

CITY OF DOVER

DOVER CONSERVATION COMMISSION – AGENDA

Meeting Type: Regular Meeting
Meeting Location: City Council Conference Room - 288 Central Avenue Dover NH
Meeting Date: Monday, April 14, 2025
Meeting Time: 5:30 pm

1. CALL TO ORDER AND ROLL CALL

2. CITIZEN’S FORUM

3. APPROVAL OF THE PRIOR MEETING MINUTES – March 10, 2025

4. OLD BUSINESS

5. NEW BUSINESS

- A. City of Dover Conditional Use Permit for 210 Tolend, LLC, Assessor’s Map F, Lot 3, zoned R-40, located at 210 Tolend Road. Proposal seeks to allow 25% impervious surface coverage within the Secondary Groundwater Protection District, where up to 20% is allowed. The application is part of an Open Space Subdivision proposal that includes 29 housing units.

6. REPORT FROM THE CHAIR

- A. Review of Correspondence Received from NH Department of Environmental Services

7. OTHER BUSINESS

- A. Update from Forest Management Subcommittee
- B. Member Update

8. ADJOURNMENT



CITY OF DOVER

DOVER CONSERVATION COMMISSION – MINUTES

Meeting Type: Regular Meeting
Meeting Location: City Council Conference Room - 288 Central Avenue, Dover, NH
Meeting Date: Monday March 10, 2025
Meeting Time: 5:30 pm

MEMBERS PRESENT: Bill Hunt (Chair), Abigail Lyon, Russ Warnock (Alternate), Kristen Murphy, Brianna Group

Absent (Excused): Robert Atwood (Secretary) Steve Fellows (Vice Chair)

Absent (Unexcused): Jake Geddes

STAFF PRESENT: Makayla Edgecomb (Conservation Planner) Donna Benton (Planning Director) Chris Parker (Deputy City Manager)

OTHERS PRESENT:

1. CALL TO ORDER AND ROLL CALL

The meeting was convened at 5:30 PM.

2. CITIZENS' FORUM

None

3. APPROVAL OF THE PRIOR MEETING MINUTES- FEBRUARY 10, 2025

K. Murphy moved to approve the minutes of February 10th as submitted. A. Lyon seconded. Vote: U/A

4. OLD BUSINESS:

None

5. NEW BUSINESS

- A.** City of Dover Conditional Use Permit for DBS Holdings, LLC, Assessor's Map B, Lot 2, zoned R-40, located at 512 Sixth Street. Proposal is to construct an infiltration basin, stormwater conveyance, and grading improvements to support the development of five (5) single-family dwellings resulting in approx. 2,926 s.f. of wetland buffer impacts, there are no direct wetland impacts. *(Three (3) units previously approved by Planning Board through TDR: TRAN-2024-0006)*

Joe Griffin presented the item on behalf of DBS Holdings LLC. He described the lot as exists and the proposal to demolish all existing structures and add five single-family dwellings. He described the utilities, driveway, stormwater and impact details.

He answered questions from the committee members with additional details about the project. Staff answered some questions about HOA maintenance enforcement.

A. Lyon moved to endorse the CUP as presented. Motion was seconded. Vote: All in favor with 0 opposed.

6. REPORT FROM THE CHAIR

- a. Review of Correspondence Received from NH Department of Environmental Services**

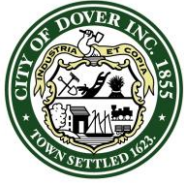
None

7. OTHER BUSINESS

A. Update from Forest Management Subcommittee

- RFP criteria for landscape architecture plan for ash trees for CBD
- Students from Great Bay Community College attended latest meeting

B. Purchase of Parcel, and Proposed Conservation Land



CITY OF DOVER

DOVER CONSERVATION COMMISSION – MINUTES

Meeting Type: Regular Meeting
Meeting Location: City Council Conference Room - 288 Central Avenue, Dover, NH
Meeting Date: Monday March 10, 2025
Meeting Time: 5:30 pm

C. Parker presented this item and explained the details and reason for request for purchase of land with Conservation Commission endorsement. Conservation Funds will not be used.

It was moved and seconded to endorse the purchase of the described parcel for future conservation land. Vote: U/A

C. Conservation Fund Request for Staff Administration Costs

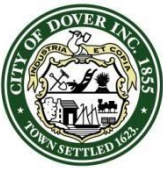
D. Benton explained the request for additional funds required to supplement the request made and approved at the last meeting for staff administration costs.

A. Lyon moved to endorse the fund request of \$120,000, replacing the previously endorsed \$110,000 for the budget year. Seconded by: R. Warnock. Vote: All in favor with 0 opposed.

8. ADJOURNMENT

It was moved and seconded to adjourn. Vote: U/A

The meeting was adjourned at 6:00 PM.



City of Dover, New Hampshire CONDITIONAL USE PERMIT APPLICATION

[Revision Date: October 19, 2020]

Office Use Only	Project #:	_____	Date Received:	_____
	Amount Paid:	_____	Time Received:	_____

APPLICANT AND OWNER INFORMATION

Name of Applicant: _____ 210 Tolend Road, LLC Telephone # _____ 978-375-3153

Address of Applicant: _____ 42J Dover Point Road

E-Mail Address: _____ johnoneill.nh@gmail.com

Name of Property Owner (if different from applicant): _____ Telephone # _____

Address of Property Owner: _____

PROPERTY INFORMATION

Assessor's Map # _____ F Lot(s) # _____ 3

Address of Property: _____ 210 Tolend Road and Emerald Lane

Zoning District(s) _____ R-40 Overlay District(s) _____ Wetland, secondary groundwater protection

Existing Use of Property: _____ Single family residential

CONDITIONAL USE PERMIT INFORMATION

Type of Conditional Use Permit (Check All That Apply):

- | | | |
|--|---|--|
| ☐ Conservation District | ☐ RCM Use Overlay District | ☐ Gateway District |
| ☒ Groundwater Protection | ☐ Off-Street Parking and Loading | ☐ Alternative Treatment Center |
| ☐ Wetland Protection District | ☐ Central Business District | ☐ Heritage Residential District |

Describe Proposed Use or Activity That Requires Conditional Use Permit and Describe Any Impacts:

The construction of greater than 20% impervious cover within the secondary groundwater protection district.

We have calculated the proposed impervious cover within the secondary groundwater protection district

to be 25% where 20% is permitted without a Conditional Use Permit.

List Any Associated State or Federal Permits That Have Been or Will Be Applied For and Indicate Their Status: Alteration of Terrain (pending), Sewer Discharge Permit (pending) and EPA Notice of Intent (pending).

Name of Professional That Prepared Plans: Robert J. Stowell, Trittech Engineering Corp.

Address 755 Central Ave, Dover, NH Telephone #: 603-742-8107

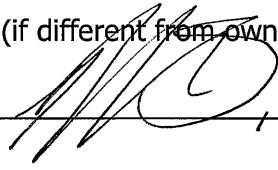
Professional License #: PE #9903 LLS #884 E-mail address: rjs@tritecheng.com

SIGNATURES

I/We hereby submit this application to the City of Dover Planning Board and attest that to the best of my knowledge all of the information on this application form and in the accompanying application materials and documentation is true and accurate. As applicant or as agent, I attest that I am duly authorized to act in this capacity.

Signature of Property Owner: _____ Date: _____

Signature of Applicant (if different from owner): _____ Date: _____

Signature of Agent:  PRESIDENT Date: 04/04/25

AUTHORIZATION TO ENTER SUBJECT PROPERTY

I, and my successors, hereby authorize members of the Dover Planning Board, Planning Department and other pertinent City Departments and boards to enter my property for the purpose of evaluating this application, including performing inspections during the application phase, post-approval phase, construction phase and occupancy phase. It is understood that these individuals must use all reasonable care, courtesy, and diligence when on the property.

Signature of Property Owner: _____ Date: _____

**CITY OF DOVER CONDITIONAL USE
LIST OF ABUTTERS**

Pursuant to RSA 676:4, the State Law of New Hampshire, the City of Dover is required to notify the applicant, abutters (including holders of conservation easements), and any professional whose seal is on the plan, of the public hearing by certified mail, return receipt requested. Staff will provide the abutter information, while the applicant must provide accurate contact information for the owner, applicant and professional agents representing the project.

Owner:

TAX MAP	LOT #	PROPERTY OWNER	<u>MAILING ADDRESS</u>
F	3	210 Tolend, LLC	42J Dover Point Road, Dover NH

Applicant (if different from owner):

APPLICANT NAME	APPLICANT COMPANY	<u>MAILING ADDRESS</u>

Surveyor and/or Engineer/Professional Agent:

NAME	COMPANY	<u>MAILING ADDRESS</u>
Robert J. Stowell	Tritech Engineering Corporation	755 Central Ave, Dover, NH
Michael Mariano	Highland Soil Services	75 Prospect Street, Somersworth, NH

Conservation Easement Holder:

TAX MAP	LOT #	NAME OF EASEMENT HOLDER	<u>MAILING ADDRESS</u>

PLANNING BOARD FEE SCHEDULE/INVOICE

(Revised July 1, 2021)

Below are the fees associated with plan review and are subject to a nonrefundable application fee to cover administrative expenses. Please complete the information below and provide payment with your application submittal. **Plan Review Fees shall be paid prior to technical review committee (TRC) being scheduled.** For plans not requiring TRC review, **fees are due 21 days prior** to the Planning Board meeting. Staff will coordinate abutter/notice fees, which will be invoiced and must be paid 28 hours before the Planning Board meeting for an application to be heard. Fees shall be paid by cash or check made payable to "City of Dover".

A. Plan Review Fees

1. Application fee for the following (SELECT ALL THAT APPLY):

- ☐ SUBDIVISION Application fee \$200.00 + \$150.00 x # _____ new lots created = \$ _____
- ☐ LOT LINE ADJUSTMENT Application fee \$200.00 + \$100.00 X # _____ of lots involved = \$ _____
- ☐ TRANSFER OF DEVELOPMENT RIGHTS Application fee \$200.00 = \$ _____
- ☐ SITE REVIEW – RESIDENTIAL Application fee \$200.00+ \$100.00 x # _____ per dwelling unit = \$ _____
- ☐ SITE REVIEW – NON-RESIDENTIAL Application fee \$200.00 + (not to exceed \$10,000)
 - ☐ New construction \$.15 sq. ft. x # _____ sq. ft.= \$ _____
 - ☐ Additions (new floor space) \$.10 per sq. ft. x # _____ sq. ft.= \$ _____
- ☐ MOTEL/HOTEL \$35.00 x # _____ per lodging unit= \$ _____
- ☐ CHANGE OF USE Application fee \$200.00 + (not to exceed \$5,000)
 - ☐ Existing floor spaces \$.10 per sq. ft. x # _____ sq. ft. = \$ _____
- ☐ CONDITIONAL USE PERMIT Application fee \$200.00 x # 1 per Application = \$ 200
- ☐ GRAVEL PIT/ EXCAVATIONS
 - ☐ Application fee \$50.00= \$ _____
 - ☐ Permit fee \$75.00= \$ _____
- ☐ EXTENSIONS/AMENDMENTS/WAIVERS FOR AN APPROVED PLAN Application fee \$200.00 = \$ _____
- ☐ REQUEST FOR REZONING Application fee \$200.00 = \$ _____
- ☐ DRIVEWAY WAIVER Application fee \$200.00 = \$ _____

2. TOTAL IMPERVIOUS PAVED AREA (for new development, roadways or additions to

existing parking lots, (not to exceed \$10,000)) Application fee of \$200.00 is N/A if it is part

of a Site Review or Subdivision Plan. \$200.00 + \$.07 per sq. ft. x # _____ sq. ft. = \$ _____

SUBTOTAL PLAN REVIEW FEE (A) = \$ 200

AND

B. Abutter Notification/Mailing Labels - this office will create and print the abutter list and provide labels in triplicate for each abutter. The applicant/owner will review the list for accuracy and provide to us the engineer, architect, licensed land surveyor (LLS), licensed landscape architect (LLA) and/or soil scientist whose professional seal appears on the plan with names and addresses for notices.

- ☐ Applicant & Owner, engineer, architect, LLS, LLA and/or soil scientist
 - ☐ Certified letters fee # _____ of x \$8.00= \$ _____
- ☐ Certified letters fee: # of abutters _____ X \$8.00= \$ _____
- ☐ First Class Mail fee (for individual owner of units within a condominium or other collective form of ownership): # of abutters _____ X \$1.00= \$ _____
- ☐ Creating/Printing Abutter Labels in triplicate per sheet _____ x \$10.00= \$ _____

C. Foster's newspaper public notice fee \$100.00 x # _____ applications = \$ _____

SUBTOTAL NOTICE FEE (B & C) = \$ _____

TOTAL INVOICE AMOUNT (A, B & C) = \$ _____

PLAN REVIEW FEE COLLECTED/PAID = \$ _____

BALANCE DUE = \$ _____

The balance due must be paid 28 hours prior to the Planning Board Meeting, to be heard.



PERMIT SNAPSHOT REPORT COND-2025-0007 FOR CITY OF DOVER, N.H.

Permit Type: Conditional Use
Work Class: Environmental
Status: In Review
Valuation: \$0.00
Project:
District: None
Square Feet: 0.00
Assigned To: Edgecomb, Makayla
App Date: 04/04/2025
Exp Date: NOT AVAILABLE
Completed: NOT COMPLETED
Approval Expire Date:

Description: Conditional Use Permit (CUP) application for relief to the secondary groundwater protection district requirement of the maximum impervious cover of 20% within the secondary groundwater protection area. We have calculated the proposed impervious coverage with the Secondary Groundwater Protection District to be 25% where 20% is permitted without a Conditional Use Permit.

Parcel: F0003-000000	Main	Address: 210 Tolend Rd Dover, NH	Main	Zone: IT(Non-Residential - Innovative Technology) R-40(Residential - Rural)
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Plan Preparer Tritech Engineering Corp. 755 Central Avenue Dover, NH 03820 Business: (603) 742-8107	Applicant Tritech Engineering Corp. 755 Central Avenue Dover, NH 03820 Business: (603) 742-8107	Wetlands Scientist Michael Mariano 75 Prospect Street Somersworth, NH Business: (609) 692-4457	Owner Stonearch Development Corp Business: (978) 375-3153
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Permit Custom Fields

Select Permit Type	Groundwater Protection	General Purpose	New Construction	Project Zone	Residential
What is the parcel zoned?	R-40	New Change in Impervious/Paved Area (sq ft)	41000	Work	Construction of homes, driveways and roadway associated with the Ambrose Woods Open Space Subdivision.
permitsstatefed	NHDES AoT				

Attachment File Name	Added On	Added By	Attachment Group	Notes
Signature_Robert_Stowell_4/4/2025.jpg	04/04/2025 11:28	Stowell, Robert		Uploaded via CSS
Permit Snapshot Report.pdf	04/04/2025 11:28	Service, EnerGov		Attached by IO - ATTACH: Initial Permit Snapshot

Invoice No.	Fee	Fee Amount	Amount Paid
INV-2025011868	Planning Impervious Paved Area Fee	\$2,870.00	\$0.00
	Planning General Application Fee	\$200.00	\$0.00
Total for Invoice INV-2025011868		\$3,070.00	\$0.00
Grand Total for Permit		\$3,070.00	\$0.00

Submittal Name	Status	Received Date	Due Date	Complete Date	Resubmit	Completed
Conditional Use Review v.1	In Review	04/04/2025	04/07/2025		No	No
Item Review Name	Department	Assigned User	Status	Assigned Date	Due Date	Completed Date
Planning	Planning	Edgecomb, Makayla	In Review	04/04/2025	05/02/2025	

Workflow Step / Action Name	Action Type	Start Date	End Date
Review v.1		04/04/2025 13:10	
Confirm application complete v.1	Generic Action		04/04/2025 13:11
Conditional Use Review v.1	Receive Submittal	04/04/2025 0:00	

Planning Board v.1

Planning Board Agenda v.1	Task
Invoice for Notices v.1	Task
Send Notices v.1	Task
Planner Creates Staff Recommendations v.1	Permit Activity

PERMIT SNAPSHOT REPORT (COND-2025-0007)

Distribute Planning Board Materials v.1	Task
Planning Board Hearing v.1	Hold Hearing
Planning Board Decision v.1	Permit Activity
NOD Sent to Applicant v.1	Create Report
Issue Permit v.1	
Verify Fees Prior to Permit v.1	Generic Action
Issue and Review Permit v.1	Generic Action
Print and Email Permit v.1	Generic Action
Plans uploaded to Treeno v.1	Generic Action
Internal Notification of Plan Completion v.1	Generic Action
Recording v.1	Task

TRITECH

ENGINEERING CORPORATION

755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820

TELEPHONE 603.742.8107
FACSIMILE 603.742.3830

April 4, 2025

Donna Benton, AICP
Director of Planning & Community Development
City of Dover, Planning Department
288 Central Avenue
Dover, New Hampshire 03820

Subject: Conditional Use Permit Application
210 Tolend Road, LLC
210 Tolend Road & Emerald Lane
Dover Tax Map F Lot 3
Dover, New Hampshire
Job No. 23118

Dear Donna:

On behalf of our client, 210 Tolend Road LLC, we are submitting this Conditional Use Permit (CUP) application for relief to the secondary groundwater protection district requirement of the maximum impervious cover of 20% within the secondary groundwater protection area.

Sheet CUP-1 depicts the limits of the secondary groundwater protection area and the proposed impervious improvements proposed within the area. We have calculated the proposed impervious coverage with the Secondary Groundwater Protection District to be 25% where 20% is permitted without a Conditional Use Permit.

The applicant has worked with Planning staff, Planning Board and abutters to develop this very thoughtful and efficiently designed project. The project is proposed as an Open Space Subdivision. This is the City's preferred development style specifically for the environmental benefits associated with it. In addition, the project is designed with NO WETLAND OR WETLAND BUFFER IMPACTS.

By contrast, the yield plan that was vetted by the Planning Board at their December, 10 2024 Planning Board meeting had both wetland and wetland buffer impacts but would comply with the secondary groundwater protection standards.

Development always creates impacts. The goal is to limit these impacts to the greatest extent possible. We believe this design achieves this goal. The secondary groundwater protection district does allow for development with impervious cover greater than 20% by conditional use permit.

170-33(D)(5)

In soils that are excessively drained, well-drained, moderately well-drained or somewhat poorly drained, as defined by a site-specific soil survey completed in accordance with the standards of the Society of Soil Scientists of Northern New England, the development shall not make impervious to water more than 20% of the area of said soils except as provided for below. Any development in the secondary groundwater protection zone that proposes a total impervious surface greater than 20% shall only be permitted if the Planning Board grants a conditional use permit per Subsection E(4). In reviewing a conditional use permit application filed under this provision, the Planning Board shall require that the proposed development plan incorporates a stormwater drainage plan, approved by the Planning Board and prepared by a

professional engineer certified to practice in the State of New Hampshire. The plan shall provide for the retention and percolation within the secondary groundwater protection zone of all development-generated stormwater runoff from a ten-year storm.

Attached please find, Post Construction Drainage Plan, D-3a and Post Construction Drainage Analysis for the 10-Year Storm event. These demonstrate that the entire rainfall from a 10-year storm is retained and percolated within Bioretention Basin #4, which is located within the secondary groundwater protection zone. This treatment and infiltration process is intended to mitigate for the impervious coverage and provide for the desired groundwater recharge.

170-33(E)(4)

Conditional use permits. The Planning Board, after receiving a recommendation from the Conservation Commission, may vary the provisions herein by granting a conditional use permit in accordance with RSA 674:21. Along with the conditional use permit application, the applicant shall submit expert technical information from a professional engineer, hydrologist or geologist that documents that the requested relief is consistent with the stated purpose and intent of this chapter. Such technical information shall include an environmental protection plan consistent with the regulated substance management requirements of the New Hampshire Department of Environmental Services Best Management Practices for Groundwater Protection (Part Env-Wq 401).

The Ambrose Woods project will require an Alteration of Terrain Permit from NHDES and has been designed to meet all Best Management Practices under those regulations. Specifically, Bioretention Basin #4 is designed to meet the Teir 1 SCM standards, which removes 80% the total suspended solid (TSS) and 60% of the total nitrogen (TN). This Development will also be reviewed by City of Dover staff and shall include an Inspection and maintenance (I & M) plan that provides for on-going monitoring of all proposed BMPs. The I&M is submitted to the city annually.

170-33(G) – Development Review

All developments to which Subsection F, Performance standards, above, applies shall complete the calculations as specified in the Development Review Model.

Attached please find the City of Dover, Development Review Model Calculations. These calculations demonstrate that the design meets the requirements of the review model.

Attached please find the supporting documentation:

- Conditional Use Permit Application.
- Conditional Use Permit Plan, Sheet CUP-1.
- Post Construction Drainage Plan, Sheet D-3a.
- Post Construction Drainage Analysis, 10-Year Strom Event.
- City of Dover, Development Review Model.

We look forward to discussing this application with the Conservation Commission at the April 14th meeting

Please advise should you have any questions.

Very truly yours,
TRITECH ENGINEERING CORP.

Robert J. Stowell, P.E., L.L.S.
President

RJS/cmp

Attachments

Table 1. City of Dover, NH : Development Review Model

Project Location:	Ambrose Woods	
<u>INPUT FACTORS</u>		
Project Total Land Area (acres)	3.87	Area within Secondary GPD Only
Number of Residential units	7	
Number of Bedrooms per Residence	0	(City Sewer)
On-Site Sewage Flow per Residence (gal/day)	0	(City Sewer)
N-Conc. in Effluent (mg/l)	35	
Lawn Area per Residence (sq ft)	6,500	
Pavement Area per Residence (sq ft)	880	
Roof Area per Residence (square feet)	2,145	
Number of Commercial Lots	0	
Total On-Site Sewage Flow from Commercial Lots (gal/day)	0	
Lawn Area per Commercial Lot (sq ft)	0	
Pavement Area per Commercial Lot (sq ft)	0	
Roof Area per Commercial Lot (sq ft)	0	
Total Road Area in Development (sq ft)	16,305	
Total Pervious Area (acres)	2.93	
Total Impervious Area (acres)	0.94	
Recharge Rate for Pervious Area (in/yr)	21.5	
Recharge Rate for Impervious Area (in/yr)	38.7	
Impervious Area Outside of Development Draining Into Area via Catchbasins (sq ft)	0	
Impervious Area Within Development Draining from Area via Catchbasins (sq ft)	0.9	

Table 1. City of Dover, NH : Development Review Model

INPUT	CALCULATIONS	RESULTS
Sewage (gal/day)		CALCULATED LOADING (LBS/YR)
0	x N-conc (mg/l) x 3.785 L/gal x 365 days/yr ÷ 454000 mg/lb	0
Lawn area (sq ft)		
45,500	x 0.0009 lb N/sq ft	41
Pavement area (sq ft)		
22,464	x 0.00031 lb N/sq ft	7
Roof area (sq ft)		
15,015	x 0.00015 lb N/sq ft	2
Natural area (acres)		
2	x 43560 sq ft/acre x 0.000005 lb N/sq ft	0
Storm Drainage input Area (sq ft)		
0	x 0.00031 lb N/sq ft	0
	TOTAL NITROGEN LOADING (LBS/YR)	51
		TOTAL RECHARGE (MG/YR)
Recharge from Sewage (gal/day)		
0	x 365 days/yr : 1,000,000 gal/million gal	0.00
Total Pervious Area (sq ft)		
127,631	x 21.5 in/yr /12 in/ft x 7.48 gal/cu ft : 1,000,000 gal/million gal	1.71
Total Impervious Area (sq ft)		
37,479	x 38.7 in/yr /12 in/ft x 7.48 gal/cu ft : 1,000,000 gal/million gal	0.90
Net Recharge from Stormdrains (gal/yr)		
-22	1,000,000 gal/million gal	0.00

TOTAL RECHARGE Pre- Development (MGAL/YR)	2.26
TOTAL RECHARGE Post- Development (MGAL/YR)	2.61
% Pre to Post Development Recharge Discrepancy	15.73

Note : Post- Development must be > = Pre- Development Recharge

TOTAL NITROGEN LOAD/TOTAL RECHARGE X 454,000 MG/LB / 3,785,000 L/MGAL	
Post- Dev NITROGEN Concentration (mg/l or ppm)	2.32
Nitrogen Concentration Guideline (mg/L or ppm)	5.00
Nitrogen Concentration +/- Guideline (mg/L or ppm)	-2.68

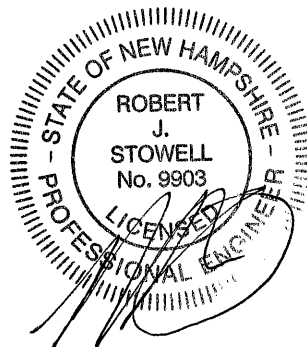
PREPARED BY HORSLEY & WITTEN, INC.
June 1999

STORMWATER ANALYSIS
for
Conditional Use Permit Application
Secondary Groundwater Protection District
10-Year Storm Event
NARRATIVE
for

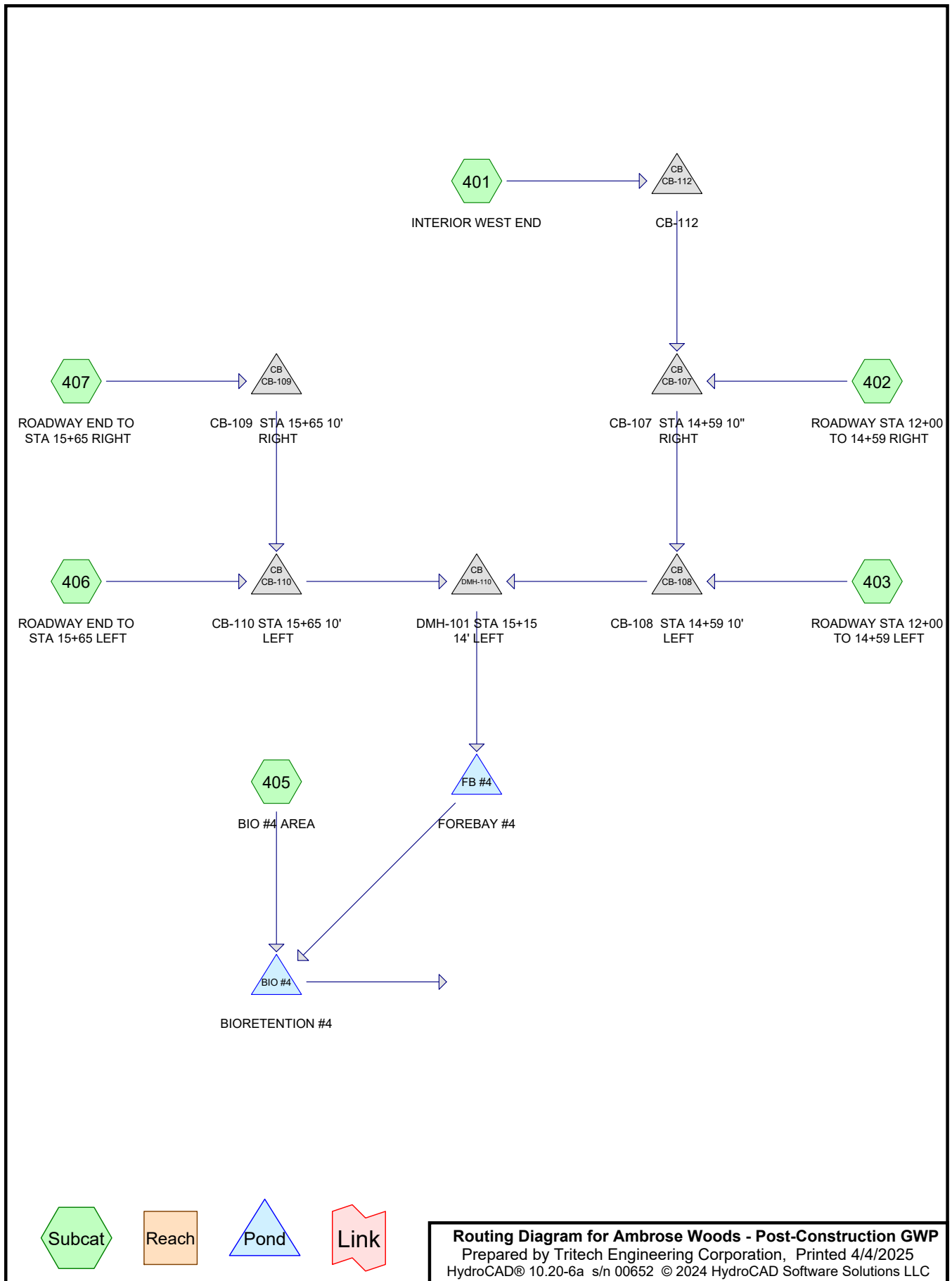
AMBROSE WOODS
210 TOLEND ROAD AND EMERALD LANE
DOVER, NEW HAMPSHIRE
APRIL, 2025

PREPARED FOR
210 TOLEND ROAD, LLC

42 J DOVER POINT ROAD
DOVER, NEW HAMPSHIRE 03820



PREPARED BY
TRITECH ENGINEERING CORPORATION
755 CENTRAL AVENUE
DOVER, NEW HAMPSHIRE 03820



Ambrose Woods - Post-Construction GWP

Prepared by Trittech Engineering Corporation

Printed 4/4/2025

HydroCAD® 10.20-6a s/n 00652 © 2024 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-YR SEACOAST	Type III 24-hr		Default	24.00	1	5.43	2

Summary for Subcatchment 401: INTERIOR WEST END

Runoff = 2.79 cfs @ 12.20 hrs, Volume= 0.256 af, Depth= 2.99"
 Routed to Pond CB-112 : CB-112

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

Area (sf)	CN	Description
1,865	98	Roofs, HSG B
5,500	61	>75% Grass cover, Good, HSG B
6,523	98	Roofs, HSG C
30,919	74	>75% Grass cover, Good, HSG C
44,807	77	Weighted Average
36,419		81.28% Pervious Area
8,388		18.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	100	0.0100	0.14		Sheet Flow, Sheet Grass Grass: Short n= 0.150 P2= 3.60"
1.9	140	0.0300	1.21		Shallow Concentrated Flow, Sc Grass Short Grass Pasture Kv= 7.0 fps
14.1	240	Total			

Summary for Subcatchment 402: ROADWAY STA 12+00 TO 14+59 RIGHT

Runoff = 1.79 cfs @ 12.09 hrs, Volume= 0.130 af, Depth= 3.47"
 Routed to Pond CB-107 : CB-107 STA 14+59 10" RIGHT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
 Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

Area (sf)	CN	Description
2,450	98	Roofs, HSG C
1,897	98	Paved parking, HSG C
7,478	74	>75% Grass cover, Good, HSG C
290	98	Roofs, HSG B
3,620	98	Paved parking, HSG B
3,900	61	>75% Grass cover, Good, HSG B
19,635	82	Weighted Average
11,378		57.95% Pervious Area
8,257		42.05% Impervious Area

Ambrose Woods - Post-Construction GWP Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

Prepared by Trittech Engineering Corporation

Printed 4/4/2025

HydroCAD® 10.20-6a s/n 00652 © 2024 HydroCAD Software Solutions LLC

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	65	0.0300	0.19		Sheet Flow, Sheet Grass Grass: Short n= 0.150 P2= 3.60"
0.5	35	0.0200	1.18		Sheet Flow, Sheet Pave Smooth surfaces n= 0.011 P2= 3.60"
0.4	72	0.0200	2.87		Shallow Concentrated Flow, SC Pave Paved Kv= 20.3 fps
6.5	172	Total			

Summary for Subcatchment 403: ROADWAY STA 12+00 TO 14+59 LEFT

Runoff = 1.53 cfs @ 12.09 hrs, Volume= 0.111 af, Depth= 3.47"
Routed to Pond CB-108 : CB-108 STA 14+59 10' LEFT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

Area (sf)	CN	Description
225	98	Roofs, HSG C
6,128	98	Paved parking, HSG B
6,970	61	>75% Grass cover, Good, HSG B
1,365	98	Roofs, HSG B
1,066	98	Roofs, HSG D
870	80	>75% Grass cover, Good, HSG D
115	98	Paved parking, HSG D
16,739	82	Weighted Average
7,840		46.84% Pervious Area
8,899		53.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	56	0.0250	0.18		Sheet Flow, Sheet Grass Grass: Short n= 0.150 P2= 3.60"
0.4	30	0.0200	1.15		Sheet Flow, Sheet Pave Smooth surfaces n= 0.011 P2= 3.60"
0.3	15	0.0200	1.00		Sheet Flow, Sheet Pave Smooth surfaces n= 0.011 P2= 3.60"
0.4	64	0.0200	2.87		Shallow Concentrated Flow, SC Pave Paved Kv= 20.3 fps
6.4	165	Total			

Summary for Subcatchment 405: BIO #4 AREA

Runoff = 1.25 cfs @ 12.09 hrs, Volume= 0.092 af, Depth= 1.95"
Routed to Pond BIO #4 : BIORETENTION #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

Ambrose Woods - Post-Construction GWP Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

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Area (sf)	CN	Description
21,770	61	>75% Grass cover, Good, HSG B
1,528	98	Roofs, HSG B
1,105	98	Roofs, HSG C
70	74	>75% Grass cover, Good, HSG C
254	80	>75% Grass cover, Good, HSG D
24,727	65	Weighted Average
22,094		89.35% Pervious Area
2,633		10.65% Impervious Area

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

Summary for Subcatchment 406: ROADWAY END TO STA 15+65 LEFT

Runoff = 1.47 cfs @ 12.09 hrs, Volume= 0.108 af, Depth= 4.18"
Routed to Pond CB-110 : CB-110 STA 15+65 10' LEFT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

Area (sf)	CN	Description
35	98	Roofs, HSG B
2,000	98	Paved parking, HSG B
175	61	>75% Grass cover, Good, HSG B
1,400	98	Roofs, HSG C
5,080	98	Paved parking, HSG C
4,832	74	>75% Grass cover, Good, HSG C
13,522	89	Weighted Average
5,007		37.03% Pervious Area
8,515		62.97% Impervious Area

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

Summary for Subcatchment 407: ROADWAY END TO STA 15+65 RIGHT

Runoff = 1.35 cfs @ 12.10 hrs, Volume= 0.100 af, Depth= 3.67"
Routed to Pond CB-109 : CB-109 STA 15+65 10' RIGHT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

Ambrose Woods - Post-Construction GWP Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

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Area (sf)	CN	Description
1,930	98	Roofs, HSG C
4,370	98	Paved parking, HSG C
6,157	74	>75% Grass cover, Good, HSG C
555	98	Paved parking, HSG B
1,305	61	>75% Grass cover, Good, HSG B
14,317	84	Weighted Average
7,462		52.12% Pervious Area
6,855		47.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	45	0.0150	0.14		Sheet Flow, Sheet Grass Grass: Short n= 0.150 P2= 3.60"
0.7	55	0.0200	1.29		Sheet Flow, Sheet Pave Smooth surfaces n= 0.011 P2= 3.60"
0.7	145	0.0300	3.52		Shallow Concentrated Flow, SC Pave Paved Kv= 20.3 fps
6.9	245	Total			

Summary for Pond BIO #4: BIORETENTION #4

Inflow Area = 3.185 ac, 31.92% Impervious, Inflow Depth = 2.84" for 10-YR SEACOAST event
 Inflow = 9.65 cfs @ 12.12 hrs, Volume= 0.754 af
 Outflow = 0.63 cfs @ 14.54 hrs, Volume= 0.746 af, Atten= 93%, Lag= 145.6 min
 Discarded = 0.63 cfs @ 14.54 hrs, Volume= 0.746 af
 Primary = 0.00 cfs @ 14.54 hrs, Volume= 0.000 af
 Routed to Reach 2001 : FLOW THROUGH WOODS TO WETLANDS

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
 Peak Elev= 162.61' @ 14.54 hrs Surf.Area= 8,508 sf Storage= 17,412 cf
 Flood Elev= 163.50' Surf.Area= 9,750 sf Storage= 25,509 cf

Plug-Flow detention time= 320.1 min calculated for 0.746 af (99% of inflow)
 Center-of-Mass det. time= 313.3 min (1,155.4 - 842.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	158.74'	25,509 cf	Bioretention (Conic) Listed below (Recalc)		

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
158.74	5,785	0.0	0	0	5,785
158.75	5,785	40.0	23	23	5,788
158.99	5,785	40.0	555	579	5,852
159.00	5,785	20.0	12	590	5,855
160.49	5,785	20.0	1,724	2,314	6,257
160.50	5,785	100.0	58	2,372	6,260
162.00	7,700	100.0	10,080	12,451	8,223
163.50	9,750	100.0	13,057	25,509	10,333

Ambrose Woods - Post-Construction GWP Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	158.74'	3.000 in/hr Exfiltration over Wetted area Phase-In= 0.10'
#2	Primary	158.65'	
			12.0" Round Culvert L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 158.65' / 158.05' S= 0.0100 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	163.00'	0.5" x 4.5" Horiz. Orifice/Grate X 14.00 columns X 4 rows C= 0.600 in 24.0" x 24.0" Grate (22% open area) Limited to weir flow at low heads
#4	Primary	162.60'	
			12.0" W x 4.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.63 cfs @ 14.54 hrs HW=162.61' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.63 cfs)**Primary OutFlow** Max=0.00 cfs @ 14.54 hrs HW=162.61' TW=157.52' (Dynamic Tailwater)↑ **2=Culvert** (Passes 0.00 cfs of 6.75 cfs potential flow)↑ **3=Orifice/Grate** (Controls 0.00 cfs)↑ **4=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.36 fps)**Summary for Pond CB-107: CB-107 STA 14+59 10" RIGHT**

Inflow Area = 1.479 ac, 25.83% Impervious, Inflow Depth = 3.13" for 10-YR SEACOAST event
Inflow = 4.12 cfs @ 12.14 hrs, Volume= 0.386 af
Outflow = 4.12 cfs @ 12.14 hrs, Volume= 0.386 af, Atten= 0%, Lag= 0.0 min
Primary = 4.12 cfs @ 12.14 hrs, Volume= 0.386 af
Routed to Pond CB-108 : CB-108 STA 14+59 10' LEFT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Peak Elev= 165.61' @ 12.13 hrs

Flood Elev= 169.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	164.40'	18.0" Round P-109 L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 164.40' / 164.00' S= 0.0200 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.18 cfs @ 12.14 hrs HW=165.61' TW=165.22' (Dynamic Tailwater)↑ **1=P-109** (Outlet Controls 4.18 cfs @ 3.74 fps)**Summary for Pond CB-108: CB-108 STA 14+59 10' LEFT**

Inflow Area = 1.864 ac, 31.47% Impervious, Inflow Depth = 3.20" for 10-YR SEACOAST event
Inflow = 5.51 cfs @ 12.12 hrs, Volume= 0.497 af
Outflow = 5.51 cfs @ 12.12 hrs, Volume= 0.497 af, Atten= 0%, Lag= 0.0 min
Primary = 5.51 cfs @ 12.12 hrs, Volume= 0.497 af
Routed to Pond DMH-110 : DMH-101 STA 15+15 14' LEFT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Ambrose Woods - Post-Construction GWP Type III 24-hr 10-YR SEACOAST Rainfall=5.43"

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Peak Elev= 165.24' @ 12.12 hrs

Flood Elev= 169.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	163.90'	18.0" Round P-110 L= 58.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 163.90' / 163.30' S= 0.0103 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.53 cfs @ 12.12 hrs HW=165.24' TW=164.57' (Dynamic Tailwater)↑**1=P-110** (Outlet Controls 5.53 cfs @ 4.39 fps)**Summary for Pond CB-109: CB-109 STA 15+65 10' RIGHT**

Inflow Area = 0.329 ac, 47.88% Impervious, Inflow Depth = 3.67" for 10-YR SEACOAST event
Inflow = 1.35 cfs @ 12.10 hrs, Volume= 0.100 af
Outflow = 1.35 cfs @ 12.10 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.0 min
Primary = 1.35 cfs @ 12.10 hrs, Volume= 0.100 af
Routed to Pond CB-110 : CB-110 STA 15+65 10' LEFT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Peak Elev= 167.24' @ 12.10 hrs

Flood Elev= 170.67'

Device	Routing	Invert	Outlet Devices
#1	Primary	166.55'	12.0" Round P-111 L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 166.55' / 166.15' S= 0.0200 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.36 cfs @ 12.10 hrs HW=167.24' TW=166.90' (Dynamic Tailwater)↑**1=P-111** (Outlet Controls 1.36 cfs @ 3.29 fps)**Summary for Pond CB-110: CB-110 STA 15+65 10' LEFT**

Inflow Area = 0.639 ac, 55.21% Impervious, Inflow Depth = 3.92" for 10-YR SEACOAST event
Inflow = 2.82 cfs @ 12.09 hrs, Volume= 0.209 af
Outflow = 2.82 cfs @ 12.09 hrs, Volume= 0.209 af, Atten= 0%, Lag= 0.0 min
Primary = 2.82 cfs @ 12.09 hrs, Volume= 0.209 af
Routed to Pond DMH-110 : DMH-101 STA 15+15 14' LEFT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs

Peak Elev= 166.91' @ 12.09 hrs

Flood Elev= 170.67'

Device	Routing	Invert	Outlet Devices
#1	Primary	166.05'	15.0" Round P-112 L= 52.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 166.05' / 163.30' S= 0.0529 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.82 cfs @ 12.09 hrs HW=166.91' TW=164.56' (Dynamic Tailwater)
 ↑1=P-112 (Inlet Controls 2.82 cfs @ 3.15 fps)

Summary for Pond CB-112: CB-112

Inflow Area = 1.029 ac, 18.72% Impervious, Inflow Depth = 2.99" for 10-YR SEACOAST event
 Inflow = 2.79 cfs @ 12.20 hrs, Volume= 0.256 af
 Outflow = 2.79 cfs @ 12.20 hrs, Volume= 0.256 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.79 cfs @ 12.20 hrs, Volume= 0.256 af
 Routed to Pond CB-107 : CB-107 STA 14+59 10" RIGHT

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
 Peak Elev= 167.85' @ 12.20 hrs
 Flood Elev= 171.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	167.00'	15.0" Round P-108 L= 135.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 167.00' / 164.50' S= 0.0185 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.79 cfs @ 12.20 hrs HW=167.85' TW=165.53' (Dynamic Tailwater)
 ↑1=P-108 (Inlet Controls 2.79 cfs @ 3.14 fps)

Summary for Pond DMH-110: DMH-101 STA 15+15 14' LEFT

Inflow Area = 2.503 ac, 37.53% Impervious, Inflow Depth = 3.38" for 10-YR SEACOAST event
 Inflow = 8.25 cfs @ 12.11 hrs, Volume= 0.706 af
 Outflow = 8.25 cfs @ 12.11 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.0 min
 Primary = 8.25 cfs @ 12.11 hrs, Volume= 0.706 af
 Routed to Pond FB #4 : FOREBAY #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
 Peak Elev= 164.58' @ 12.11 hrs
 Flood Elev= 170.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	163.20'	24.0" Round P-113 L= 154.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 163.20' / 161.50' S= 0.0110 '/ Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=8.23 cfs @ 12.11 hrs HW=164.57' TW=163.35' (Dynamic Tailwater)
 ↑1=P-113 (Outlet Controls 8.23 cfs @ 5.04 fps)

Summary for Pond FB #4: FOREBAY #4

Inflow Area = 2.618 ac, 36.53% Impervious, Inflow Depth = 3.33" for 10-YR SEACOAST event
 Inflow = 8.52 cfs @ 12.11 hrs, Volume= 0.726 af
 Outflow = 8.45 cfs @ 12.12 hrs, Volume= 0.662 af, Atten= 1%, Lag= 0.8 min
 Primary = 8.45 cfs @ 12.12 hrs, Volume= 0.662 af
 Routed to Pond BIO #4 : BIORETENTION #4

Routing by Dyn-Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.01 hrs
 Peak Elev= 163.36' @ 12.12 hrs Surf.Area= 1,767 sf Storage= 3,377 cf
 Flood Elev= 163.50' Surf.Area= 1,830 sf Storage= 3,638 cf

Plug-Flow detention time= 66.8 min calculated for 0.662 af (91% of inflow)
 Center-of-Mass det. time= 22.7 min (840.2 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1	160.50'	3,638 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.50	660	0	0
162.00	1,180	1,380	1,380
163.50	1,830	2,258	3,638

Device	Routing	Invert	Outlet Devices
#1	Primary	163.00'	16.0' long x 7.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=8.45 cfs @ 12.12 hrs HW=163.36' TW=161.17' (Dynamic Tailwater)
 ↑1=Broad-Crested Rectangular Weir (Weir Controls 8.45 cfs @ 1.49 fps)