ft	Elevation WQ Volume Met	WQ Volume Provided Ac-Ft
Onsite Blk 110	0.19	25.15	0.38
Onsite Blk 121	0.20	26.09	0.31

B. Water Quantity

This project is located in the S-133 which discharges ultimately into Lake Okeechobee through S-133 out of the rim canal. The allowable peak discharge rate in this basin is 15.6 CSM. The allowable peak discharge rate for this project, based on the 25-year, 72-hour storm event was calculated and shown below. The actual maximum discharge rate for the 25-year, 72-hour storm event was calculated and shown below, which is within tolerance of the maximum allowable peak rate. To demonstrate conformance to this criterion, the proposed project was flood-routed using WaterCAD.

	Allowable Discharge	Modeled Discharge	Meets Criteria
Onsite Blk 110	0.06 CFS	0.38	No, but minimum bleeder
Onsite Blk 121	0.06 CFS	0.36	No, but minimum bleeder

The 10-year, 24-hour storm (5.0") w/ discharge, the 25 year, 72 hour storm (9") w/ discharge, and the 100 year, 72 hour storm (10") w/o discharge, were evaluated based on the proposed plan. Please refer to the attached WaterCAD flood routing input/output parameters.

A summary of the flood routings for the Lake Node in each Phase is provided as follows:

	10 Year, 24 Hr. Storm (5.0")		25 Year, 72 hr. Storm (9.0")		100 Year, 72 Hr. Storm (10.0")
	Peak Stage (ft-NGVD'29)	Peak Rate (cfs)	Peak Stage (ft-NGVD'29)	Peak Rate (cfs)	Peak Stage (ft- NGVD'29)
Onsite Blk 110	25.31	0.33	25.90	0.38	26.55
Onsite Blk 121	26.21	0.32	26.66	0.36	27.13

Water Use: The proposed potable water and wastewater for the project will be provided by Okeechobee Utility Authority. The wastewater will be by septic tank.

There has been no Consumptive Water Use permit issued nor applied for this project. There are no existing wells onsite.

Off-Site Drainage: There is no offsite flow onto this property.

Flood Plain Analysis: As shown on the attached FEMA Panel 12093C0480C, property are in Zone X (Area of Minimal Flood Hazard) which is at area of minimal flood hazard.

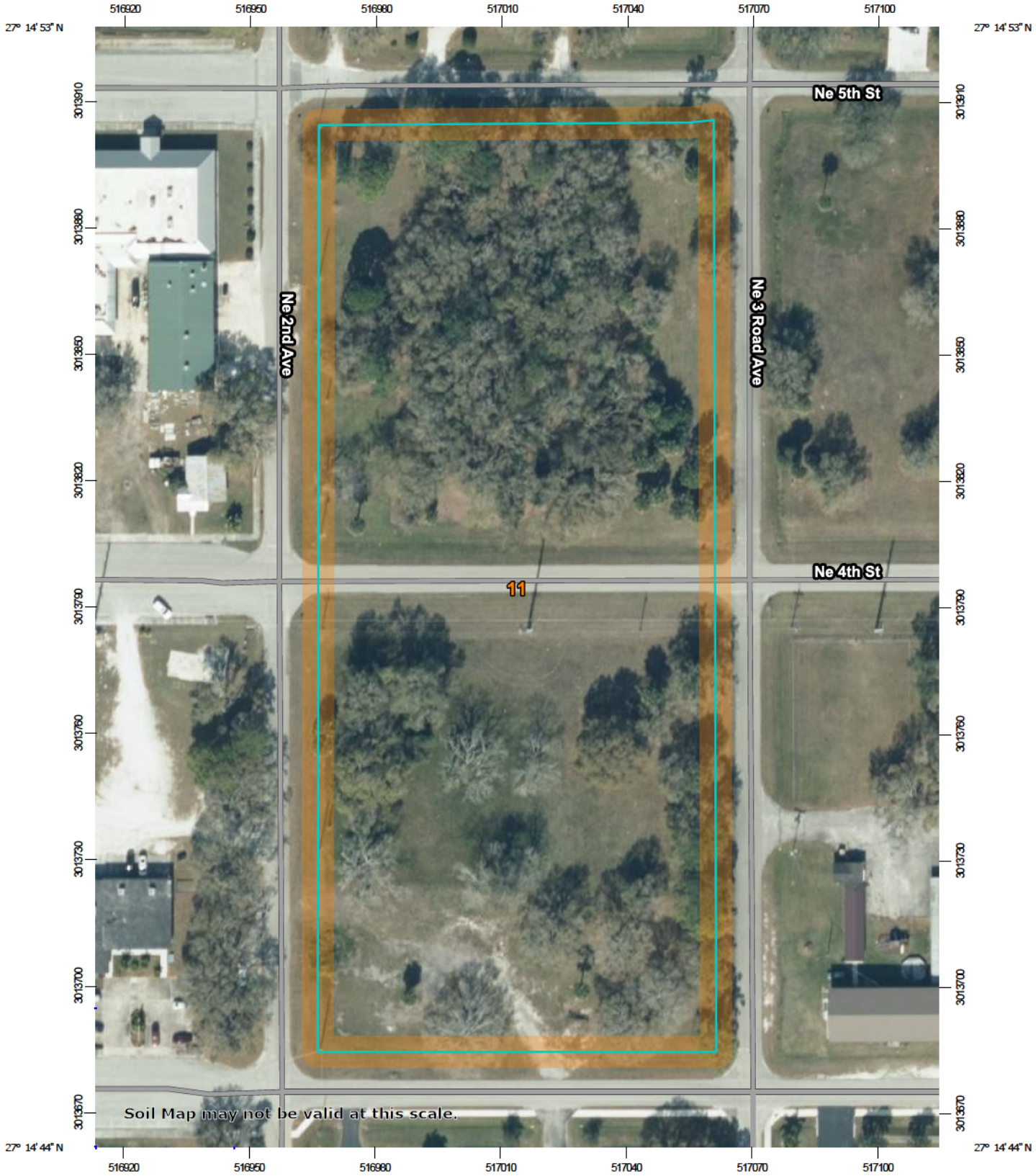
Nutrient Analysis: As previously stated, the project proposes to provide 150% of the required water quality

treatment volume in the dry detention system in order to meet the nutrient removal requirements.

Construction Recommendations: Runoff and/or any water generated by short-term dewatering during construction will be contained on-site. However, there is some potential for transport of sediment to off-site areas should heavy rainfall occur. In order to reduce the potential of any off-site transport of sediment or turbidity we recommend installation and maintenance of temporary silt fence around the perimeter of the proposed project until site work has been completed and the site has been stabilized.

Conclusions: In my professional opinion, the proposed construction should have no impact to existing drainage patterns off-site and should have no impact on off-site areas. The recommendations above should be followed during and after the site work until such time as the ground surface has been adequately stabilized to prevent the off-site transport of any soil or suspended solids. The proposed design and construction will comply with applicable state and local requirements.

Soil Map—Okeechobee County, Florida
(Soil Map)



Map Scale: 1:1,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Okeechobee County, Florida
Survey Area Data: Version 19, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 25, 2019—Jan 29, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
11	Immokalee fine sand, 0 to 2 percent slopes	5.2	100.0%
Totals for Area of Interest		**5.2**	**100.0%**

Hydrologic Soil Group—Okeechobee County, Florida
(Hydrologic Soil Group)

Map Scale: 1:1,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Okeechobee County, Florida
Survey Area Data: Version 19, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 25, 2019—Jan 29, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
11	Immokalee fine sand, 0 to 2 percent slopes	B/D	5.2	100.0%
Totals for Area of Interest			**5.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Depth to Water Table—Okeechobee County, Florida
(Depth of Water Table)

Map Scale: 1:1,300 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points
- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Okeechobee County, Florida
Survey Area Data: Version 19, Aug 26, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 25, 2019—Jan 29, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
11	Immokalee fine sand, 0 to 2 percent slopes	31	5.2	100.0%
Totals for Area of Interest			**5.2**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

National Flood Hazard Layer FIRMette

FEMA

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

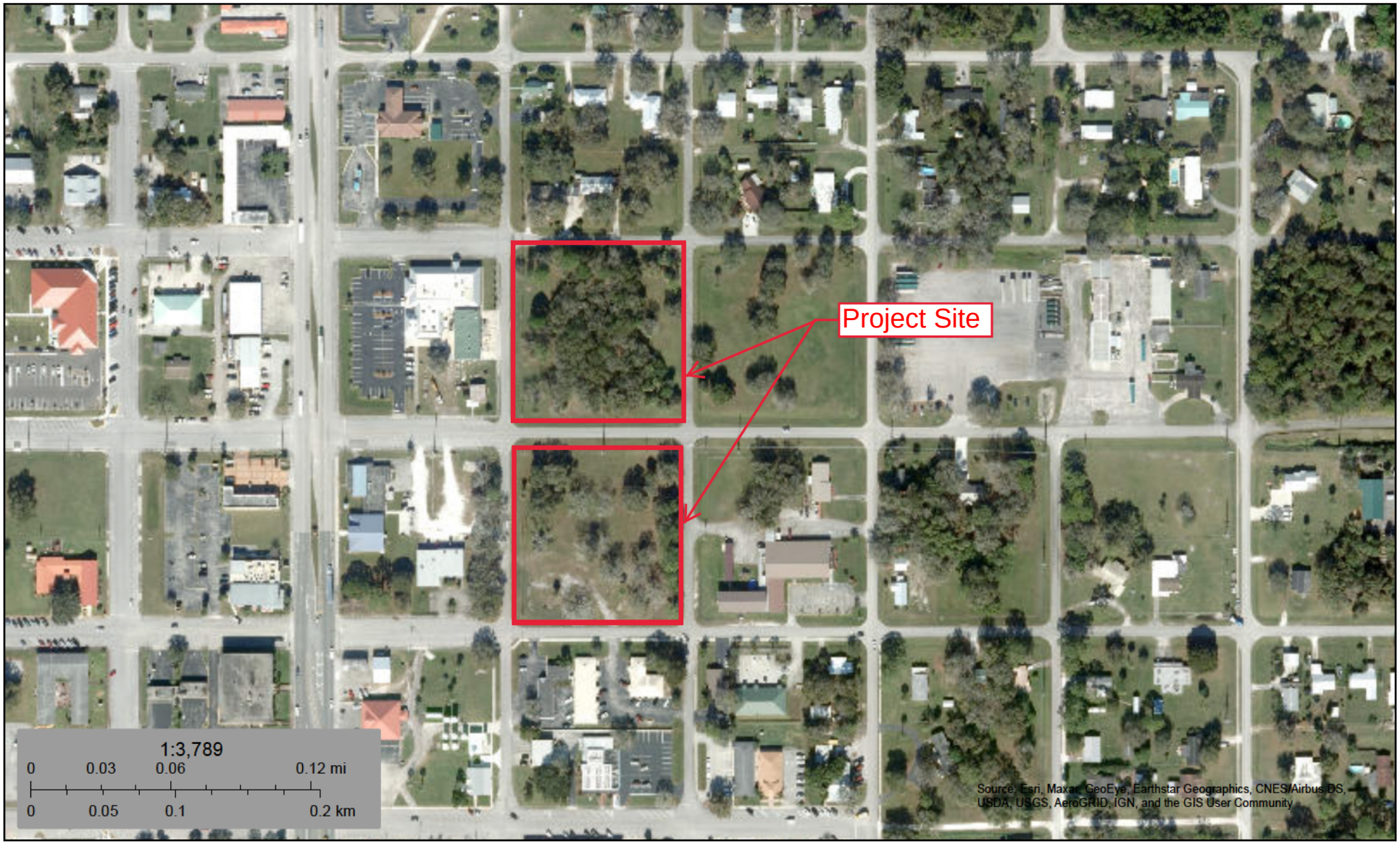
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/4/2022 at 10:28 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetland Mapper



May 4, 2022

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Basin Information For: FL22024-BLOCK 110

Total Basin Area	=	2.26	ac
Total Basin Area (water quality)	=	2.26	ac
Impervious Area			
Roofline/Bldg.	=	0.34	ac
Wetland	=		ac
Lakes	=		ac
Pavement/Sidewalk	=	0.42	ac
Total Impervious Area	=	0.76	ac
Pervious Area			
Dry Detention	=	0.19	ac
Green	=	1.31	ac
Total Pervious Area	=	1.50	ac
Percent Impervious	=	33.6%	
Adjusted Soil Storage	=	1.80	in
Calculated SCS Curve Number	=	73	
Time of Concentration	=	10.00	min

				Stage	
10-year, 1-day	P_{10} =	5.00	in		
V = (((5.00-0.2(1.80))^2)/(5.00-0.8(1.80)))*2.26/12 =		0.63	ac-ft	26.02	ft-NGVD
10-year, 3-day	P_{25} =	9.00	in		
V = (((9.00-0.2(1.80))^2)/(9.00-0.8(1.80)))*2.26/12 =		1.35	ac-ft	26.67	ft-NGVD
100-year, 3-day	P_{100} =	10.00	in		
V = (((10.00-0.2(1.80))^2)/(10.00-0.8(1.80)))*2.26/12		1.53	ac-ft	26.81	ft-NGVD

Control Structure Design

Max. Allowable Discharge	=	0.06	cfs	
Control Elevation	=	23.00	ft-NGVD	
Req. Weir Crest Elevation	=	26.67	ft-NGVD	
Pro. Weir Crest Elevation	=	26.50	ft-NGVD	
Provided Water Quality	=	0.38	ac-ft	
Bleed Down Volume	=	0.19	ac.ft	1/2 detention volume
Allowable Bleeder Discharge	=	0.10	cfs	
	=	0.23	degrees	

Circular Orifice Design:

$Q = 0.6*A*(2*g*H)^{0.5}$

Solving the above equation for Diameter yields

$D = 2*(Q/((0.6*\pi*(2*g*H)^{0.5}))^{0.5}*12$ in/Ft

Assuming 3-inch bleeder initially

$D = 2*[0.10/(0.6*3.414*(2*32.2*(26.50-(23.00+0.125)))^{0.5})]^{0.5}*12$ in/Ft

D	=	1.42	in	for one bleeder

Water Quality Calculation

1/2" Pretreatment x Total Area	=	0.09	ac-ft
1" x Total Area	=	0.19	ac-ft
Runoff from 2.5"x % net Impervious - SFWMD criteria	=	0.10	ac-ft
Required Water Quality Volume	=	0.19	ac-ft
Dry Detention Multiplier	=	1.13	1.5*0.75
Adjusted Required Water Quality Volume	=	0.21	ac-ft
0.5 Water quality stage (0.106116083742252 ac-ft)	=	25.08	ft-NAVD
Water Quality Stage	=	25.33	ft-NAVD
Min. Req Road Crown Elev. (10 yr-24 hr storm)	=	**26.02**	ft-NGVD
Min. Req Perimeter Berm Elev. (25 yr-72 hr storm)	=	**26.67**	ft-NGVD
Min. Req F.F.E. (100 yr-72 hr zero discharge)	=	**26.81**	ft-NGVD

Stage Storage Calculations for Basin FL22024-BLOCK 110

Land use Category	Storage Type	Area (ac.)	From Elev.	To Elev.	Cumulative Stage-Storage (ac-ft)										
					24.00	24.50	25.00	25.50	26.00	26.50	27.00	27.50	28.00	28.50	29.00
Dry retention	Vertical	0.00	24.00	24.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dry retention bank	Linear	0.19	24.00	25.00	0.00	0.02	0.10	0.19	0.29	0.38	0.48	0.57	0.67	0.76	0.86
Building	Vertical	0.34	28.40		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20
Pavement	Linear	0.42	27.00	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.21	0.42	0.63
Green	Linear	1.31	25.00	27.00	0.00	0.00	0.00	0.08	0.33	0.74	1.31	1.97	2.63	3.28	3.94
	Total:	2.26		**Totals:**	**0.00**	**0.024**	**0.10**	**0.27**	**0.61**	**1.12**	**1.79**	**2.59**	**3.50**	**4.50**	**5.63**

Basin Information For: FL22024-BLOCK 121

Total Basin Area	=	2.35	ac
Total Basin Area (water quality)	=	2.35	ac
Impervious Area			
Roofline/Bldg.	=	0.34	ac
Wetland	=		ac
Lakes	=		ac
Pavement/Sidewalk	=	0.42	ac
Total Impervious Area	=	0.76	ac
Pervious Area			
Dry Detention	=	0.21	ac
Green	=	1.39	ac
Total Pervious Area	=	1.59	ac
Percent Impervious	=	32.3%	
Adjusted Soil Storage	=	1.88	in
Calculated SCS Curve Number	=	73	
Time of Concentration	=	10.00	min

				Stage	
10-year, 1-day	P_{10} =	5.00	in		
V = (((5.00-0.2(1.88))^2)/(5.00-0.8(1.88)))*2.35/12 =		0.64	ac-ft	26.71	ft-NGVD
10-year, 3-day	P_{25} =	9.00	in		
V = (((9.00-0.2(1.88))^2)/(9.00-0.8(1.88)))*2.35/12 =		1.39	ac-ft	27.23	ft-NGVD
100-year, 3-day	P_{100} =	10.00	in		
V = (((10.00-0.2(1.88))^2)/(10.00-0.8(1.88)))*2.35/12		1.58	ac-ft	27.34	ft-NGVD

Water Quality Calculation

1/2" Pretreatment x Total Area	=	0.10	ac-ft
1" x Total Area	=	0.20	ac-ft
Runoff from 2.5"x % net Impervious - SFWMD criteria	=	0.10	ac-ft
Required Water Quality Volume	=	0.20	ac-ft
Dry Detention Multiplier	=	1.13	1.5*0.75
Adjusted Required Water Quality Volume	=	0.22	ac-ft
0.5 Water quality stage (0.110325401063189 ac-ft)	=	26.04	ft-NAVD
Water Quality Stage	=	26.21	ft-NAVD
Min. Req Road Crown Elev. (10 yr-24 hr storm)	=	**26.71**	ft-NGVD
Min. Req Perimeter Berm Elev. (25 yr-72 hr storm)	=	**27.23**	ft-NGVD
Min. Req F.F.E. (100 yr-72 hr zero discharge)	=	**27.34**	ft-NGVD

Control Structure Design

Max. Allowable Discharge	=	0.06	cfs	
Control Elevation	=	24.00	ft-NGVD	
Req. Weir Crest Elevation	=	27.23	ft-NGVD	
Pro. Weir Crest Elevation	=	27.00	ft-NGVD	
Provided Water Quality	=	0.31	ac-ft	
Bleed Down Volume	=	0.16	ac.ft	1/2 detention volume
Allowable Bleeder Discharge	=	0.08	cfs	
	=	0.33	degrees	

Circular Orifice Design:

$Q = 0.6*A*(2*g*H)^{0.5}$

Solving the above equation for Diameter yields

$D = 2*(Q/(0.6*\pi*(2*g*H)^{0.5}))^{0.5}*12$ in/Ft

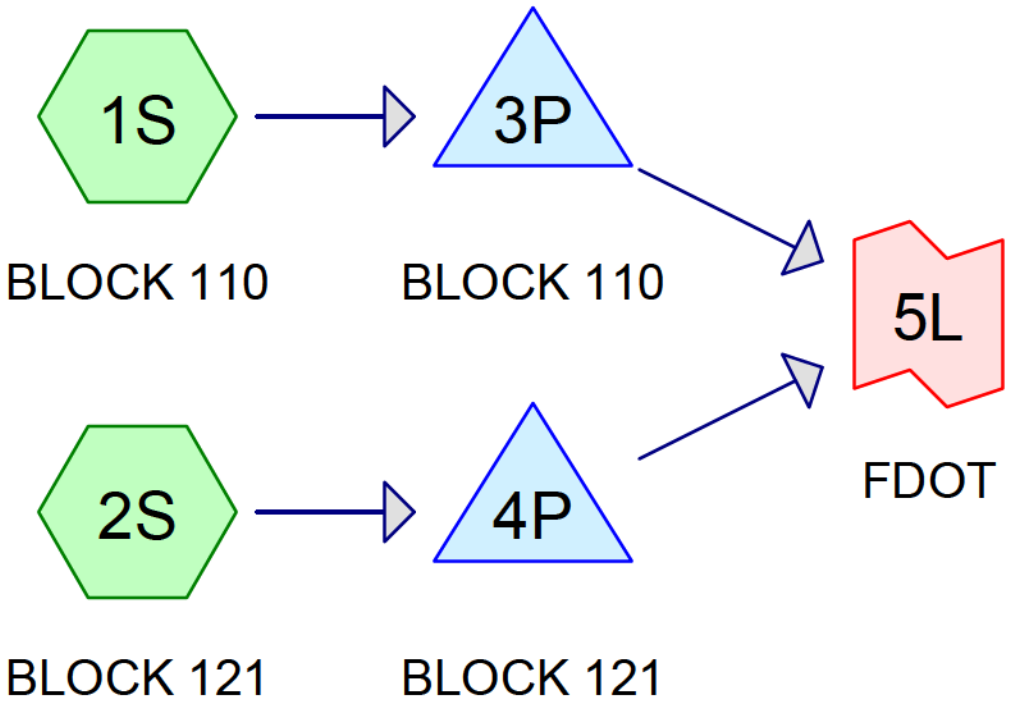
Assuming 3-inch bleeder initially

$D = 2*[0.08/(0.6*3.414*(2*32.2*(27.00-(24.00+0.125)))^{0.5})]^{0.5}*12$ in/Ft

D	=	1.34	in	for one bleeder

Stage Storage Calculations for Basin FL22024-BLOCK 121

Land use Category	Storage Type	Area (ac.)	From Elev.	To Elev.	Cumulative Stage-Storage (ac-ft)										
					25.00	25.50	26.00	26.50	27.00	27.50	28.00	28.50	29.00	29.50	30.00
Dry retention	Vertical	0.00	25.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dry retention bank	Linear	0.21	25.00	26.00	0.00	0.03	0.10	0.21	0.31	0.41	0.52	0.62	0.73	0.83	0.93
Building	Vertical	0.34	28.40		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.20	0.37	0.54
Pavement	Linear	0.42	27.00	28.00	0.00	0.00	0.00	0.00	0.00	0.05	0.21	0.42	0.63	0.84	1.05
Green	Linear	1.39	26.00	27.00	0.00	0.00	0.00	0.17	0.69	1.39	2.08	2.77	3.47	4.16	4.85
	Total:	2.35		**Totals:**	**0.00**	**0.026**	**0.10**	**0.38**	**1.00**	**1.85**	**2.81**	**3.85**	**5.03**	**6.20**	**7.38**



Subcat Reach Pond Link

Routing Diagram for FL22024 POST
Prepared by HP, Printed 29/03/2023

Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: BLOCK 110 Runoff Area=2.260 ac 33.63% Impervious Runoff Depth=2.28"
Tc=10.0 min CN=73 Runoff=2.77 cfs 0.429 af

Subcatchment 2S: BLOCK 121 Runoff Area=2.350 ac 32.34% Impervious Runoff Depth=2.28"
Tc=10.0 min CN=73 Runoff=2.88 cfs 0.447 af

Pond 3P: BLOCK 110 Peak Elev=25.31' Storage=0.206 af Inflow=2.77 cfs 0.429 af
Outflow=0.33 cfs 0.429 af

Pond 4P: BLOCK 121 Peak Elev=26.21' Storage=0.219 af Inflow=2.88 cfs 0.447 af
Outflow=0.32 cfs 0.447 af

Link 5L: FDOT Inflow=0.66 cfs 0.876 af
Primary=0.66 cfs 0.876 af

Total Runoff Area = 4.610 ac Runoff Volume = 0.876 af Average Runoff Depth = 2.28"
67.03% Pervious = 3.090 ac 32.97% Impervious = 1.520 ac

Summary for Subcatchment 1S: BLOCK 110

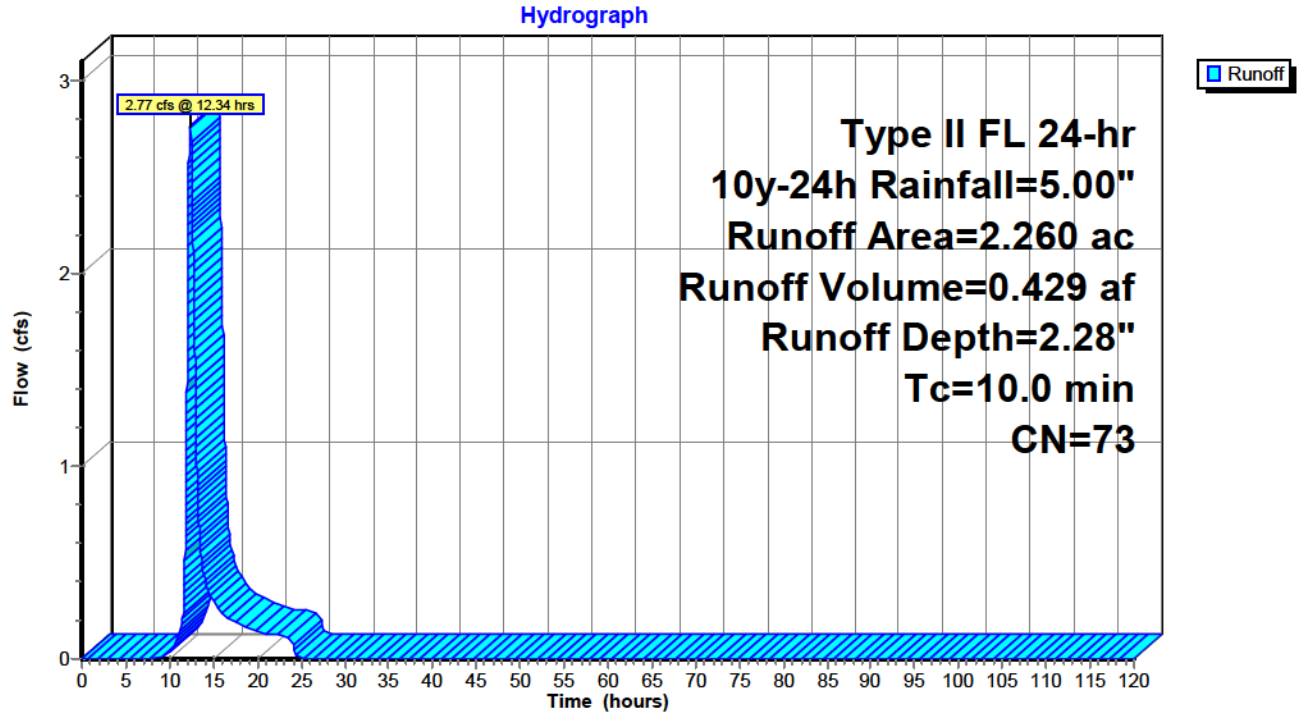
Runoff = 2.77 cfs @ 12.34 hrs, Volume= 0.429 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type II FL 24-hr 10y-24h Rainfall=5.00"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG A
1.500	61	>75% Grass cover, Good, HSG B
2.260	73	Weighted Average
1.500	61	66.37% Pervious Area
0.760	98	33.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: BLOCK 110



Summary for Subcatchment 2S: BLOCK 121

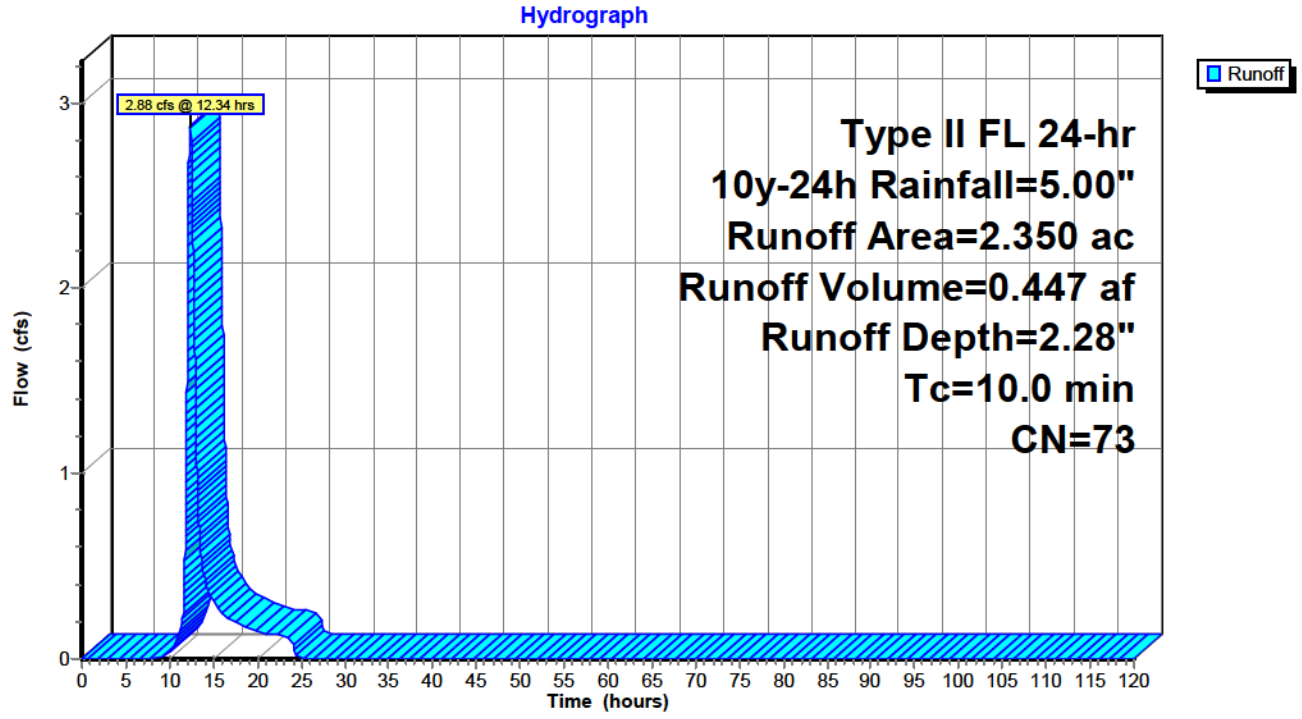
Runoff = 2.88 cfs @ 12.34 hrs, Volume= 0.447 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type II FL 24-hr 10y-24h Rainfall=5.00"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG A
1.590	61	>75% Grass cover, Good, HSG B
2.350	73	Weighted Average
1.590	61	67.66% Pervious Area
0.760	98	32.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 2S: BLOCK 121



Summary for Pond 3P: BLOCK 110

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 2.260 ac, 33.63% Impervious, Inflow Depth = 2.28" for 10y-24h event
Inflow = 2.77 cfs @ 12.34 hrs, Volume= 0.429 af
Outflow = 0.33 cfs @ 14.60 hrs, Volume= 0.429 af, Atten= 88%, Lag= 135.5 min
Primary = 0.33 cfs @ 14.60 hrs, Volume= 0.429 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 25.31' @ 14.60 hrs Surf.Area= 0.000 ac Storage= 0.206 af

Plug-Flow detention time= 291.7 min calculated for 0.429 af (100% of inflow)
Center-of-Mass det. time= 291.7 min (1,160.2 - 868.6)

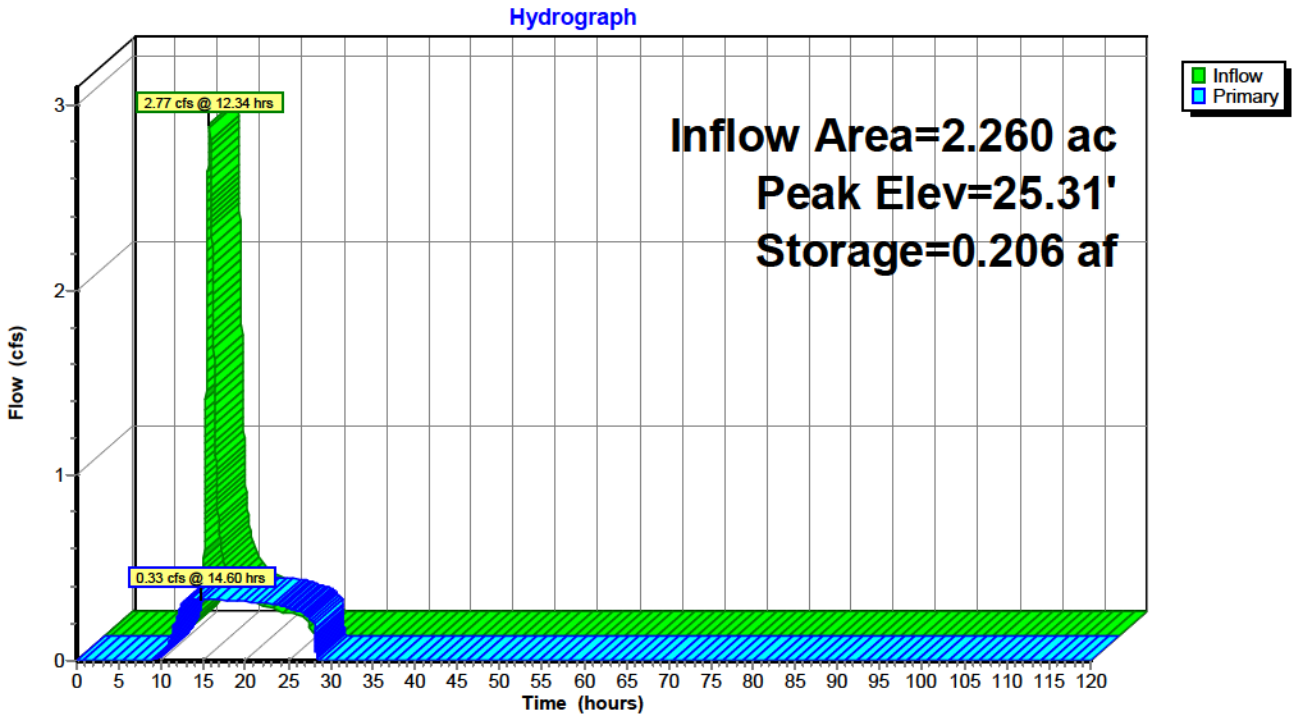
Volume	Invert	Avail.Storage	Storage Description
#1	24.00'	3.500 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
24.00	0.000
24.50	0.024
25.00	0.100
25.50	0.270
26.00	0.610
26.50	1.120
27.00	1.790
27.50	2.590
28.00	3.500

Device	Routing	Invert	Outlet Devices
#1	Primary	23.33'	**18.0" Round Culvert** L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 23.33' / 23.30' S= 0.0009 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	23.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	26.50'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.33 cfs @ 14.60 hrs HW=25.31' (Free Discharge)
└**1=Culvert** (Passes 0.33 cfs of 5.49 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.33 cfs @ 6.78 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: BLOCK 110



Summary for Pond 4P: BLOCK 121

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 2.350 ac, 32.34% Impervious, Inflow Depth = 2.28" for 10y-24h event
Inflow = 2.88 cfs @ 12.34 hrs, Volume= 0.447 af
Outflow = 0.32 cfs @ 14.81 hrs, Volume= 0.447 af, Atten= 89%, Lag= 148.4 min
Primary = 0.32 cfs @ 14.81 hrs, Volume= 0.447 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 26.21' @ 14.81 hrs Surf.Area= 0.000 ac Storage= 0.219 af

Plug-Flow detention time= 316.9 min calculated for 0.447 af (100% of inflow)
Center-of-Mass det. time= 316.9 min (1,185.5 - 868.6)

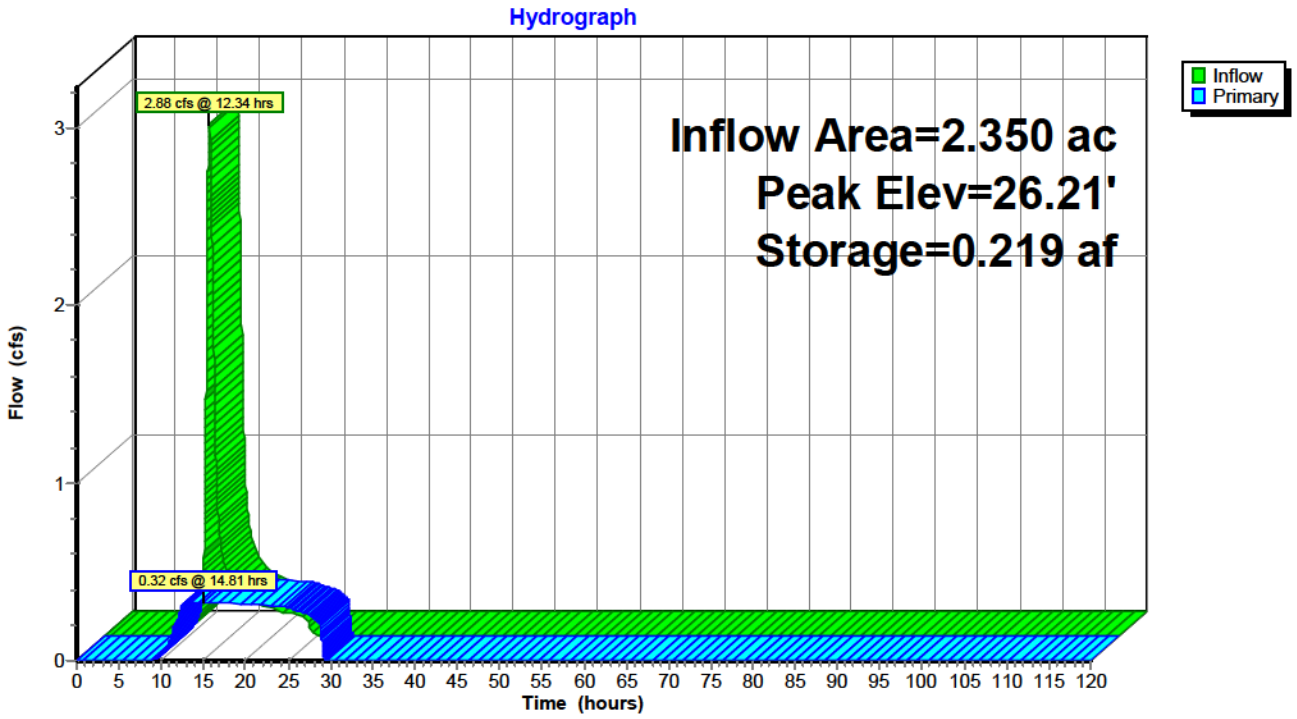
Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	5.030 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
25.00	0.000
25.50	0.026
26.00	0.100
26.50	0.380
27.00	1.000
27.50	1.850
28.00	2.810
28.50	3.850
29.00	5.030

Device	Routing	Invert	Outlet Devices
#1	Primary	24.33'	**18.0" Round Culvert** L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 24.33' / 24.30' S= 0.0010 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	24.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	27.00'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.32 cfs @ 14.81 hrs HW=26.21' (Free Discharge)
└**1=Culvert** (Passes 0.32 cfs of 5.55 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 6.61 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: BLOCK 121

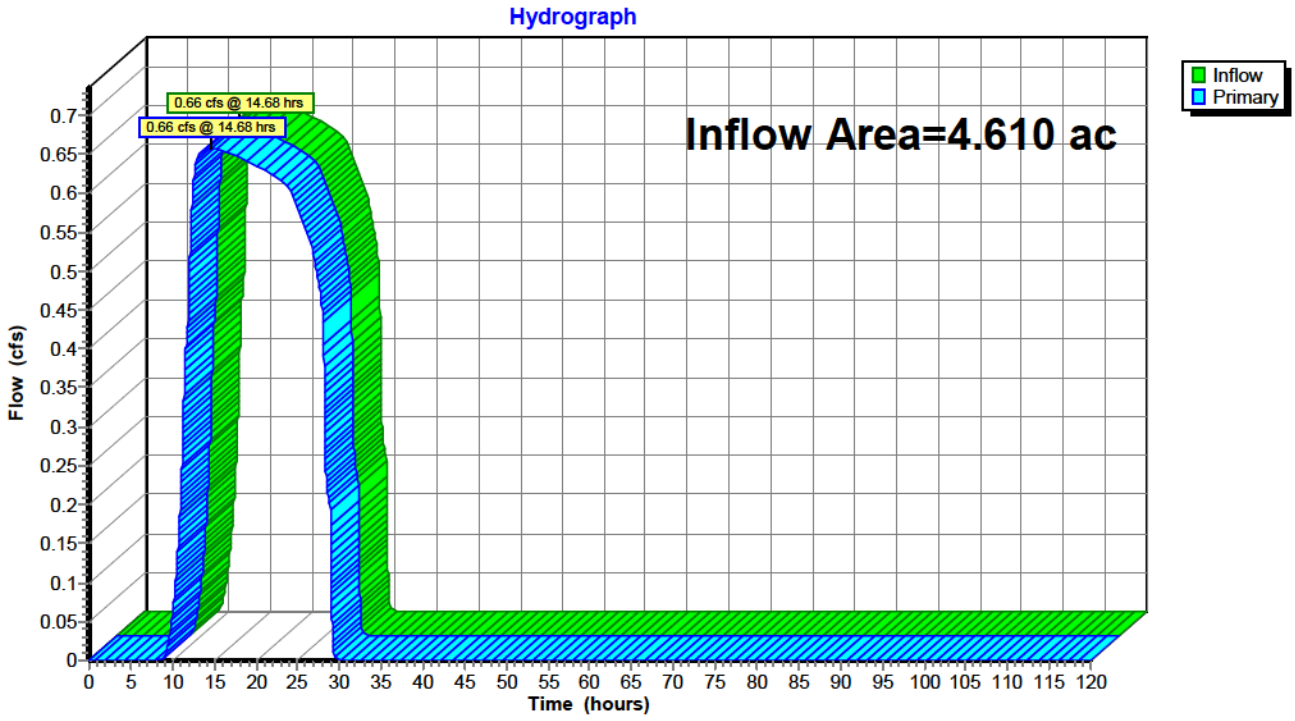


Summary for Link 5L: FDOT

Inflow Area = 4.610 ac, 32.97% Impervious, Inflow Depth = 2.28" for 10y-24h event
Inflow = 0.66 cfs @ 14.68 hrs, Volume= 0.876 af
Primary = 0.66 cfs @ 14.68 hrs, Volume= 0.876 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Link 5L: FDOT



Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: BLOCK 110 Runoff Area=2.260 ac 33.63% Impervious Runoff Depth=5.71"
Tc=10.0 min CN=73 Runoff=7.78 cfs 1.075 af

Subcatchment 2S: BLOCK 121 Runoff Area=2.350 ac 32.34% Impervious Runoff Depth=5.71"
Tc=10.0 min CN=73 Runoff=8.09 cfs 1.117 af

Pond 3P: BLOCK 110 Peak Elev=25.90' Storage=0.542 af Inflow=7.78 cfs 1.075 af
Outflow=0.38 cfs 1.075 af

Pond 4P: BLOCK 121 Peak Elev=26.66' Storage=0.578 af Inflow=8.09 cfs 1.117 af
Outflow=0.36 cfs 1.117 af

Link 5L: FDOT Inflow=0.74 cfs 2.192 af
Primary=0.74 cfs 2.192 af

Total Runoff Area = 4.610 ac Runoff Volume = 2.192 af Average Runoff Depth = 5.71"
67.03% Pervious = 3.090 ac 32.97% Impervious = 1.520 ac

Summary for Subcatchment 1S: BLOCK 110

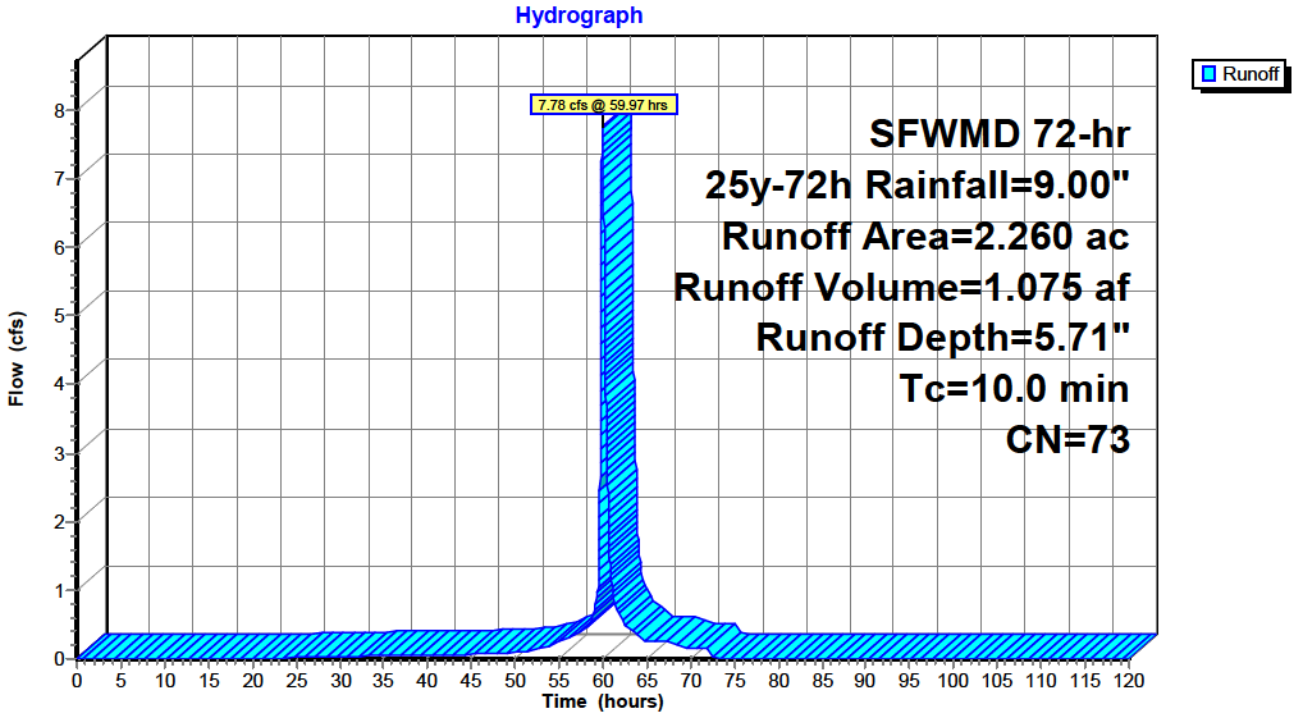
Runoff = 7.78 cfs @ 59.97 hrs, Volume= 1.075 af, Depth= 5.71"

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 25y-72h Rainfall=9.00"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG A
1.500	61	>75% Grass cover, Good, HSG B
2.260	73	Weighted Average
1.500	61	66.37% Pervious Area
0.760	98	33.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 1S: BLOCK 110



Summary for Subcatchment 2S: BLOCK 121

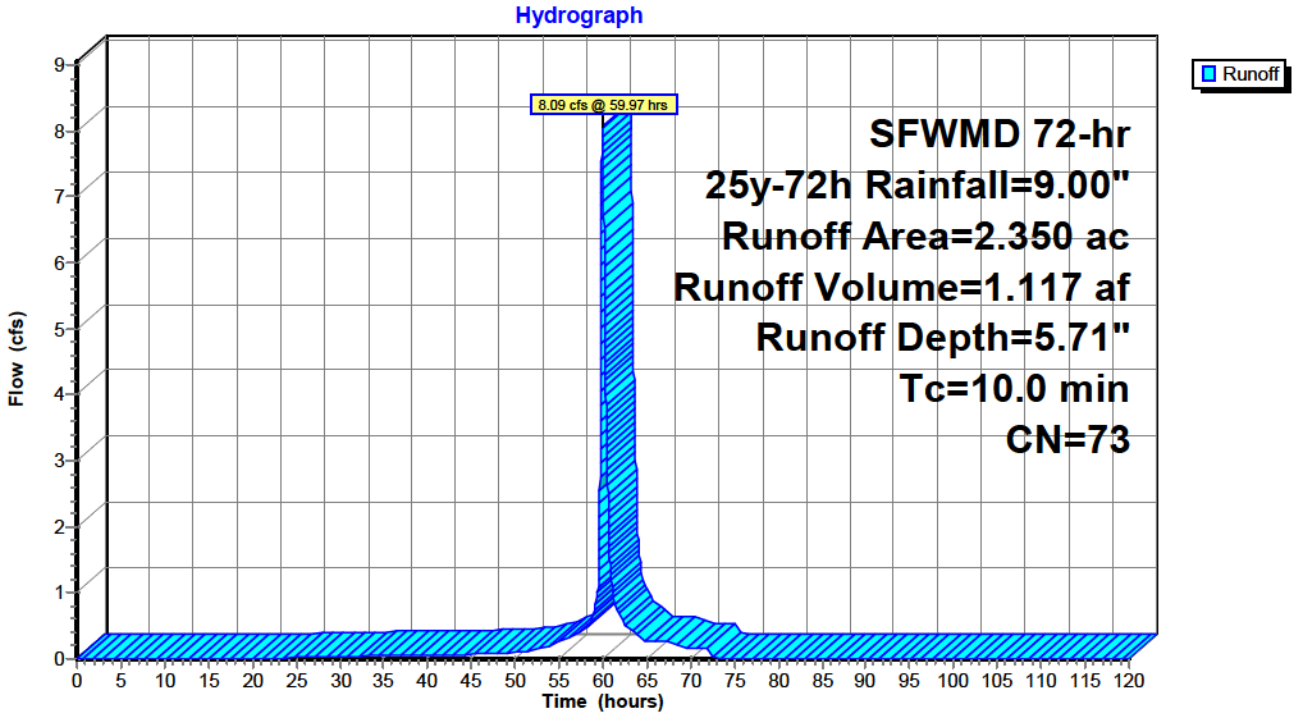
Runoff = 8.09 cfs @ 59.97 hrs, Volume= 1.117 af, Depth= 5.71"

Runoff by SCS TR-20 method, UH=SWFWMD-256, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
SFWMD 72-hr 25y-72h Rainfall=9.00"

Area (ac)	CN	Description
0.760	98	Paved parking, HSG A
1.590	61	>75% Grass cover, Good, HSG B
2.350	73	Weighted Average
1.590	61	67.66% Pervious Area
0.760	98	32.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 2S: BLOCK 121



Summary for Pond 3P: BLOCK 110

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 2.260 ac, 33.63% Impervious, Inflow Depth = 5.71" for 25y-72h event
Inflow = 7.78 cfs @ 59.97 hrs, Volume= 1.075 af
Outflow = 0.38 cfs @ 63.72 hrs, Volume= 1.075 af, Atten= 95%, Lag= 225.0 min
Primary = 0.38 cfs @ 63.72 hrs, Volume= 1.075 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 25.90' @ 63.72 hrs Surf.Area= 0.000 ac Storage= 0.542 af

Plug-Flow detention time= 531.7 min calculated for 1.075 af (100% of inflow)
Center-of-Mass det. time= 531.8 min (4,047.5 - 3,515.7)

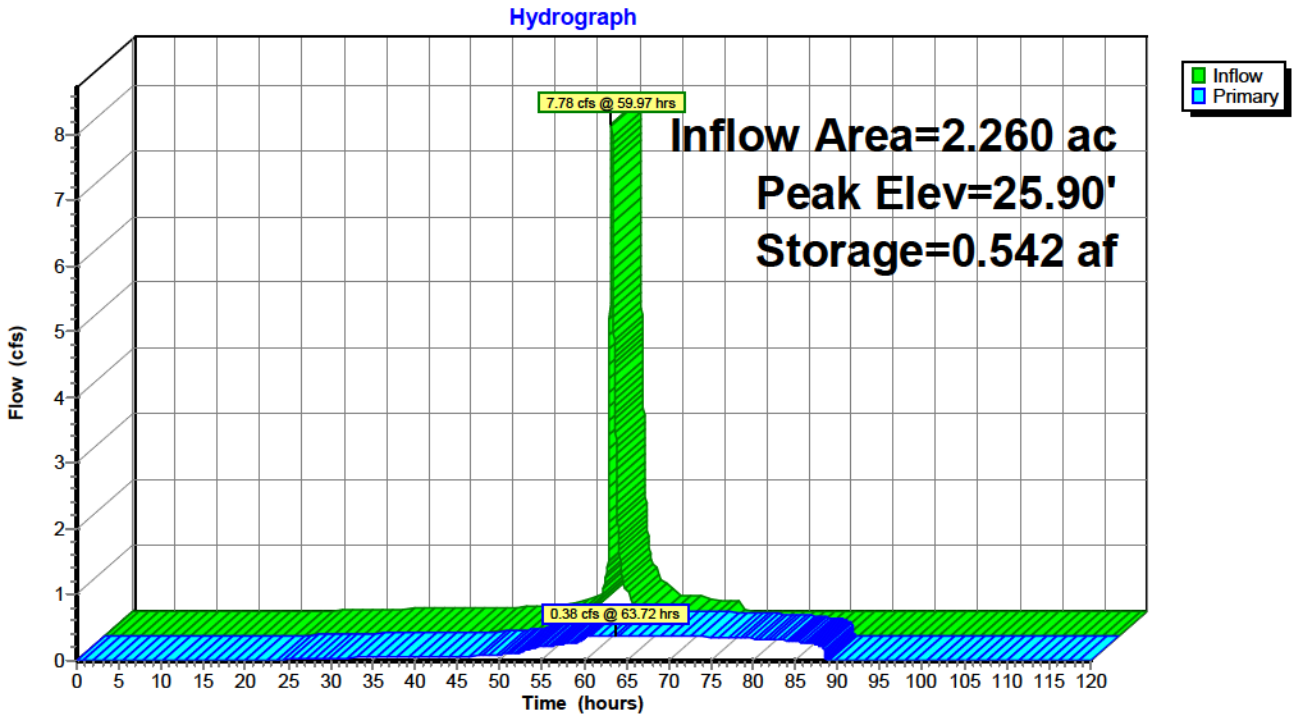
Volume	Invert	Avail.Storage	Storage Description
#1	24.00'	3.500 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
24.00	0.000
24.50	0.024
25.00	0.100
25.50	0.270
26.00	0.610
26.50	1.120
27.00	1.790
27.50	2.590
28.00	3.500

Device	Routing	Invert	Outlet Devices
#1	Primary	23.33'	**18.0" Round Culvert** L= 32.0' Ke= 0.500 Inlet / Outlet Invert= 23.33' / 23.30' S= 0.0009 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	23.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	26.50'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.38 cfs @ 63.72 hrs HW=25.90' (Free Discharge)
└**1=Culvert** (Passes 0.38 cfs of 7.77 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.38 cfs @ 7.72 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: BLOCK 110



Summary for Pond 4P: BLOCK 121

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 2.350 ac, 32.34% Impervious, Inflow Depth = 5.71" for 25y-72h event
Inflow = 8.09 cfs @ 59.97 hrs, Volume= 1.117 af
Outflow = 0.36 cfs @ 64.05 hrs, Volume= 1.117 af, Atten= 96%, Lag= 245.3 min
Primary = 0.36 cfs @ 64.05 hrs, Volume= 1.117 af

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 26.66' @ 64.05 hrs Surf.Area= 0.000 ac Storage= 0.578 af

Plug-Flow detention time= 588.5 min calculated for 1.117 af (100% of inflow)
Center-of-Mass det. time= 588.5 min (4,104.2 - 3,515.7)

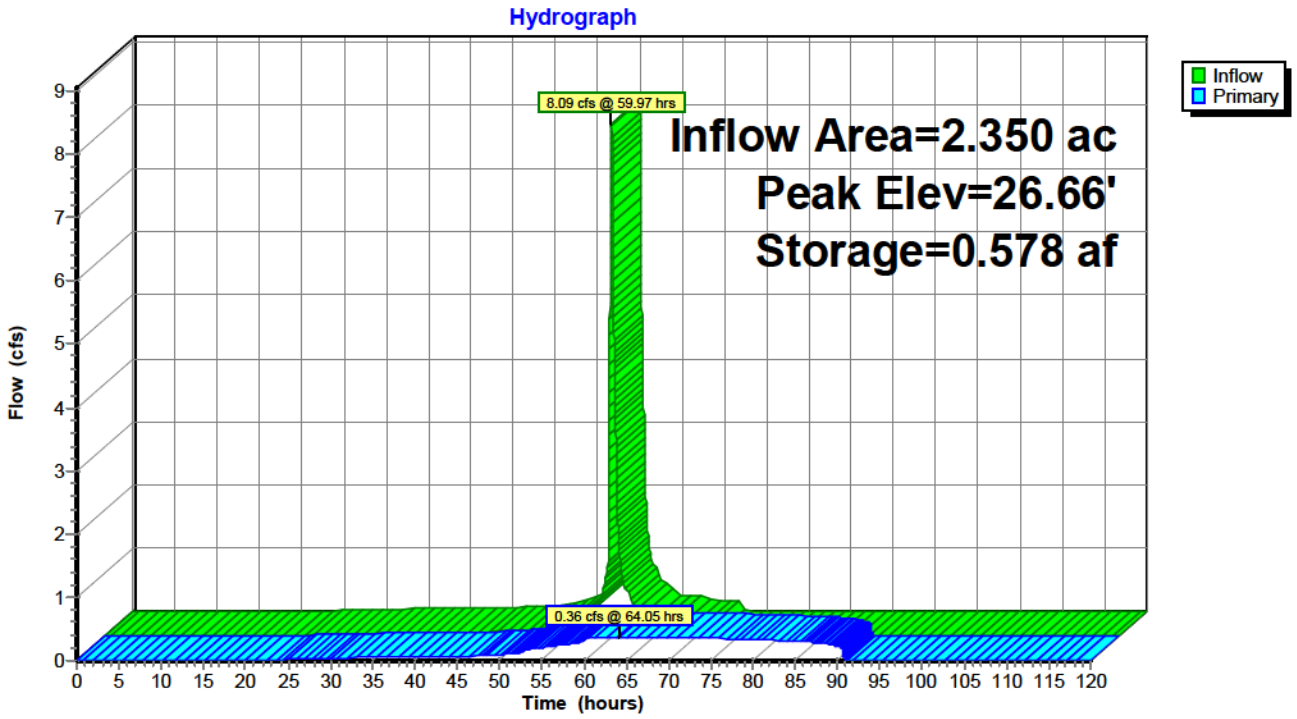
Volume	Invert	Avail.Storage	Storage Description
#1	25.00'	5.030 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
25.00	0.000
25.50	0.026
26.00	0.100
26.50	0.380
27.00	1.000
27.50	1.850
28.00	2.810
28.50	3.850
29.00	5.030

Device	Routing	Invert	Outlet Devices
#1	Primary	24.33'	**18.0" Round Culvert** L= 29.0' Ke= 0.500 Inlet / Outlet Invert= 24.33' / 24.30' S= 0.0010 '/' Cc= 0.900 n= 0.025, Flow Area= 1.77 sf
#2	Device 1	24.00'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	27.00'	**24.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.36 cfs @ 64.05 hrs HW=26.66' (Free Discharge)
└**1=Culvert** (Passes 0.36 cfs of 7.07 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.36 cfs @ 7.35 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: BLOCK 121

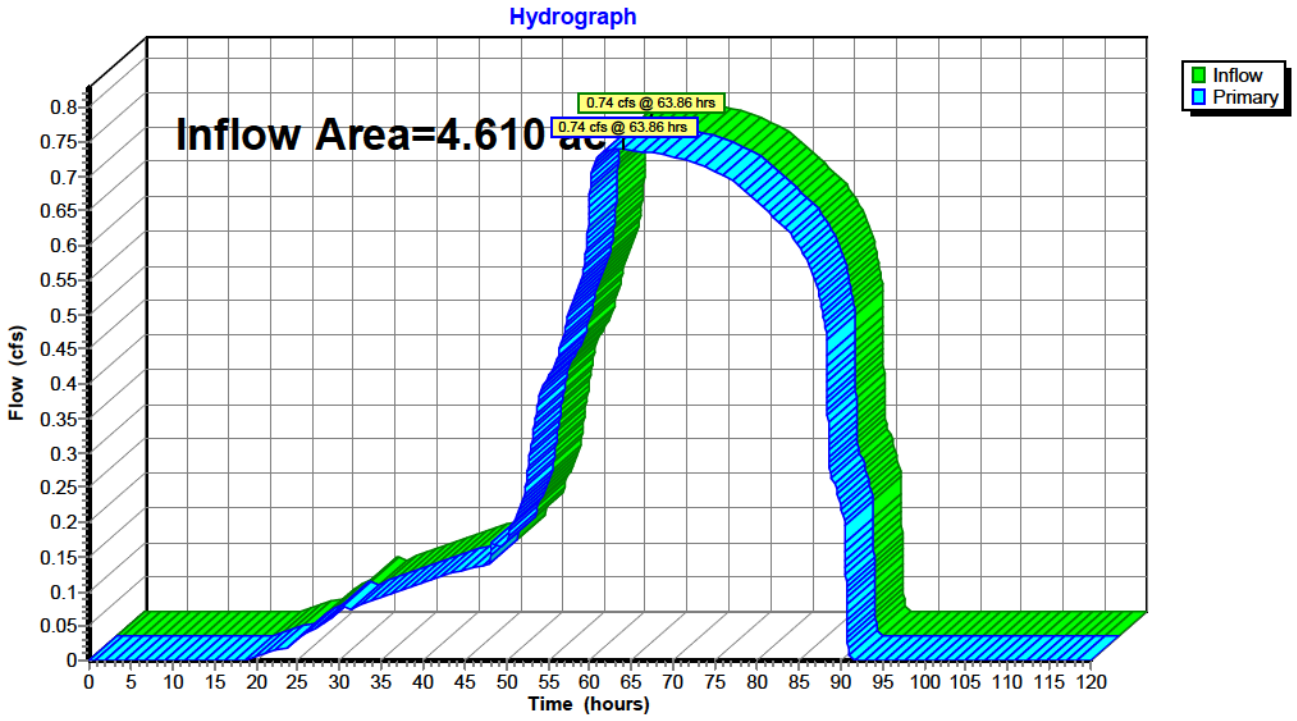


Summary for Link 5L: FDOT

Inflow Area = 4.610 ac, 32.97% Impervious, Inflow Depth = 5.71" for 25y-72h event
Inflow = 0.74 cfs @ 63.86 hrs, Volume= 2.192 af
Primary = 0.74 cfs @ 63.86 hrs, Volume= 2.192 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Link 5L: FDOT



Summary for Pond 13P: BLOCK 110 - 100Y-72H

Inflow Area = 2.260 ac, 33.63% Impervious, Inflow Depth = 5.71" for 25y-72h event
Inflow = 7.78 cfs @ 59.97 hrs, Volume= 1.075 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 26.39' @ 73.01 hrs Surf.Area= 0.000 ac Storage= 1.075 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	23.33'	3.570 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
23.33	0.000
23.50	0.002
24.00	0.030
24.50	0.080
25.00	0.160
25.50	0.340
26.00	0.680
26.50	1.180
27.00	1.850
27.50	2.660
28.00	3.570

Summary for Pond 14P: BLOCK 121 - 100Y-72H

Inflow Area = 2.350 ac, 32.34% Impervious, Inflow Depth = 5.71" for 25y-72h event
Inflow = 8.09 cfs @ 59.97 hrs, Volume= 1.117 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 27.03' @ 73.01 hrs Surf.Area= 0.000 ac Storage= 1.117 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	24.33'	5.100 af	**Custom Stage Data** Listed below

Elevation (feet)	Cum.Store (acre-feet)
24.33	0.000
24.50	0.002
25.00	0.030
25.50	0.080
26.00	0.170
26.50	0.450
27.00	1.070
27.50	1.920
28.00	2.880
28.50	3.920
29.00	5.100