Nitsch Engineering

September 21, 2022

NOTICE OF INTENT

Under the *Wetlands Protection Act* (M.G.L. c. 131, §40),
the *Rivers Protection Act* (M.G.L. c. 256, Acts of 1996)
and their Regulations (310 CMR 10.00),

For:
OLMSTED GREEN COMMUNITY FIELD
550 Morton Street
Mattapan, MA 02131

Prepared for:

BROOKE CHARTER SCHOOL
190 Cummins Highway
Roslindale, MA 02131

Prepared by:

NITSCH ENGINEERING, INC.
2 Center Plaza Suite 430
Boston, MA 02108

Nitsch Project #14017

TABLE OF CONTENTS

SECTION 1

NOTICE OF INTENT FORMS

WPA Form 3 - Notice of Intent
NOI Wetland Fee Transmittal Form
Climate Change Resiliency and Preparedness Checklist

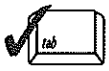
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Boston
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

550 Morton Street	Boston	02124
a. Street Address	b. City/Town	c. Zip Code

Latitude and Longitude:

42.291736 N	-71.095354 W
d. Latitude	e. Longitude

1405196970	Parcel 2B-9
f. Assessors Map/Plat Number	g. Parcel /Lot Number

2. Applicant:

Mark	Loring
a. First Name	b. Last Name

Brooke Charter School
c. Organization

190 Cummins Highway
d. Street Address

Roslindale	MA	02131
e. City/Town	f. State	g. Zip Code

617-325-7977		mloring@ebrooke.org
h. Phone Number	i. Fax Number	j. Email Address

3. Property owner (required if different from applicant): ☒ Check if more than one owner

Jerry	Rappaport
a. First Name	b. Last Name

Lena New Boston, LLC
c. Organization

53 State Street, Suite 500
d. Street Address

Boston	MA	02109
e. City/Town	f. State	g. Zip Code

617-723-7760		jerry@newbostonfund.com
h. Phone Number	i. Fax Number	j. Email address

4. Representative (if any):

Annie	Cornell
a. First Name	b. Last Name

Nitsch Engineering, Inc.
c. Company

2 Center Plaza, Suite 430
d. Street Address

Boston	MA	02108
e. City/Town	f. State	g. Zip Code

857-206-8758		acornell@nitscheng.com
h. Phone Number	i. Fax Number	j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

$1,937.50	$137.50	$1,800.00
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boston
City/Town

A. General Information (continued)

6. General Project Description:

The project involves the construction of a new community field, walkway, bathroom building, seating, storage area, and driveway. Other site improvements include installation of new utilities to support the proposed site and construction of new stormwater management systems.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☒ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

a. County	b. Certificate # (if registered land)
Suffolk	
c. Book	**d. Page Number**
40864	221

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boston
City/Town

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☒ Bordering Vegetated Wetland	27,708 1. square feet	0 2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☒ Riverfront Area	Canterbury Brook 1. Name of Waterway (if available) - **specify coastal or inland**	

2. Width of Riverfront Area (check one):

☒ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 377 square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
377		

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☒ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☐ Yes ☒ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boston
City/Town

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 – Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Boston
City/Town

C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ☒ No **If yes, include proof of mailing or hand delivery of NOI to:**

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   b. Date of map

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☒ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☒ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Boston
City/Town

C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: dmf.envreview-south@mass.gov

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: dmf.envreview-north@mass.gov

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

c. ☐ Is this an aquaculture project? d. ☐ Yes ☐ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Boston
City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☐ A portion of the site constitutes redevelopment

      3. ☒ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 – Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Boston
City/Town

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

See Notice of Intent Report
a. Plan Title

b. Prepared By

c. Signed and Stamped by

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

057263	09/06/2022
2. Municipal Check Number	3. Check date
057264	09/06/2022
4. State Check Number	5. Check date
Nitsch Engineering, Inc	
6. Payor name on check: First Name	7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boston
City/Town

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant

2. Date 9/21/2022

3. Signature of Property Owner (if different)

4. Date 9/21/2022

5. Signature of Representative (if any)

6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

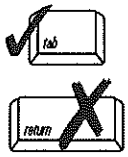
The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

550 Morton Street	Boston
a. Street Address	b. City/Town
057264	$137.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Mark		Loring	
a. First Name		b. Last Name	
Brooke Charter Scool			
c. Organization			
190 Cummins Highway			
d. Mailing Address			
Roslindale	MA	02131	
e. City/Town	f. State	g. Zip Code	
617-325-7977		mloring@ebrooke.org	
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

Jerry		Rappaport	
a. First Name		b. Last Name	
Lena New Boston, LLC			
c. Organization			
53 State Street, Suite 500			
d. Mailing Address			
Boston	MA	02109	
e. City/Town	f. State	g. Zip Code	
617-723-7760		jerry@newbostonfund.com	
h. Phone Number	i. Fax Number	j. Email Address	

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 2(j)	1	$300	$300
City of Boston Fee			$1,500

Step 5/Total Project Fee:

Step 6/Fee Payments:

Total Project Fee:	$1,937.50 (a. Total Fee from Step 5)
State share of filing Fee:	$137.50 (b. 1/2 Total Fee **less** $12.50)
City/Town share of filling Fee:	$1,800.00 (c. 1/2 Total Fee **plus** $12.50)

C. Submittal Requirements

a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

City/Town

Property Owner:

a. First Name | b. Last Name

Massachusetts Department of Transportation

c. Organization

10 Park Plaza

d. Street Address

Boston | MA | 02116

e. City/Town | f. State | g. Zip Code

h. Phone Number | f. Fax Number | j. Email address

Edward Mills As Agent for 9/28/22

Signature of Property Owner | Date

City of Boston
Environment

CITY of BOSTON
Conservation Commission

INSTRUCTIONS FOR COMPLETING APPLICATION
NOTICE OF INTENT – BOSTON NOI FORM (2021)

The Boston Notice of Intent Form is intended to be a supplement to the WPA Form 3 detailing impacts to locally designated wetland resource areas and buffer zones. Please read these instructions for assistance in completing the Notice of Intent application form. These instructions cover certain items on the Notice of Intent form that are not self-explanatory.

INSTRUCTIONS TO SECTION B: BUFFER ZONE AND RESOURCE AREA IMPACTS

Item 1. Buffer Zone Only. If you check the Buffer Zone Only box in this section you are indicating that the project is entirely in the Buffer Zone to a resource area ***under both*** the Wetlands Protection Act and Boston Wetlands Ordinance. If so, skip the remainder of Section B and go directly to Section C. Do not check this box if the project is within the Waterfront Area.

Item 2. The ***boundaries of coastal resource areas*** specific to the Ordinance can be found in Section II of the Boston Wetlands Regulations. You must also include the size of the proposed alterations (and proposed replacement areas) in each resource area.

Item 3. The ***boundaries of inland resource areas*** specific to the Ordinance can be found in Section II of the Boston Wetlands Regulations. You must also include the size of the proposed alterations (and proposed replacement areas) in each resource area.

INSTRUCTIONS TO SECTION C: OTHER APPLICABLE STANDARDS AND REQUIREMENTS

Item 1. Rare Wetland Wildlife Habitat. Except for Designated Port Areas, no work (including work in the Buffer Zone) may be permitted in any resource area that would have adverse effects on the habitat of rare, "state-listed" vertebrate or invertebrate animal species.

The most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife is published by the Natural Heritage and Endangered Species Program (NHESP). See: http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm or the *Massachusetts Natural Heritage Atlas.*

If any portion of the proposed project is located within Estimated Habitat, the applicant must send the Natural Heritage Program, at the following address, a copy of the Notice of Intent by certified mail or priority mail (or otherwise sent in a manner that guarantees delivery within two days), no later than the date of the filing of the Notice of Intent with the Conservation Commission.

Evidence of mailing to the Natural Heritage Program (such as Certified Mail Receipt or Certificate of Mailing for Priority Mail) must be submitted to the Conservation Commission along with the Notice of Intent.

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581-3336
508.792.7270

City of Boston Environment

NOTICE OF INTENT APPLICATION FORM
Boston Wetlands Ordinance
City of Boston Code, Ordinances, Chapter 7-1.4

Boston File Number

MassDEP File Number

A. GENERAL INFORMATION

1. Project Location

550 Morton Street	Boston	02124
a. Street Address	b. City/Town	c. Zip Code
1405196970	Parcel 2B-9	
f. Assessors Map/Plat Number	g. Parcel /Lot Number	

2. Applicant

Mark	Loring	Brooke Charter School
a. First Name	b. Last Name	c. Company
190 Cummins Highway		
d. Mailing Address		
Boston	MA	02131
e. City/Town	f. State	g. Zip Code
(617)325-7977		mloring@ebrooke.com
h. Phone Number	i. Fax Number	j. Email address

3. Property Owner

Jerry	Rappaport	Lena New Boston, LLC
a. First Name	b. Last Name	c. Company
53 State Street, Suite 500		
d. Mailing Address		
Boston	MA	02109
e. City/Town	f. State	g. Zip Code
(617)723-7760		jerry@newbostonfund.com
h. Phone Number	i. Fax Number	j. Email address

☑ Check if more than one owner

(If there is more than one property owner, please attach a list of these property owners to this form.)

4. Representative (if any)

John	Schmid	Nitsch Engineering, Inc.
a. First Name	b. Last Name	c. Company
2 Centre Plaza, Suite 430		
d. Mailing Address		
Boston	MA	02108
e. City/Town	f. State	g. Zip Code
(617)649-6116		jschmid@nitscheng.com
h. Phone Number	i. Fax Number	j. Email address

5. Is any portion of the proposed project jurisdictional under the Massachusetts Wetlands Protection Act M.G.L. c. 131 §40?

☑ Yes ☐ No

If yes, please file the WPA Form 3 - Notice of Intent with this form

6. General Information

The project involves the construction of a new community field, walkway, bathroom building, seating, storage area, and driveway. Other site improvements include installation of new utilities to support the proposed site and construction of new stormwater management systems.

7. Project Type Checklist

a. ☐ Single Family Home
b. ☐ Residential Subdivision
c. ☐ Limited Project Driveway Crossing
d. ☐ Commercial/Industrial
e. ☐ Dock/Pier
f. ☐ Utilities
g. ☐ Coastal Engineering Structure
h. ☐ Agriculture – cranberries, forestry
i. ☐ Transportation
j. ☒ Other

8. Property recorded at the Registry of Deeds

Suffolk	221
a. County	b. Page Number
40864	
c. Book	d. Certificate # (if registered land)

9. Total Fee Paid

$1,937.50	$137.50	$1,800
a. Total Fee Paid	b. WPA Fee Paid	c. Ordinance Fee Paid

B. BUFFER ZONE & RESOURCE AREA IMPACTS

Buffer Zone Only - Is the project located only in the Buffer Zone of a resource area protected by the Boston Wetlands Ordinance?

☐ Yes ☑ No

1. Coastal Resource Areas

Resource Area	Resource Area Size	Proposed Alteration*	Proposed Migitation
☐ *Coastal Flood Resilience Zone*	*Square feet*	*Square feet*	*Square feet*
☐ *25-foot Waterfront Area*	*Square feet*	*Square feet*	*Square feet*
☐ *100-foot Salt Marsh Area*	*Square feet*	*Square feet*	*Square feet*
☐ *Riverfront Area*	*Square feet*	*Square feet*	*Square feet*

2. Inland Resource Areas

Resource Area	Resource Area Size	Proposed Alteration*	Proposed Migitation
☐ *Inland Flood Resilience Zone*	*Square feet*	*Square feet*	*Square feet*
☐ *Isolated Wetlands*	*Square feet*	*Square feet*	*Square feet*
☐ *Vernal Pool*	*Square feet*	*Square feet*	*Square feet*
☐ *Vernal Pool Habitat (vernal pool + 100 ft. upland area)*	*Square feet*	*Square feet*	*Square feet*
☑ *25-foot Waterfront Area*	*Square feet*	7,237 *Square feet*	*Square feet*
☑ *Riverfront Area*	*Square feet*	377 *Square feet*	*Square feet*

C. OTHER APPLICABLE STANDARDS & REQUIREMENTS

1. What other permits, variances, or approvals are required for the proposed activity described herein and what is the status of such permits, variances, or approvals?

Awaiting Boston Water and Sewer Commission Order of Conditions

2. Is any portion of the proposed project located in Estimated Habitat of Rare Wildlife as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the Massachusetts Natural Heritage Atlas or go to http://www.mass.gov/dfwele/dfw/nhesp/nhregmap.htm.

☐ Yes ☑ No

If *yes*, the project is subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18).

A. Submit Supplemental Information for Endangered Species Review

☐ Percentage/acreage of property to be altered:

(1) within wetland Resource Area _____ percentage/acreage

(2) outside Resource Area _____ percentage/acreage

☐ Assessor's Map or right-of-way plan of site

3. Is any portion of the proposed project within an Area of Critical Environmental Concern?

☐ Yes ☑ No

If yes, provide the name of the ACEC: _____

4. Is the proposed project subject to provisions of the Massachusetts Stormwater Management Standards?

☑ Yes. *Attach a copy of the Stormwater Checklist & Stormwater Report as required.*
- ☐ *Applying for a Low Impact Development (LID) site design credits*
- ☐ *A portion of the site constitutes redevelopment*
- ☑ *Proprietary BMPs are included in the Stormwater Management System*

☐ No. *Check below & include a narrative as to why the project is exempt*
- ☐ *Single-family house*
- ☐ *Emergency road repair*
- ☐ *Small Residential Subdivision (less than or equal to 4 single family houses or less than or equal to 4 units in a multifamily housing projects) with no discharge to Critical Areas*

5. Is the proposed project subject to Boston Water and Sewer Commission Review?

☑ Yes ☐ No

D. SIGNATURES AND SUBMITTAL REQUIREMENTS

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the Wetlands Protection Ordinance.

Signature of Applicant	9/21/2022 Date
Signature of Property Owner (if different)	9/21/2022 Date
Signature of Representative (if any)	9/22/2022 Date

APPENDIX A. - STATUTORY REVIEW & APPROVAL CHECKLIST

Applicants submitting a Notice of Intent to the Boston Conservation Commission are also required to include a list of all permits and approvals either obtained, or necessary to be obtained, for the proposed activity. This checklist is not fully comprehensive but Applicants may utilize this checklist to fulfill this requirement. Any additional permits and approvals needed should be discussed in the narrative accompanying the Notice of Intent.

FEDERAL REVIEWS AND APPROVALS

NEEDED	OBTAINED	REGULATION	REVIEW BODY
☐	☐	National Environmental Policy Act (NEPA)	Varies
☐	☐	Section 404 Permit	U.S. Army Corps of Engineers
☐	☐	National Pollution Discharge Elimination System Permit (NPDES)	U.S. Environmental Protection Agency
☑	☐	Stormwater Construction General Permit	U.S. Environmental Protection Agency
☐	☐	Federal Endangered Species Act (ESA)	U.S. Fish and Wildlife Service or National Marine Fisheries Service
☐	☐	Federal Fisheries Regulations	National Marine Fisheries Service

COMMONWEALTH OF MASSACHUSETTS REVIEWS AND APPROVALS

NEEDED	OBTAINED	REGULATION	REVIEW BODY
☐	☐	Massachusetts Environmental Policy Act (MEPA)	Massachusetts Environmental Policy Act Office
☐	☐	Federal Consistency Review	Office of Coastal Zone Management
☐	☐	Massachusetts Public Waterfront Act (Chapter 91)	Massachusetts Department of Environmental Protection (Waterways Program)
☐	☐	Section 401 Water Quality Certification	Massachusetts Department of Environmental Protection (Wetlands Program)
☐	☐	Massachusetts Endangered Species Act (MESA)	National Heritage and Endangered Species Program
☐	☐	Massachusetts Marine Fisheries Regulations	Massachusetts Division of Marine Fisheries

☐	☐	Historic Preservation	Massachusetts Board of Underwater Archaeological Resources
☐	☐	Historic Preservation	Massachusetts Historical Commission
☐	☐	Massachusetts Contingency Plan	Massachusetts Department of Environmental Protection
☐	☐	Massachusetts Building Code Variance	Board of Building Regulations and Standards

CITY OF BOSTON LOCAL REVIEWS AND APPROVALS

NEEDED	OBTAINED	REGULATION	REVIEW BODY
☐	☐	Boston Zoning Code Article 80	Boston Planning and Development Agency
☐	☐	Boston Zoning Code	Inspectional Services Department
☐	☐	Boston Zoning Code Variance	Zoning Board of Appeals
☐	☐	Project Design Review	Civic Design Commission
☑	☐	Utility Plan Review	Boston Water and Sewer Commission
☐	☐	Boston Zoning Code Article 32 (GCOD)	Boston Groundwater Trust
☐	☐	Historic Preservation	Boston Landmarks Commission
☐	☐	Boston City Code (100 Foot Rule)	Boston Parks and Recreation Commission
☐	☐	Public Realm Improvements	Boston Public Improvement Commission
☐	☐	Parking Freeze/Abrasive Blasting	Boston Air Pollution Control Commission
☑	☐	Massachusetts Building Code	Inspectional Services Department

City of Boston
Environment

City of Boston
Mayor Martin J. Walsh

Property Owner:

a. First Name b. Last Name

Massachusetts Department of Transportation

c. Organization

10 Park Plaza

d. Street Address

Boston MA 02116

e. City/Town f. State g. Zip Code

h. Phone Number f. Fax Number j. Email address

[signature] As Agent For 9/21/22

Signature of Property Owner Date

boston planning & development agency

Climate Resiliency Checklist

NOT FOR FILING

NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

A.1 - Project Information

Project Name:	Olmsted Green			
Project Address:	Morton Street at American Legion Highway, Mattapan, MA			
Project Address Additional:				
Filing Type (*select*)	*Construction*			
Filing Contact	*Jerry Rappaport*	*Lena New Boston, LLC*	*jerry@newbostonfund.com*	*(617)723-7760*
Is MEPA approval required	*No*		*08/19/2022*	

A.3 - Project Team

Owner / Developer:	Brooke Charter Schools OPM :SV5
Architect:	NA
Engineer:	Nitsch Engineering, Inc
Sustainability / LEED:	NA
Permitting:	Nitsch Engineering, Inc
Construction Management:	TBD

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Bathroom
List the First Floor Uses:	2 Unisex Bathrooms and 1 Janitor Closet
List any Critical Site Infrastructure and or Building Uses:	NA

Site and Building:

Site Area:	*143,709 SF*	Building Area:	*200 SF*
Building Height:	*10 Ft*	Building Height:	*1Stories*
Existing Site Elevation – Low:	*51Ft BCB*	Existing Site Elevation – High:	*52Ft BCB*
Proposed Site Elevation – Low:	*51.75Ft BCB*	Proposed Site Elevation – High:	*51.75Ft BCB*
Proposed First Floor Elevation:	*51.75Ft BCB*	Below grade levels:	*0 Stories*

Article 37 Green Building:

LEED Version - Rating System :	NA	LEED Certification:	*No*
Proposed LEED rating:	*Certified/Silver/ Gold/Platinum*	Proposed LEED point score:	*Pts.*

Building Envelope

When reporting R values, differentiate between R discontinuous and R continuous. For example, use "R13" to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

Roof:	*<1(R)*	Exposed Floor:	*<1(R)*
Foundation Wall:	*<1(R)*	Slab Edge (at or below grade):	*<1(R)*

Vertical Above-grade Assemblies (%'s are of total vertical area and together should total 100%):

Area of Opaque Curtain Wall & Spandrel Assembly:	*(%)*	Wall & Spandrel Assembly Value:	*(U)*
Area of Framed & Insulated / Standard Wall:	*85(%)*	Wall Value	*<1(R)*
Area of Vision Window:	*0.2%%*	Window Glazing Assembly Value:	*<1(U)*
		Window Glazing SHGC:	*(SHGC)*
Area of Doors:	*14%*	Door Assembly Value:	*<1(U)*

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	*Building is not heated or cooled. Electricity use consists of on-demand overhead lighting, water heater, hand dryers and exhaust vents, security system and sewer pump..*		
Annual Electric:	*(kWh)*	Peak Electric:	*(kW)*
Annual Heating:	*0(MMbtu/hr)*	Peak Heating:	*0(MMbtu)*
Annual Cooling:	*0(Tons/hr)*	Peak Cooling:	*0(Tons)*
Energy Use - Below ASHRAE 90.1 - 2013:	*%*	Have the local utilities reviewed the building energy performance?:	*no*
Energy Use - Below Mass. Code:	*%*	Energy Use Intensity:	*(kBtu/SF)*

Back-up / Emergency Power System

Electrical Generation Output:	*n/a(kW)*	Number of Power Units:	
System Type:	*(kW)*	Fuel Source:	

Emergency and Critical System Loads (in the event of a service interruption)

Electric:	*(kW)*	Heating:	*(MMbtu/hr)*
		Cooling:	*(Tons/hr)*

B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing GHG emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon neutrality by 2050 new buildings performance will need to progressively improve to net carbon zero and positive.

B.1 – GHG Emissions - Design Conditions

For this Filing - Annual Building GHG Emissions: *NA(Tons)*

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

NA

Describe building specific passive energy efficiency measures including orientation, massing, envelop, and systems:

NA

Describe building specific active energy efficiency measures including equipment, controls, fixtures, and systems:

NA

Describe building specific load reduction strategies including on-site renewable, clean, and energy storage systems:

NA

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

NA

Describe any energy efficiency assistance or support provided or to be provided to the project:

NA

B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

NA

C - Extreme Heat Events

Annual average temperature in Boston increased by about 2˚F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low:	*7Deg.*	Temperature Range - High:	*100Deg.*
Annual Heating Degree Days:	5541	Annual Cooling Degree Days	2897

What Extreme Heat Event characteristics will be / have been used for project planning

Days - Above 90°:	*9*	Days – Above 100°:	*5*
Number of Heatwaves / Year:	*3*	Average Duration of Heatwave (Days):	*3*

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

NA

C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

NA

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

NA

D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25". There is a significant probability that this will increase to at least 6" by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

D.1 – Extreme Precipitation - Design Conditions

10 Year, 24 Hour Design Storm:	*5.25In.*

Describe all building and site measures for reducing storm water run-off:

Runoff from building roof will be collected via roof drains and directed to the infiltration systems. Site areas will be collected via perforated pipes and porous pavement and directed to the infiltration systems.

The infiltration systems will be designed to capture 1.25-inches of runoff from the impervious site areas to meet BWSC requirements. For storms greater than 1.25-inches, overflow pipes will be provided to direct excess runoff to the storm drain mains in the roadways. The infiltration systems are designed to meet or be less than the existing runoff rates and volumes of stormwater for the 2-year, 10-year, 25-year and 100-year storms.

D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

The project is designed to provide the BPDA and BWSC's 1.25-inch storage requirement and will be designed to drain within 72-hours.

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, sea levels in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

Is any portion of the site in a FEMA SFHA?	*No*	What Zone:	NA
		Current FEMA SFHA Zone Base Flood Elevation:	*Ft BCB*

Is any portion of the site in a BPDA Sea Level Rise - Flood Hazard Area? Use the online BPDA SLR-FHA Mapping Tool to assess the susceptibility of the project site.	*No*

If you answered YES to either of the above questions, please complete the following questions.
Otherwise you have completed the questionnaire; thank you!

E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented on the BPDA Sea Level Rise - Flood Hazard Area (SLR-FHA) map, which depicts a modeled 1% annual chance coastal flood event with 40 inches of sea level rise (SLR). Use the online BPDA SLR-FHA Mapping Tool to identify the highest Sea Level Rise - Base Flood Elevation for the site. The Sea Level Rise - Design Flood Elevation is determined by adding either 24" of freeboard for critical facilities and infrastructure and any ground floor residential units OR 12" of freeboard for other buildings and uses.

Sea Level Rise - Base Flood Elevation:	*Ft BCB*		
Sea Level Rise - Design Flood Elevation:	*Ft BCB*	First Floor Elevation:	*Ft BCB*
Site Elevations at Building:	*Ft BCB*	Accessible Route Elevation:	*Ft BCB*

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

Describe any strategies that would support rapid recovery after a weather event:

E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

A pdf and word version of the Climate Resiliency Checklist is provided for informational use and off-line preparation of a project submission. NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

For questions or comments about this checklist or Climate Change best practices, please contact: John.Dalzell@boston.gov

SECTION 2

PROJECT NARRATIVE

PROJECT NARRATIVE CONTENTS

1.0 EXECUTIVE SUMMARY

On behalf of the Applicant, Nitsch Engineering is filing the enclosed Notice of Intent (NOI) with the City of Boston Conservation Commission for construction of a new community field, walkway, restroom building, seating, storage area, and driveway. Other site improvements include installation of new utilities to support the proposed site and construction of new stormwater management systems. The purpose of this NOI Application is to receive an Order of Conditions from the City of Boston Conservation Commission approving the proposed project under the *Wetlands Protection Act* (M.G.L. c. 131, §40), the *Rivers Protection Act* (M.G.L. c. 256, Acts of 1996) and their Regulations (310 CMR 10.00), and the *Wetlands Protection and Climate Adaptation* (City of Boston Municipal Code, Chapter 7-1.4).

The Project site is approximately 181,750 square feet, or 4.172 acres, located at the corner of Morton Street and American Legion Highway at 550 Morton Street in the Mattapan Neighborhood of Boston, Massachusetts. The project site is bounded by American Legion Highway to the northwest, private residences on Osprey Road to the northeast, private residences on Senator Bolling Circle to the southeast, and Morton Street to the southwest.

The project site is undeveloped and contains wooded areas on the north and south sides of the site and along Morton Street. The center of the site contains a grassed field with a mound of soil.

The Project is proposing site grading for a new community field, the construction of a new restroom building, seating, storage, a walkway, and associated utilities. The proposed building will take up ± 508 square feet at the ground floor of the restroom building and the total site impervious area will occupy ± 16,393 square feet.

The site is within the FEMA Zone X: Area of Minimal Flood Hazard. There is a Bordering Vegetated Wetland (BVW) and Isolated Land Subject to Flooding (ILSF) on the northwest side of the site and Canterbury Brook, a perennial stream, approximately 20 feet south of the site on an abutting parcel. Jurisdictional land under waterways, inland bank, riverfront area, and waterfront area are present and associated with Canterbury Brook. Refer to Figures 1 and 3 for a Locus Map showing the site.

The proposed site improvements within jurisdictional Wetland Resource Areas include:

- Sidewalk paving and grading which will disturb 377 square feet within the 25’ Riverfront Area.
- Sidewalk paving, grading, storm drain, and a stone level spreader which will disturb 7,237 square feet within the 25’ Waterfront Area.
- Walking path, utilities, soccer field, and a stone level spreader which will disturb 27,708 square feet within the 100’ Bordering Vegetated Wetland Buffer.

The Project includes several mitigation measures to offset the impacts to the BVW and Canterbury Brook. The proposed stormwater management system will prevent untreated stormwater from being discharged untreated. The stormwater management system has been designed in accordance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. The proposed mitigation measures are further discussed in the Stormwater Report, included as Section 3.

2.0 EXISTING CONDITIONS

2.1 Existing Site Description

The project site is undeveloped and contains wooded areas on the north and south sides of the site and along Morton Street. The center of the site contains a grassed field with a mound of soil.

2.2 Existing Utility Infrastructure

Sanitary Sewer

There are no existing sanitary sewer utilities located on-site. There is an existing 10-inch BWSC sewer main in Osprey Way

Water (Domestic and Fire Protection)

There are no existing water utilities located on the site. There is an existing 8-inch BWSC water main in Osprey Way.

Stormwater Management

The existing site is nearly 100% pervious and currently undeveloped.

Natural Gas

There is no existing natural gas infrastructure located on-site. No gas connections are proposed for this project.

Electrical/Telephone/Cable

There are no existing teldata and electrical conduits on the site. Proposed electrical services will connect to the infrastructure located in Osprey Way.

2.3 Soils

NRCS Soil Designations

The Soil Classification Summary (Table 1) outlines the Natural Resources Conservation Services (NRCS) designation of the soil series at the Site. The soils within the Project Site are classified within two categories (Figure 5).

Table 1. Soil Classification Summary

Soil Unit	Soil Series	Hydrologic Soil Group
345B	Pittstown silt loam, 2 to 8 percent slopes	C
602	Urban land, 0 to 15 percent slopes	---
655	Udorthents, wet substratum	---

On-Site Soil Investigations

Preliminary subsurface explorations were conducted by McPhail Associates, LLC (McPhail) at the site. The investigations consisted of six (6) test pits on May 4, 2021. This investigation showed that site soils were generally fill classified as sandy loam over glacial till yielding infiltration rates ranging from 1.02 to 2.41 inches/hour. The geotechnical engineering memo can be found in Appendix E of the Stormwater Report in Section 3.

2.4 Environmental Considerations

FEMA Flood Zone

Based on the Flood Insurance Rate Map (FIRM), Community Panel Number 25025C0086G, dated 9/25/2009, a portion of the site is located within Zone X (areas of minimal flood hazard). Refer to Figure 4 – FEMA Floodplain Map.

Water Supply Protection Area

The site is not located within a Water Supply Protection Area.

Wetland Resource Areas

There is a Bordering Vegetated Wetland (BVW) and Isolated Land Subject to Flooding (ILSF) on the northwest side of the site and an Perennial Stream approximately 20 feet south of the site on an abutting parcel.

Natural Heritage and Endangered Species Program

A review of the 14th Edition of the Massachusetts Natural Heritage Atlas prepared by the Natural Heritage and Endangered Species Program (NHESP), dated July 8, 2021, indicates that the site is NOT located within a Priority Habitat of Rare Species or an Estimated Habitat of Rare Wildlife (Figure 3).

3.0 PROPOSED CONDITIONS

3.1 Overview of Proposed Work

The project involves the construction of a new community field, walkway, restroom building, seating, storage area, and driveway. Other site improvements include installation of new utilities to support the proposed site and construction of new stormwater management systems.

The proposed project will maintain on-site impervious area (from the original condition), as outlined in Table 2.

Table 2. Proposed land use change for Olmstead Green (in square feet)

Land Use	Existing	Proposed	Change
Building Area	0	517	+517
Site Impervious Area	920	17,072	+16,152
Turf Field	0	72,289	+72,289
Porous Pavement	0	2,201	+2,201
Landscaping	194,927	103,768	-91,159
Total	195,847	195,847	0

3.2 Utilities

All proposed utility connections to the building will connect to infrastructure currently existing in the public rights-of-way within Osprey Way.

Sanitary Sewer

The Project proposes one 4-inch PVC sewer service which will serve the restroom building and connect to a pump chamber outside the building. A grinder pump will be located in the pump chamber which will pump sewage to the existing 10-inch sewer main in Osprey Way through a 1¼-inch sanitary sewer force main.

Water (Domestic and Fire Protection)

The Project proposes a new 1-inch Type “K” copper domestic water service which will connect to the proposed restroom building from the 8-inch southern high water main in Osprey Way.

Stormwater Management

The existing site is nearly 100% pervious and currently undeveloped.

Natural Gas

There is no existing natural gas infrastructure located on-site. No gas connections are proposed for this project.

Electrical/Telephone/Cable

There are no existing teldata and electrical conduits on the site. Proposed electrical services will connect to the infrastructure located in Osprey Way.

3.3 Resilient Building Design & Infrastructure

The Project Site is located in FEMA Zone X: Area of Minimal Flood Hazard and is currently outside of the City of Boston stormwater inundation model. However, the proposed development of the Site as predominately open space will promote resiliency by not impeding or channelizing potential future flood waters. While the proposed project will increase impervious cover, the site will primarily consist of landscaped areas. The post-development stormwater drainage has sufficient capacity to support increased rain events as described in the Stormwater Report in Section 3.

In accordance with Climate Ready Boston, the BPDA's initiative to address climate change, and the Conservation Commission's regulations, the project team integrated resilient concepts into the design of the proposed Project. The design incorporates best practices related to climate preparedness and offers solutions that respond to the impacts of climate related events as described in the Climate Change Resiliency and Preparedness Checklist in Section 1.

3.4 Snow Removal

On the existing site, the site is undeveloped and therefore, snow is not removed from the property. The Site will not be utilized in the winter months and therefore, no snow removal is anticipated for the proposed use of the Site as a community field.

4.0 WETLAND RESOURCE AREA IMPACTS

The impact of the proposed project on wetland resources was limited to the maximum extent practicable. There is a Bordering Vegetated Wetland (BVW) and Isolated Land Subject to Flooding (ILSF) on the northwest side of the site and Canterbury Brook, a perennial stream, approximately 20 feet south of the site on an abutting parcel. Jurisdictional land under waterways, inland bank, riverfront area, and waterfront area are present and associated with Canterbury Brook. In January 2021, an Order of Resource Delineation (ORAD) was issued by the Conservation Commission that approves the delineations described above and can be found in Section 5 Supplemental Information. This order is binding pursuant of 310 CMR 10.00 and the City of Boston Conservation Commission Ordinance for three (3) years from the approval. There is no buffer zone associated with ILSF under 310 CMR 10.02 (2)(b). Table 3 provides a summary of the wetland resource areas impacted by the proposed project.

Table 3. Wetland Resource Area Impacts

Resource Area	Proposed Impact Areas
Bordering Vegetated Wetland 100' Buffer Zone	27,708 SF
Perennial Stream 25-ft Riverfront Area	377 SF
Perennial Stream 25-ft Waterfront Area	7,237 SF
Total	**35,322 SF**

The proposed site improvements within the BVW, Riverfront Area, and Waterfront Area include:

- Sidewalk paving and grading within the 25' Riverfront Area.
- Sidewalk paving, grading, storm drain, and a stone level spreader within the 25' Waterfront Area.
- Walking path, utilities, soccer field, and a stone level spreader within the 100' BVW Buffer.

Erosion and sediment control barriers will be placed along the perimeter of the site to protect the BVW, ILSF, Riverfront Area, and Waterfront Area as indicated on the site plans.

As part of the development of the site, trees will be removed during the construction of this project and additional trees will be planted after construction. Please see Section 5 for more information on the Tree Removal Plan and Planting Plan for the project.

The proposed work is limited to impacts to the wetland resource areas noted in Table 3 and is therefore not subject to any of the City of Boston Wetland Regulation Performance Standards.

5.0 PROPOSED MITIGATION MEASURES

5.1 Construction Period Erosion and Sedimentation Controls

Upon selection of a Contractor, a Construction Management Plan shall be prepared. Construction means and methods include but is not limited to:

- Stockpiling of material will be minimal as material will be ordered as needed; Work will be performed by vehicles with rubber tires; and
- Materials shall be stored outside of the floodplain.

Additional information on construction means and methods will be provided by the Contractor prior to the start of construction.

Erosion and sedimentation controls are proposed to reduce the construction-related impact of the proposed project on adjacent wetland resource areas. Control measures will include, but are not limited to, minimizing land disturbance, providing temporary stabilization and covers, installing perimeter controls (silt fence and straw wattles/bales), constructing temporary sediment basins, and providing stormwater inlet protection (silt sack, straw wattles/bales). The contractor will be required to do inspections of all controls regularly to ensure that the controls are working properly. The contractor shall clean and reinstall any control that needs to be cleaned or replaced. Additionally, the contractor will clean/flush the entire stormwater management system prior to final acceptance by the owner.

The proposed project will disturb more than one acre of land, which requires the filing of a National Pollutant Discharge Elimination System (NPDES) Stormwater Construction General Permit. To apply for coverage under this General Permit, a Notice of Intent will be submitted to the U.S. Environmental Protection Agency prior to the commencement of construction by the Contractor. The NPDES Notice of Intent requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for construction activities, which will be submitted to the Conservation Commission and the DEP prior to construction by the Contractor. The SWPPP is a detailed erosion and sediment control plan that indicates the structural and non-structural erosion and sediment controls that will be employed, as appropriate, to control erosion on the construction site. A draft of the SWPPP will be provided at a later date.

Snow Removal

On the existing site, the site is not utilized during the winter months and therefore, snow is not removed from the property. The Site will continue to not be utilized in the winter months and therefore, no snow removal is anticipated for the proposed use of the Site.

5.2 Post-Construction Stormwater Management

There will be a closed drainage system to collect the runoff from the roof and proposed roadway from the proposed project. The runoff from the roof and site will be collected in an infiltration system, and all runoff eventually discharges to a closed drainage system that will drain to the BWSC drain main in Morton Street. The overall site is designed to improve water quality. For more information on the stormwater management system, refer to the Stormwater Report included in Section 3.

5.3 Long-Term Pollution Prevention

A Long-Term Pollution Prevention Plan has been prepared in compliance with the Standards 4 and 9 of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards, which require provisions for the following:

- Good Housekeeping
- Storing materials and waste products inside or under cover
- Vehicle washing
- Routine inspections of stormwater best management practices
- Spill prevention and response
- Maintenance of lawns, gardens, and other landscaped areas
- Storage and used of fertilizers, herbicides, and pesticides
- Pet waste management
- Operation and management of septic systems
- Proper management of deicing chemicals and snow

The project Owner has reviewed and agreed to implement the management practices outlined in the Plan and proactively conduct operations at Olmstead Green Soccer Field in an environmentally responsible manner.

6.0 INTERESTS OF THE WETLANDS PROTECTION ACT

The Wetlands Protection Act regulates wetland resource areas in order to contribute to the following interests:

- Protection of Public and Private Water Supply
- Protection of Groundwater Supply
- Flood Control
- Storm Damage Prevention
- Prevention of Pollution
- Protection of Land Containing Shellfish
- Protection of Fisheries
- Protection of Wildlife Habitat

By installing stormwater best management practices on the project site, the proposed project will protect the interests of the Wetlands Protection Act, including protection of private/public water supply, protection of groundwater supply, providing flood control, prevention of storm damage, and prevention of pollution.

7.0 CONCLUSION

On behalf of the Applicant, Nitsch Engineering is filing the enclosed Notice of Intent (NOI) Application with the City of Boston Conservation Commission for the construction of the new soccer field at 550 Morton Street, on the corner of Morton Street and American Legion Highway in the Mattapan Neighborhood of Boston, Massachusetts. The proposed project provides numerous mitigation measures including: minimizing the disturbance within resource area boundaries, minimization of earthwork, and improving the stormwater management system to meet the DEP Stormwater Management Standards. This NOI report and associated appendices provide a thorough description of the design details and regulatory compliance in accordance with the pertinent Wetland Statutes and Regulations. The Applicant seeks an Order of Conditions approving the project as proposed.

SECTION 3

Stormwater Report

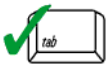
Including the Long-Term Pollution Prevention Plan and Stormwater Operation and Maintenance Plan

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Nitsch Proj.
#14017.1
09/21/2022

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Porous pavement

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☒ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☒ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☐ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

September 21, 2022

STORMWATER REPORT

For

OLMSTED GREEN COMMUNITY FIELD
550 Morton Street,
Boston, MA 02131

Prepared for:

BROOKE CHARTER SCHOOL
190 Cummins Highway
Roslindale, MA 02131

Prepared by:

NITSCH ENGINEERING, INC.
2 Center Plaza, Suite 430
Boston, MA 02143

Nitsch Project #14017

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

Nitsch Engineering has prepared this Stormwater Report to support the Boston Conservation Commission (BCC) Notice of Intent (NOI) application. The project site is located at the corner of Morton Street and American Legion Highway at 550 Morton Street in the Mattapan Neighborhood of Boston, Massachusetts (subsequently referred to as the "Site"). The project site is bounded by American Legion Highway to the northwest, houses on Osprey Road to the northeast, houses on Senator Bolling Circle to the southeast, and Morton Street to the southwest. The project involves the construction of a new community field, walkway, restroom building, seating, storage area, and driveway. Other site improvements include installation of new utilities to support the proposed site and construction of new stormwater management systems.

The proposed stormwater management system has been designed to comply with the requirements of the Boston Water and Sewer Commission (BWSC) and the Massachusetts Department of Environmental Protection (DEP) Stormwater Management Standards.

2.0 EXISTING CONDITIONS

The Site is located at the corner of Morton Street and American Legion Highway at 550 Morton Street in the Mattapan Neighborhood of Boston, Massachusetts. The existing site is undeveloped and contains wooded areas on the north and south sides of the site and along Morton Street. The center of the site contains a grassed field with a mound of soil. There is a Bordering Vegetated Wetland (BVW) and Isolated Land Subject to Flooding (ILSF) on the northwest side of the site. Canterbury Brook, a perennial stream, is located approximately 20 feet south of the site on an abutting parcel.

2.1 Existing Drainage Infrastructure

The existing Site is undeveloped with heavily wooded area in the southern portion of the Site and open grass area in the northern portion of the Site. There is a small mound of soil in the northeastern portion of the Site with slopes of approximately 23% on the north and western portions and 6% on the eastern side. The eastern portion of the site consists of a large hill that ranges from 21-35% slopes and sloping to the west where it flattens into a low point at the center of the site then flowing south towards the Canterbury Brook. The western side of the hill and of the site mostly drains out to the west towards BWSC drains located on the eastern side of Morton Street.

2.2 NRSC Soil Designations

The Soil Classification Summary (Table 1) outlines the Natural Resources Conservation Services (NRCS) designation of the soil series at the Site and the corresponding hydrologic soil groups (HSG). The soils within the Project Site are classified within two categories (refer to the NRCS Soil Maps and Descriptions in Appendix E).

Table 1. Soil Classification Summary

Soil Unit	Soil Series	Hydrologic Soil Group
345B	Pittstown silt loam, 2 to 8 percent slopes	C
602	Urban land, 0 to 15 percent slopes	---
655	Udorthents, wet substratum	---

2.3 On-Site Soil Investigations

Preliminary subsurface explorations were conducted by McPhail Associates, LLC (McPhail) at the site. The investigations consisted of six (6) test pits on May 4, 2021. This investigation showed that site soils were generally fill classified as sandy loam over glacial till yielding infiltration rates ranging from 1.02 to 2.41 inches/hour.

The geotechnical engineering memo can be found in Appendix E.

2.4 Wetland Resource Areas

There are three wetland resource areas per the *Massachusetts Wetlands Protection Act* located within the vicinity of the project. There is a Bordering Vegetated Wetland (BVW) and Isolated Land Subject to Flooding (ILSF) on the northwest side of the site and Canterbury Brook, a perennial stream, approximately 20 feet south of the site on an abutting parcel. There is one local resource area defined in the Boston Wetlands Ordinance in the vicinity of the site, the Waterfront Area, which is associated with the Canterbury Brook.

2.5 Total Maximum Daily Load (TMDL)

The Site ultimately discharges into the lower Charles River and therefore is located within the Charles River watershed and is subject to TMDL for phosphorous the Lower Charles River Basin by MassDEP. The project is also subject to the TMDL for pathogens for the Charles River. The Project has been designed to minimize stormwater discharge and associated phosphorus pollutants through infiltration and porous pavement to meet the 65% load reduction. The Project will also meet the intent of the pathogen TMDL through infiltration and best management practices during the installation of the restrooms and sanitary sewer connection. No illicit discharges or sanitary sewer overflows (SSOs) are anticipated at the Site. Design calculations for the Site can be found in Appendix A.

3.0 PROPOSED CONDITIONS

3.1 Project Description

The project involves the construction of a new artificial turf community field, walkway, restroom building, seating, storage area, and driveway. Other site improvements include installation of new utilities to support the proposed site and construction of new stormwater management systems.

The community field is proposed in the center of the site at elevation 51 Boston City Base (BCB) and will consist of artificial turf. The finished floor elevation of the restroom building east of the community field will be 51.75 BCB. The walkway runs north to south from Osprey Way to Morton Street.

The proposed driveway will consist of porous asphalt, which will result in no increase in impervious area over the driveway.

The Project is classified as a new development and is anticipated to increase the overall impervious area for the Project by approximately 31,220 square feet. Table 2 below indicates the pre- and post-development uses and surface coverage characteristics of the Site.

Table 2. Proposed land use change for Olmstead Green (in square feet)

Land Use	Existing	Proposed	Change
Building Area	0	517	+517
Site Impervious Area	920	17,072	+16,152
Turf Field	0	72,289	+72,289
Porous Pavement	0	2,201	+2,201
Landscaping	194,927	103,768	-91,159
Total	195,847	195,847	0

3.2 Stormwater Management System

The Site will include the installation of a stormwater management system that is designed to meet the MassDEP Stormwater Management Standards. As a new development, the Project is required to provide peak flow and volume mitigation under MassDEP Regulations and provide water quality treatment and groundwater recharge.

The proposed stormwater management system for the Project will include infiltration. Refer to Appendix A for design sheets detailing the treatment via infiltration and porous pavement. The proposed stormwater management system will work to improve stormwater quality leaving the Site, by treating stormwater to remove TSS and phosphorus and reduce peak rates of runoff from the Site. Overflow from the proposed BMPs will be discharged to the to BWSC drain main in Morton Street.

3.3 Stormwater Management During Construction

The Site Contractor will be responsible for stormwater management of the active construction site and is required to adhere to the conditions of the 2017 Construction General Permit under the Environmental Protection Agency through the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). A draft SWPPP will be prepared in accordance with the MassDEP Stormwater Management Standards and the 2022 Construction General Permit and will be provided at a later date.

4.0 STORMWATER MANAGEMENT ANALYSIS

4.1 Methodology

Nitsch Engineering completed a hydrologic analysis of the existing project site utilizing Soil Conservation Service (SCS) Runoff Curve Number (CN) methodology. The SCS method calculates the rate at which the runoff reaches the design point considering several factors: the slope and flow lengths of the subcatchment area, the soil type of the subcatchment area, and the type of surface cover in the subcatchment area. HydroCAD Version 10.00 computer modeling software was used in conjunction with the SCS method to determine the peak runoff rates and runoff volumes for the 2-, 10-, 25-, and 100-year, 24-hour storm events. The proposed project site is being analyzed with the same methodology.

The Site was divided into multiple drainage areas, or subcatchments, which drain to the design points along the property boundary and within the site. For each subcatchment area, SCS Runoff Curve Numbers (CNs) were selected by using the cover type and hydrologic soil group of each area. The peak runoff rates and runoff volumes for the 2-, 10-, 25- and 100-year 24-hour storm events were then determined by inputting the drainage areas, CNs, and time of concentration (T_c) paths into the HydroCAD model.

The National Oceanic and Atmospheric Administration Atlas 14 precipitation frequency estimates were used to calculate the 2-, 10-, 25-, and 100- year 24-hour storm events in HydroCAD. Refer to the HydroCAD calculations in Appendix B and C for rainfall information.

4.2 HydroCAD Version 10.00

The HydroCAD computer program uses SCS and TR-20 methods to model drainage systems. TR-20 (Technical Release 20) was developed by the Soil Conservation Service to estimate runoff and peak discharges in small watersheds. TR-20 is generally accepted by engineers and reviewing authorities as the standard method for estimating runoff and peak discharges.

HydroCAD Version 10.00 uses up to four types of components to analyze the hydrology of a given site: subcatchments, reaches, basins, and links. Subcatchments are areas of land that produce surface runoff. The area, weighted CN, and T_c characterize each individual subcatchment area. Reaches are generally uniform streams, channels, or pipes that convey water from one point to another. A basin is any impoundment that fills with water from one or more sources and empties via an outlet structure. Links are used to introduce hydrographs into a project from another source or to provide a junction for more than one hydrograph within a project. The time span for the model was set for 0-48 hours in order to prevent truncation of the hydrograph.

4.3 Existing Hydrologic Conditions

Nitsch Engineering delineated the project site into three (3) on-site sub catchment (watershed) areas discharging to one (1) design point utilizing an existing conditions survey and on-site observations (See Figure DR-1). Table 4 summarizes the design point, location and area of the watershed. The design point (DP) is defined as the wetland system. The HydroCAD model for existing conditions is provided in Appendix B and results from the HydroCAD calculations are summarized below in Table 3.

Table 3. Existing Drainage Area Summary

Subcatchment	Area (acres)	Description
EX DA #1	1.79	>75% Grass cover
EX DA #2	0.17	>75% Grass cover
EX DA #3	2.54	>75% Grass cover
Total Area	**4.50**	

4.4 Proposed Hydrologic Conditions

The stormwater management system has been designed to mitigate peak runoff conditions in accordance with state and municipal requirements. Table 4 summarizes the DP, location, and area of each subcatchment for proposed conditions for the Project. The existing watershed areas were modified to reflect the proposed topography, storm drainage structures and BMPs, and roof areas. (See Figure DR-2). The HydroCAD model for proposed conditions is provided in Appendix C.

Table 4. Proposed Drainage Area Summary*

Subcatchment	Area (acres)	Description
PR DA #1	1.28	Paved parking and >75% Grass cover
PR DA #2	0.67	Pavement and >75% Grass cover
PR DA #3	2.15	Roofs, pavement and >75% Grass cover
PR DA #4	0.22	Roofs, pavement and >75% Grass cover
PR DA #5	0.18	Pavement and >75% Grass cover
Total Area	**4.50**	

4.5 Peak Flow Rates

The proposed stormwater management system is expected to reduce the proposed peak runoff rates to at or below the existing rates for the 2-, 10-, 25-, and 100-year storm events. Table 5 below summarizes the existing and proposed hydrologic analyses for the site.

Table 5 – Peak Rates of Runoff in Cubic Feet per Second (cfs)

Storm Event	2-year	5-year	10-year	25-year	100-year
Existing	1.89	4.63	7.34	11.45	18.38
Proposed	1.52	2.98	4.34	7.41	15.22

MassDEP regulations state that the peak volume of stormwater runoff leaving the post-development site will not exceed that leaving the pre-development site for the 2-, 10-, 25-, and 100-year storm events. The proposed stormwater management system is expected to reduce or maintain the post-development peak rates of runoff to at or below the pre-development rates. Table 6 below demonstrates essentially equal runoff volumes for the required storm events.

Table 6 –Volumes of Runoff for Total Site (in acre-feet)

Storm Event	2-year	5-year	10-year	25-year	100-year
Existing	0.162	0.335	0.509	0.779	1.25
Proposed	0.115	0.244	0.407	0.675	1.14

5.0 MassDEP Stormwater Management Standards

The Project is considered a ***new development*** under the DEP Stormwater Management System. The Site will be designed to meet and exceed the MassDEP Stormwater Management Standards as summarized below:

Standard 1: No New Untreated Discharges

The Project will not discharge any untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. Stormwater from the Site will be collected and treated in accordance with the MassDEP Stormwater Management Standards and stormwater outfalls will be stabilized to prevent erosion.

Standard 2: Peak Rate Attenuation

The proposed stormwater management system will be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates. To prevent storm damage and downstream flooding, the proposed stormwater management practices will mitigate peak runoff rates for the 2-, 10-, 25- and 100-year, 24-hour storm events. Refer to Table 5 for an existing and proposed runoff rate comparison.

Standard 3: Groundwater Recharge

Most of the Site is expected to be able to support groundwater recharge due to infiltration rates discovered during site investigations. Infiltration is provided through a recharge system under the community field and porous pavement in the driveway.

Standard 4: Water Quality Treatment

The proposed stormwater management system will be designed to remove greater than 80% of the average annual post-construction load of Total Suspended Solids (TSS). The TMDL in the Lower Charles River requires a minimum of 65% phosphorus reduction and Fecal Coliform bacterial shall not exceed a geometric mean of 200 organisms per 100 mL in any representative set of samples, nor shall more than 10 percent of the samples exceed 400 organisms per 100mL. Structural stormwater BMPs include infiltration and porous pavement to remove any pathogens, a minimum of 80% Total Suspended Solids, and 65% Phosphorus from the 1.25” rainfall depth over the site. Infiltration calculation spreadsheets are provided in Appendix A.

Source control and pollution prevention measures, such as vacuum cleaning, street sweeping, proper snow management, and stabilization of eroded surfaces, are included in the Long-Term Pollution Prevention Plan and Operation and Maintenance Plan (Appendix D).

Standard 5: Land Uses with Higher Potential Pollutant Loads Refer to Standard 5 for LUHPPL Thresholds

The project is not considered a LUHPPL and therefore, this standard is not applicable.

Standard 6: Critical Areas

The Project is not located within any critical areas. Therefore, this standard is not applicable.

Standard 7: Redevelopments

The Project is not considered a redevelopment under the MassDEP Stormwater Management Standards. Therefore, this standard is not applicable.

Standard 8: Construction Period Pollution Prevention and Sedimentation Control

A plan to control construction-related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) will be developed and implemented during the Notice of Intent permitting process.

Because the Project will disturb more than one (1) acre of land, a Notice of Intent will be submitted to the Environmental Protection Agency (EPA) for coverage under the National Pollution Discharge Elimination System (NPDES) Construction General Permit. As part of this application the Applicant is required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and implement the measures in the SWPPP. The SWPPP, which is to be kept on site, includes erosion and sediment controls (stabilization practices and structural practices), temporary and permanent stormwater management measures, Contractor inspection schedules and reporting of all SWPPP features, materials management, waste disposal, off-site vehicle tracking, spill prevention and response, sanitation, and non-stormwater discharges. A draft SWPPP will be provided at a later date.

Standard 9: Operation and Maintenance Plan

A post-construction operation and maintenance plan has been prepared and will be implemented to ensure that stormwater management systems function as designed. Source control and stormwater BMP operation requirements for the site are summarized in the Long-Term Pollution Prevention Plan and Operation and Maintenance Plan provided in Appendix D.

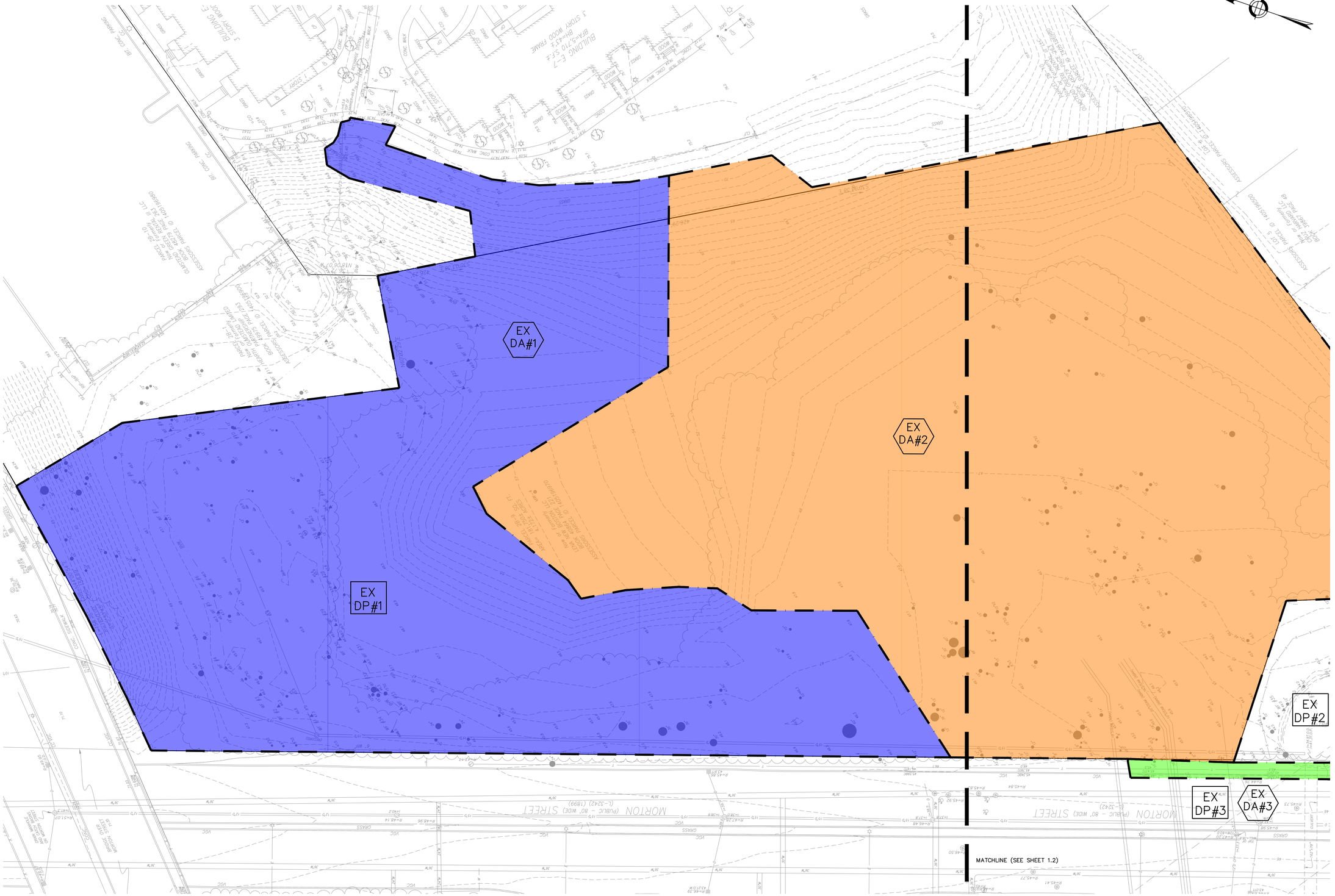
Standard 10: Prohibition of Illicit Discharges

There will be no illicit discharges to the stormwater management system associated with the Project. An Illicit Discharge Compliance Statement is provided in Appendix A.

6.0 CONCLUSION

In conclusion, the Project's stormwater management system will reduce or maintain peak runoff rates and volumes through infiltration and porous pavement to improve the water quality of stormwater being discharged from the Site. Environmentally sensitive site design and low impact development techniques will be implemented throughout the Site. The Project is being designed to meet and exceed the MassDEP Stormwater Management Standards and the City of Boston Rules and Regulations.

FIGURES



LEGEND

- SUBCATCHMENT AREA
- EX — SUBCATCHMENT AREA LABEL
- DP — DESIGN POINT

SCALE:
1" = 20'
20 10 0 20 40
Source: NITSCH ENGINEERING

WARNER LARSON
LANDSCAPE ARCHITECTS
130 WEST BROADWAY, BOSTON MA 02127
617.464.1440 warnerlarson.com

Nitsch Engineering
www.nitschengr.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472
• Civil Engineering
• Land Surveying
• Transportation Engineering
• Traffic Engineering
• Water Infrastructure
• Planning
• GIS

BROOKE CHARTER HIGH SCHOOL: MATTAPAN COMMUNITY FIELD

BOSTON, MASSACHUSETTS

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	DESCRIPTION

DATE: 07-21-2022
SCALE: 1"=20'
JOB #: BROOKE CHARTER HS
DRAWN BY: AAC

EXISTING DRAINAGE AREAS

FIG. 1.1

NITSCH #14017

EX DP#2

EX DP#3

EX DA#3

MATCHLINE (SEE SHEET 1.1)

LEGEND

SUBCATCHMENT AREA

EX — SUBCATCHMENT AREA LABEL

DP — DESIGN POINT

SCALE: 1" = 20'

20 10 0 20 40

Source: NITSCH ENGINEERING

WARNER LARSON
LANDSCAPE ARCHITECTS
130 WEST BROADWAY, BOSTON MA 02127
617.464.1440 warnerlarson.com

Nitsch Engineering
www.nitschengr.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472
Civil Engineering
Land Surveying
Transportation Engineering
Traffic Engineering
Water Infrastructure
Planning
GIS

BROOKE CHARTER HIGH SCHOOL: MATTAPAN COMMUNITY FIELD

BOSTON, MASSACHUSETTS

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	DESCRIPTION

DATE: 07-21-2022

SCALE: 1"=20'

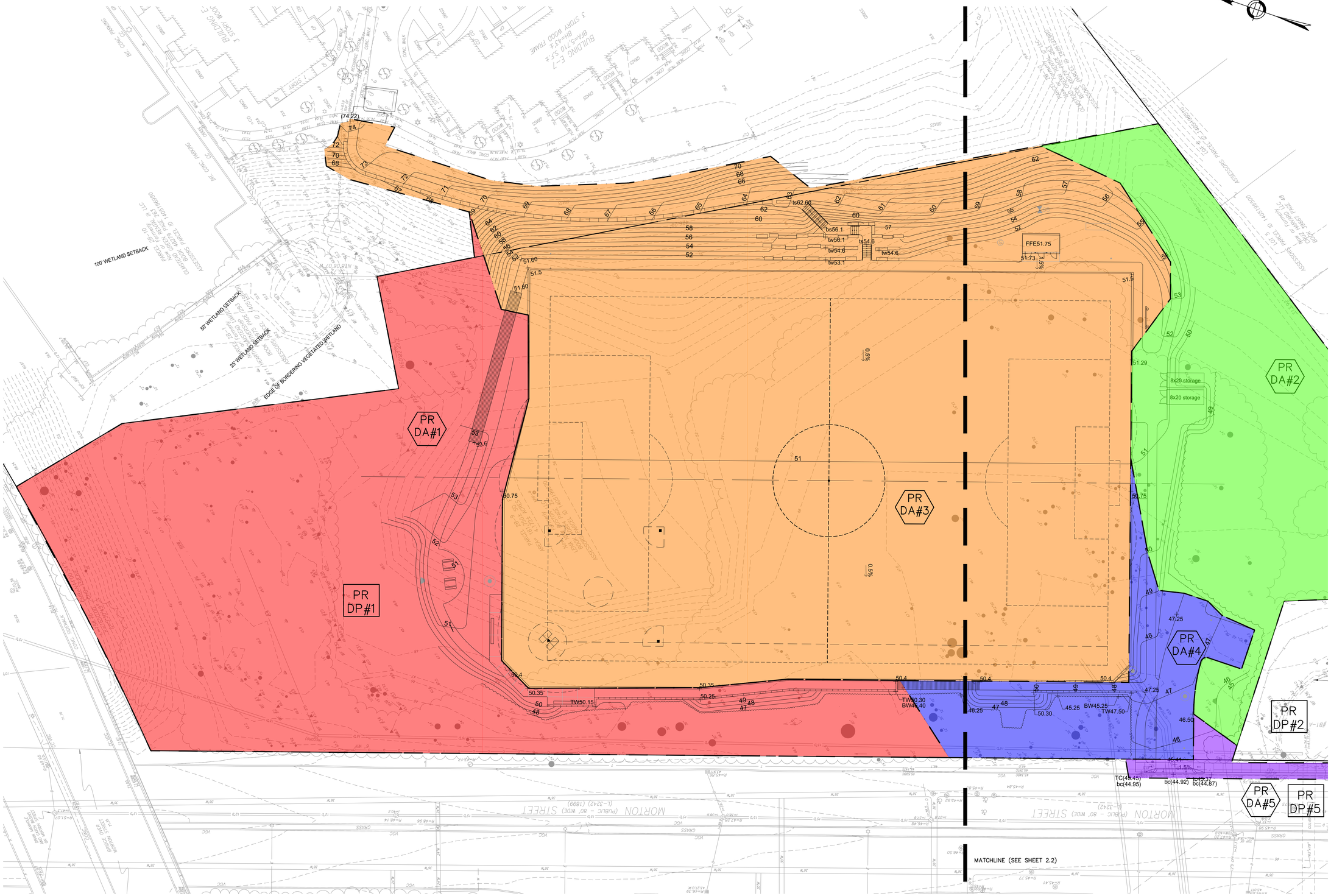
JOB #: BROOKE CHARTER HS

DRAWN BY: AAC

EXISTING DRAINAGE AREAS

FIG. 1.2

NITSCH #14017



LEGEND

- SUBCATCHMENT AREA
- EX — SUBCATCHMENT AREA LABEL
- DP — DESIGN POINT

SCALE: 1" = 20'

20 10 0 20 40

Source: NITSCH ENGINEERING

WARNER LARSON
LANDSCAPE ARCHITECTS
130 WEST BROADWAY, BOSTON MA 02127
617.464.1440 warnerlarson.com

Nitsch Engineering
www.nitschengr.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472
• Civil Engineering
• Land Surveying
• Transportation Engineering
• Traffic Engineering
• Water Infrastructure
• Planning
• GIS

BROOKE CHARTER HIGH SCHOOL: MATTAPAN COMMUNITY FIELD

BOSTON, MASSACHUSETTS

NOT FOR CONSTRUCTION

REVISIONS

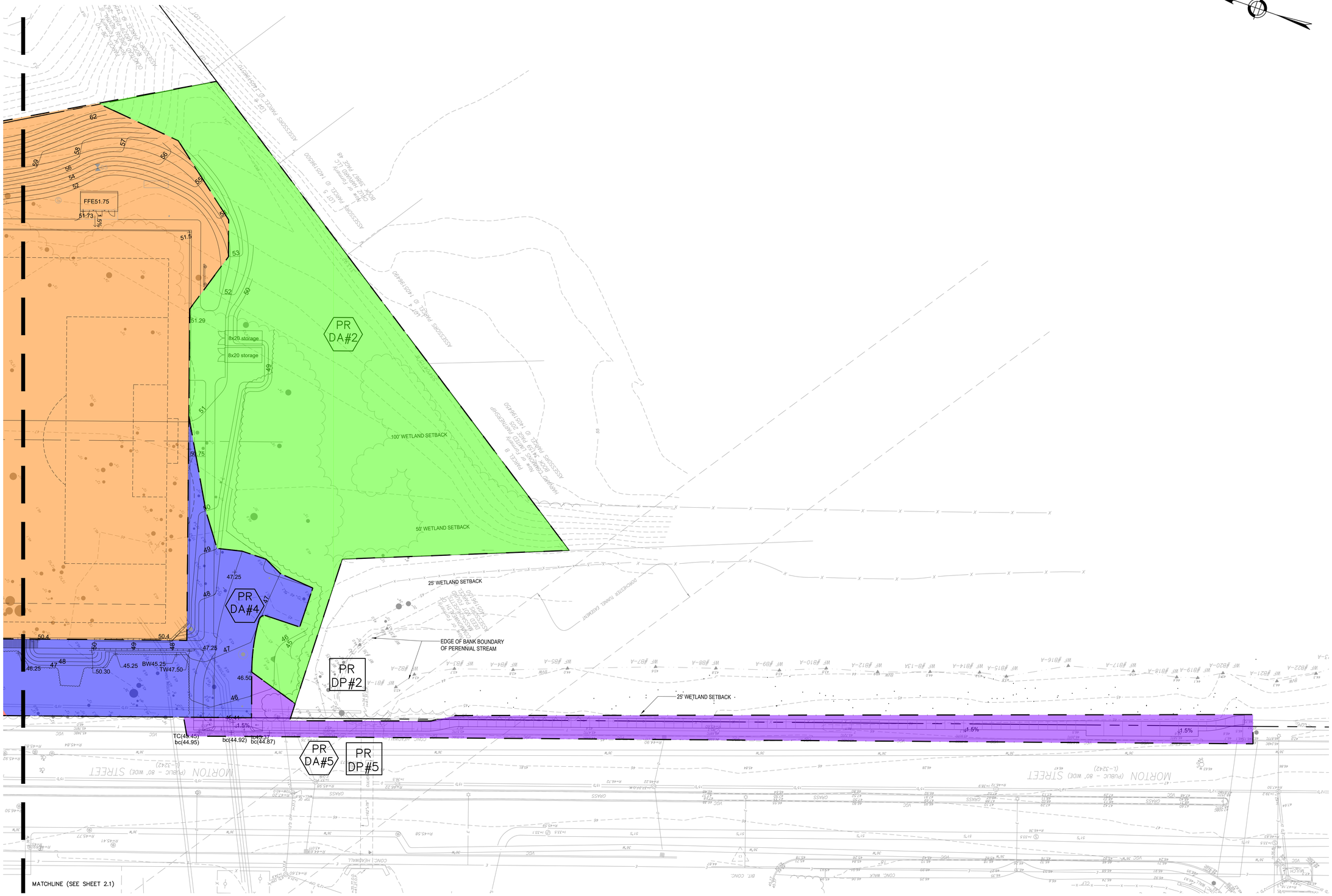
NO.	DATE	DESCRIPTION

DATE: 07-21-2022
SCALE: 1"=20'
JOB #: BROOKE CHARTER HS
DRAWN BY: AAC

PROPOSED DRAINAGE AREAS

FIG. 2.1

NITSCH #14017



LEGEND

- SUBCATCHMENT AREA
- EX — SUBCATCHMENT AREA LABEL
- DP — DESIGN POINT

SCALE: 1" = 20'

20 10 0 20 40

Source: NITSCH ENGINEERING

WARNER LARSON
LANDSCAPE ARCHITECTS
130 WEST BROADWAY, BOSTON MA 02127
617.464.1440 warnerlarson.com

Nitsch Engineering
www.nitschengr.com
2 Center Plaza, Suite 430
Boston, MA 02108
T: (617) 338-0063
F: (617) 338-6472
Civil Engineering
Land Surveying
Transportation Engineering
Traffic Engineering
Site/Infrastructure Planning
GIS

BROOKE CHARTER HIGH SCHOOL: MATTAPAN COMMUNITY FIELD

BOSTON, MASSACHUSETTS

NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	DESCRIPTION

DATE: 07-21-2022
SCALE: 1"=20'
JOB #: BROOKE CHARTER HS
DRAWN BY: AAC

PROPOSED DRAINAGE AREAS

FIG. 2.2

NITSCH #14017

APPENDIX A

Stormwater Management Standards Documentation

Standard 4: TSS Removal Spreadsheet
Phosphorus Removal Spreadsheet

Standard 10: Illicit Discharge Compliance Statement

Olmsted Green Community Field
WATER QUALITY TREATMENT SUMMARY

Nitsch Engineering has prepared this Water Quality Treatment Summary for the proposed Olmsted Green Community Field project for the City of Boston Conservation Commission Notice of intent application. In compliance with City of Boston requirements and MassDEP Stormwater Management Standard #4, the proposed stormwater management system is designed to remove at least 80% of the average annual post-construction load of Total Suspended Solids (TSS).

A summary of treatment trains proposed to provide water quantity control and water quality improvement at the proposed project site is provided below.

Treatment Train A
Subsurface Infiltration→ DP Wetland

Treatment Train B
Porous Pavement→ Subsurface Infiltration ->DP Wetland

Treatment Train A
Subsurface Infiltration → DP Wetland

Treatment Spreadsheet

B	C	D	E	F
BMP	TSS Removal Rate[1]	Starting TSS Load	Amount Removed (C*D)	Remaining Load (D-E)
Subsurface Infiltration	**0.80**	**1.00**	**0.80**	**0.20**

Total TSS Removal = **80%** **Meets 80% TSS removal requirement**

Treatment Train B
Porous Pavement → Subsurface Infiltration → DP Wetland

Treatment Spreadsheet

B BMP	C TSS Removal Rate	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Permeable Pavers/Porous Pavement	**0.80**	**1.00**	**0.80**	**0.20**
Subsurface Infiltration	**0.80**	**0.20**	**0.16**	**0.04**
		Total TSS Removal =	**96%**	**Meets 80% TSS removal requirement**

PHOSPHORUS REMOVAL CALCULATIONS
Olmsted Green

Land Conversion

	Proposed		
	Area ac	Export Rate lbs/acre/yr	Phosphorus Load lbs P/yr
Impervious - Pavement	0.30	1.78	0.54
Impervious - Roof*	0.01	1.1	0.01
Pervious	2.56	0.27	0.69
Total	2.88		1.24
Phosphorus reduction required (65% of Phosphorus Load)			**0.81**

*Export rate using average value from compiled research data

Structural Stormwater Strategies

	Surface Type	Treated Area (ac)	P Load Rate (lbs/ac/yr)	Starting P Load (lbs/yr)	P Removal (%)	P Removed (lbs/yr)
Infiltration	Roof	0.01	1.1	0.011		0.010
	Pavement	0.19	1.78	0.338	93%	0.31
	Landscape	2.0	0.27	0.551		0.512
				0.90		**0.84**

Total Phosphorus Removed	**0.84**
	0.84 > 0.81

Nitsch Engineering

2 Center Plaza, Suite 430
Boston, MA 02108-1928
T: 617-338-0063
F: 617-338-6472
www.nitscheng.com

STANDARD 10: Illicit Discharge Compliance Statement

Project Name: Olmsted Green Community Field	Nitsch Project #: 14017
Location: 550 Morton Street, Boston, MA 02131	Checked by:
Prepared by: Nitsch Engineering	Sheet No. 1 of 1
Date: 09/21/2022	

Standard 10 states: All illicit discharges to the stormwater management system are prohibited.

This is to verify:

1. Based on the information available there are no known or suspected illicit discharges to the stormwater management system at 550 Morton Street site as defined in the MassDEP Stormwater Handbook.

2. The design of the stormwater system includes no proposed illicit discharges.

NAME, PE

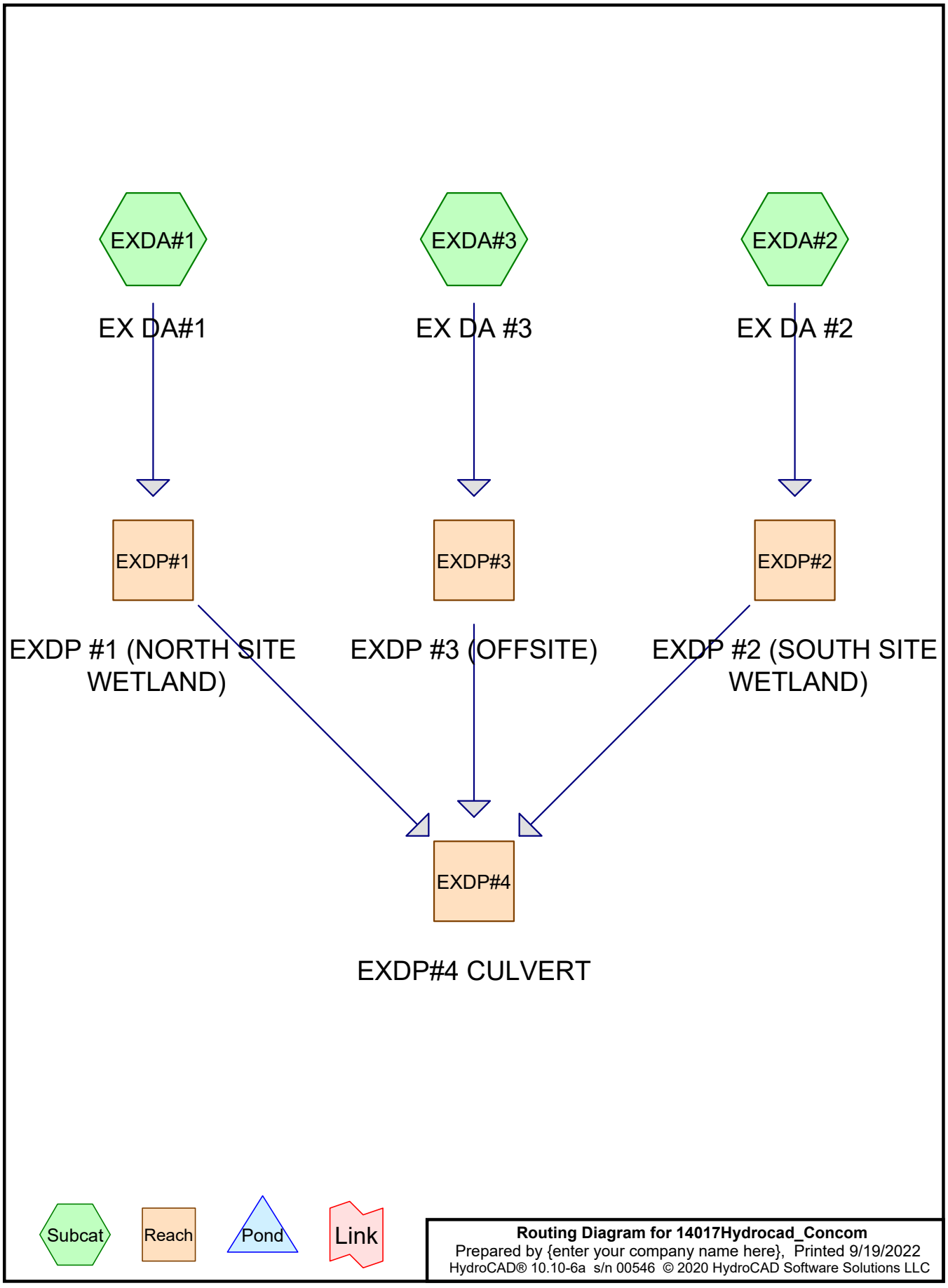
JOHN M SCHMID PE

9/21/22

Date

APPENDIX B

Pre-Development Conditions – HydroCAD Calculations



Routing Diagram for 14017Hydrocad_Concom
Prepared by {enter your company name here}, Printed 9/19/2022

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	NOAA 24-hr	D	Default	24.00	1	3.33	2
2	5 year	NOAA 24-hr	D	Default	24.00	1	4.37	2
3	10 year	NOAA 24-hr	D	Default	24.00	1	5.24	2
4	25 year	NOAA 24-hr	D	Default	24.00	1	6.43	2
5	100 year	NOAA 24-hr	D	Default	24.00	1	8.26	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
194,927	61	>75% Grass cover, Good, HSG B (EXDA#1, EXDA#2, EXDA#3)
920	98	Paved parking, HSG B (EXDA#3)
195,847	**61**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
195,847	HSG B	EXDA#1, EXDA#2, EXDA#3
0	HSG C	
0	HSG D	
0	Other	
195,847		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	194,927	0	0	0	194,927	>75% Grass cover, Good	
0	920	0	0	0	920	Paved parking	
0	**195,847**	**0**	**0**	**0**	**195,847**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EXDA#1: EX DA#1 Runoff Area=78,065 sf 0.00% Impervious Runoff Depth>0.42"
Tc=6.0 min CN=61 Runoff=0.76 cfs 2,761 cf

Subcatchment EXDA#2: EX DA #2 Runoff Area=110,563 sf 0.00% Impervious Runoff Depth>0.42"
Tc=6.0 min CN=61 Runoff=1.07 cfs 3,911 cf

Subcatchment EXDA#3: EX DA #3 Runoff Area=7,219 sf 12.74% Impervious Runoff Depth>0.62"
Tc=0.0 min CN=66 Runoff=0.14 cfs 374 cf

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND) Inflow=0.76 cfs 2,761 cf
Outflow=0.76 cfs 2,761 cf

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND) Inflow=1.07 cfs 3,911 cf
Outflow=1.07 cfs 3,911 cf

Reach EXDP#3: EXDP #3 (OFFSITE) Inflow=0.14 cfs 374 cf
Outflow=0.14 cfs 374 cf

Reach EXDP#4: EXDP#4 CULVERT Inflow=1.89 cfs 7,045 cf
Outflow=1.89 cfs 7,045 cf

Total Runoff Area = 195,847 sf Runoff Volume = 7,045 cf Average Runoff Depth = 0.43"
99.53% Pervious = 194,927 sf 0.47% Impervious = 920 sf

Summary for Subcatchment EXDA#1: EX DA#1

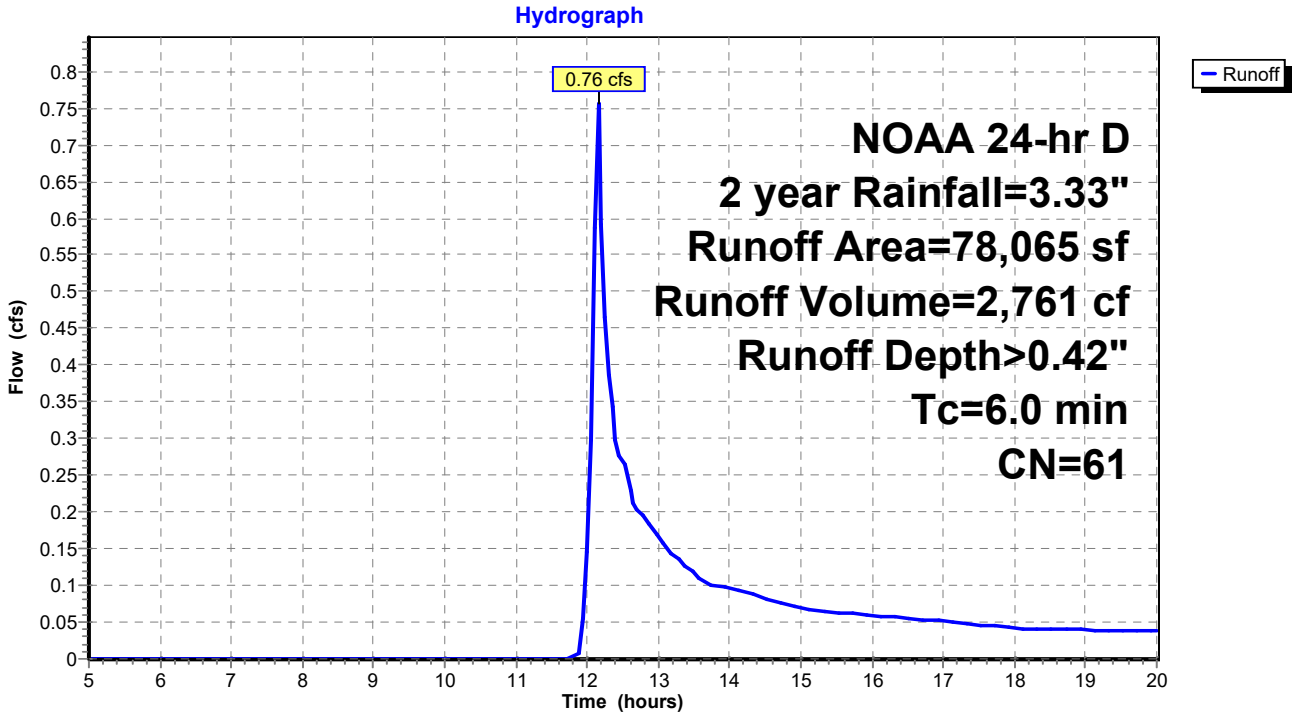
Runoff = 0.76 cfs @ 12.15 hrs, Volume= 2,761 cf, Depth> 0.42"
Routed to Reach EXDP#1 : EXDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Description
78,065	61	>75% Grass cover, Good, HSG B
78,065		100.00% Pervious Area

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

Subcatchment EXDA#1: EX DA#1



Summary for Subcatchment EXDA#2: EX DA #2

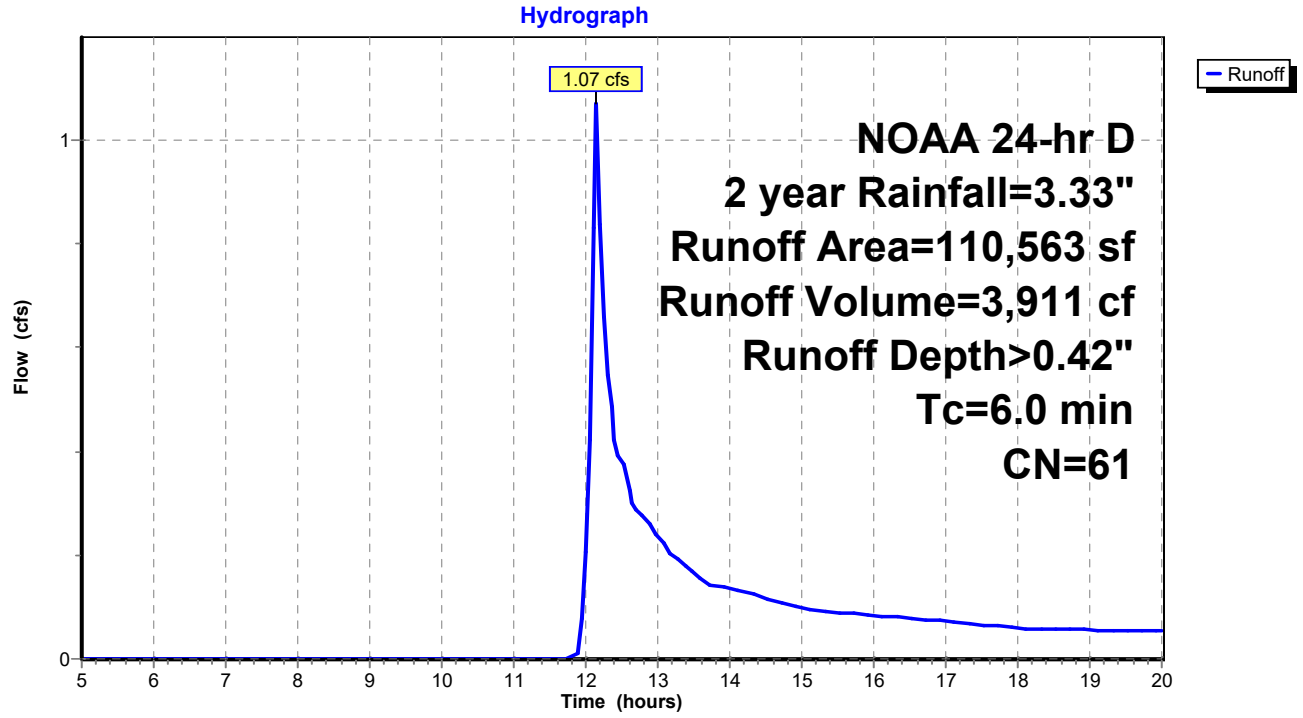
Runoff = 1.07 cfs @ 12.15 hrs, Volume= 3,911 cf, Depth> 0.42"
Routed to Reach EXDP#2 : EXDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Description
110,563	61	>75% Grass cover, Good, HSG B
110,563		100.00% Pervious Area

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

Subcatchment EXDA#2: EX DA #2



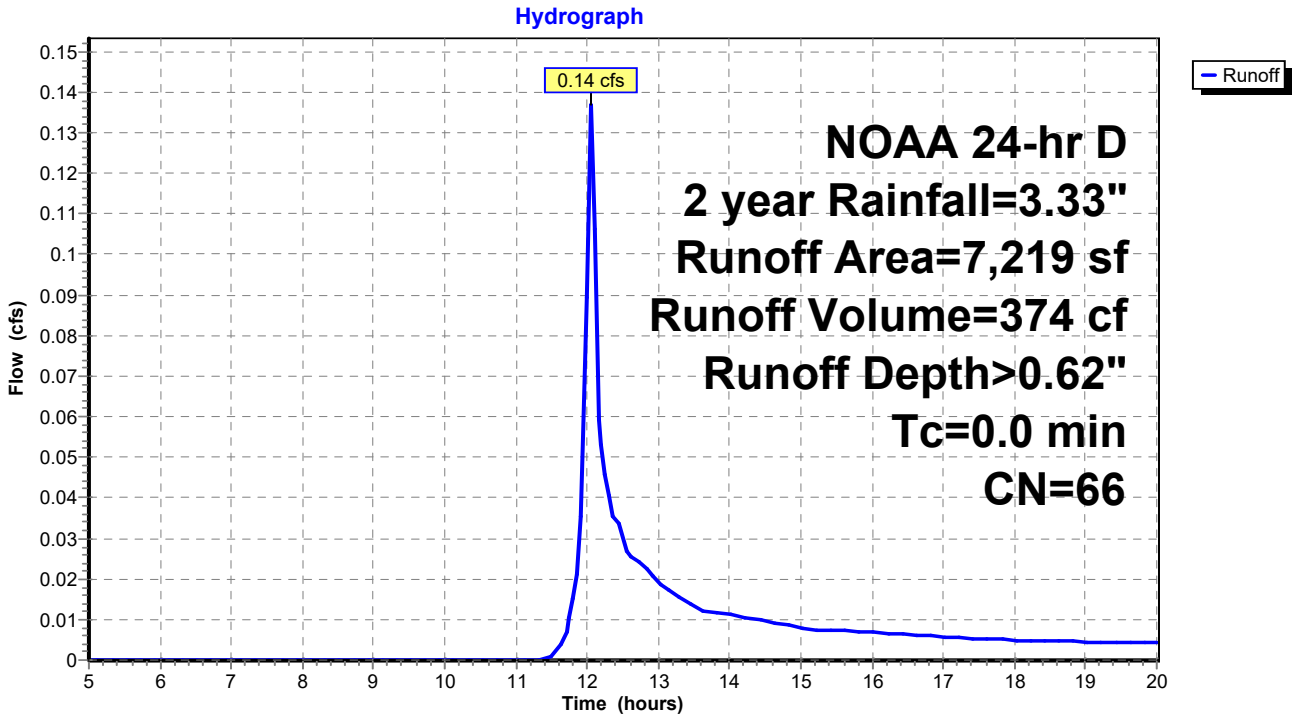
Summary for Subcatchment EXDA#3: EX DA #3

Runoff = 0.14 cfs @ 12.06 hrs, Volume= 374 cf, Depth> 0.62"
Routed to Reach EXDP#3 : EXDP #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Description
6,299	61	>75% Grass cover, Good, HSG B
920	98	Paved parking, HSG B
7,219	66	Weighted Average
6,299		87.26% Pervious Area
920		12.74% Impervious Area

Subcatchment EXDA#3: EX DA #3

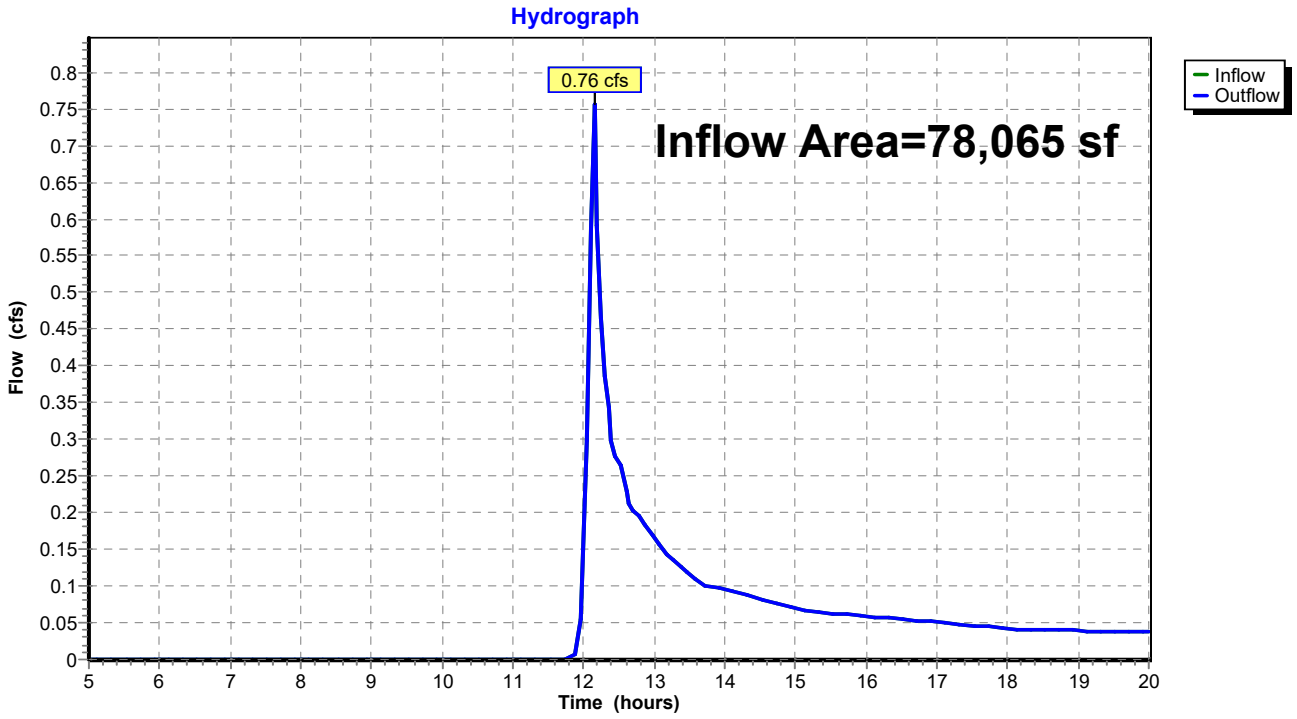


Summary for Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

Inflow Area = 78,065 sf, 0.00% Impervious, Inflow Depth > 0.42" for 2 year event
Inflow = 0.76 cfs @ 12.15 hrs, Volume= 2,761 cf
Outflow = 0.76 cfs @ 12.15 hrs, Volume= 2,761 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

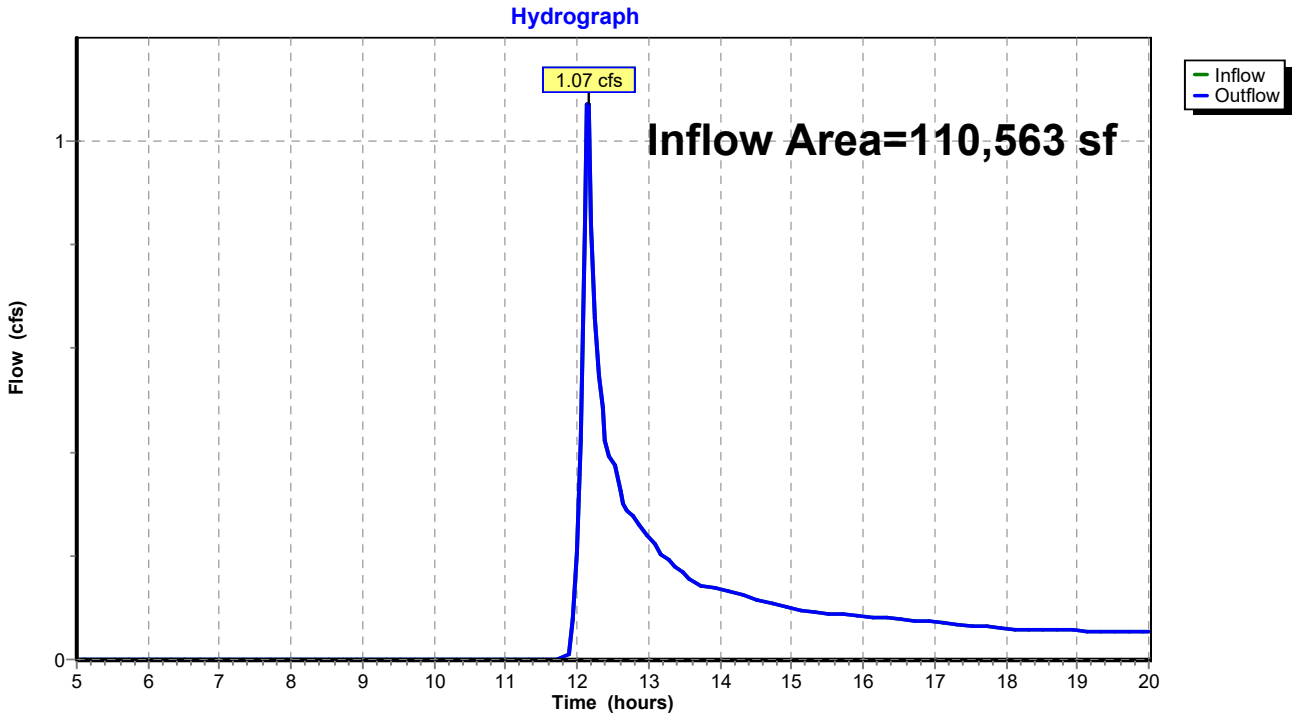


Summary for Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

Inflow Area = 110,563 sf, 0.00% Impervious, Inflow Depth > 0.42" for 2 year event
Inflow = 1.07 cfs @ 12.15 hrs, Volume= 3,911 cf
Outflow = 1.07 cfs @ 12.15 hrs, Volume= 3,911 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

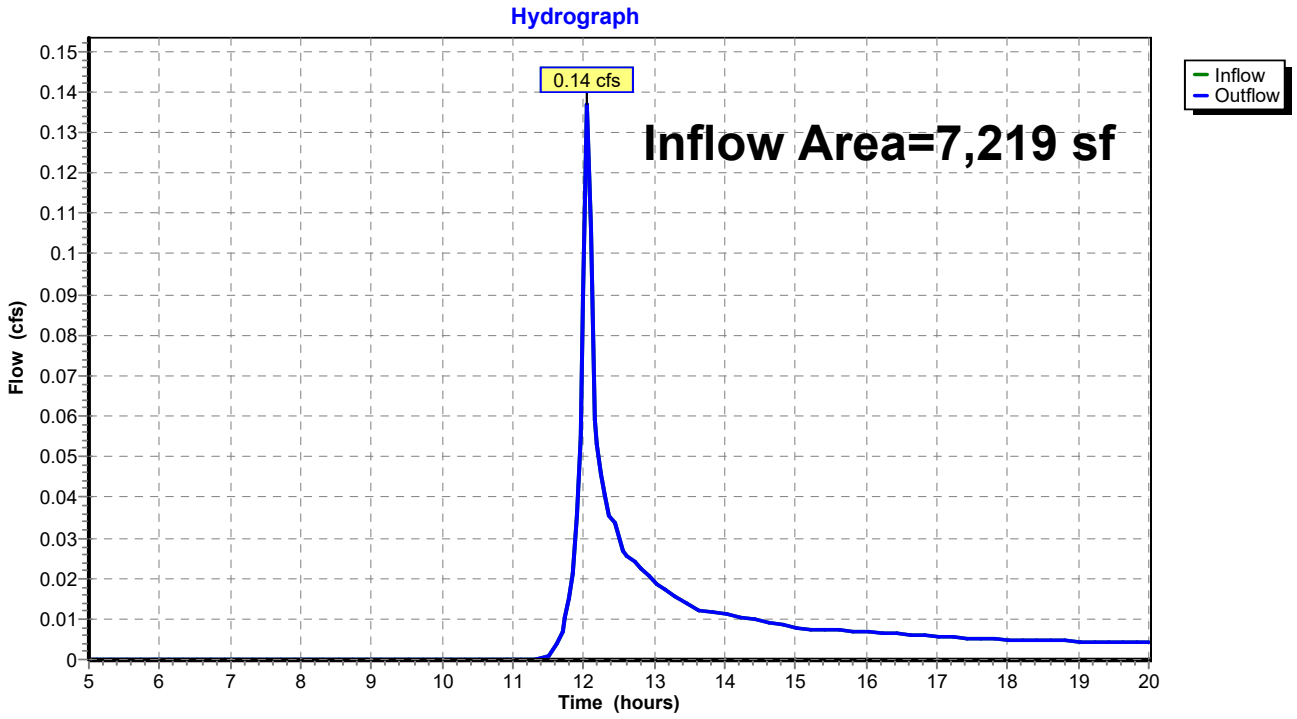


Summary for Reach EXDP#3: EXDP #3 (OFFSITE)

Inflow Area = 7,219 sf, 12.74% Impervious, Inflow Depth > 0.62" for 2 year event
Inflow = 0.14 cfs @ 12.06 hrs, Volume= 374 cf
Outflow = 0.14 cfs @ 12.06 hrs, Volume= 374 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#3: EXDP #3 (OFFSITE)

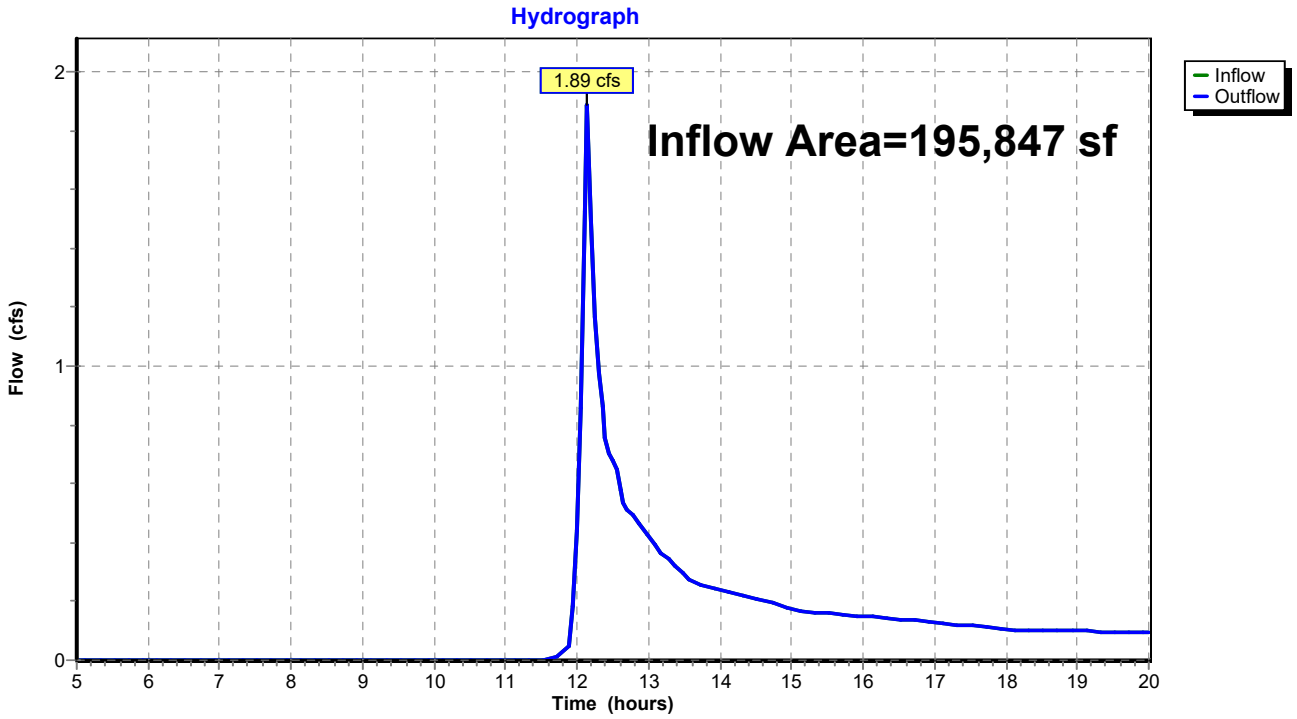


Summary for Reach EXDP#4: EXDP#4 CULVERT

Inflow Area = 195,847 sf, 0.47% Impervious, Inflow Depth > 0.43" for 2 year event
Inflow = 1.89 cfs @ 12.15 hrs, Volume= 7,045 cf
Outflow = 1.89 cfs @ 12.15 hrs, Volume= 7,045 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#4: EXDP#4 CULVERT



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEXDA#1: EX DA#1 Runoff Area=78,065 sf 0.00% Impervious Runoff Depth>0.88"
Tc=6.0 min CN=61 Runoff=1.87 cfs 5,742 cf

SubcatchmentEXDA#2: EX DA #2 Runoff Area=110,563 sf 0.00% Impervious Runoff Depth>0.88"
Tc=6.0 min CN=61 Runoff=2.64 cfs 8,132 cf

SubcatchmentEXDA#3: EX DA #3 Runoff Area=7,219 sf 12.74% Impervious Runoff Depth>1.17"
Tc=0.0 min CN=66 Runoff=0.27 cfs 705 cf

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND) Inflow=1.87 cfs 5,742 cf
Outflow=1.87 cfs 5,742 cf

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND) Inflow=2.64 cfs 8,132 cf
Outflow=2.64 cfs 8,132 cf

Reach EXDP#3: EXDP #3 (OFFSITE) Inflow=0.27 cfs 705 cf
Outflow=0.27 cfs 705 cf

Reach EXDP#4: EXDP#4 CULVERT Inflow=4.63 cfs 14,579 cf
Outflow=4.63 cfs 14,579 cf

Total Runoff Area = 195,847 sf Runoff Volume = 14,579 cf Average Runoff Depth = 0.89"
99.53% Pervious = 194,927 sf 0.47% Impervious = 920 sf

Summary for Subcatchment EXDA#1: EX DA#1

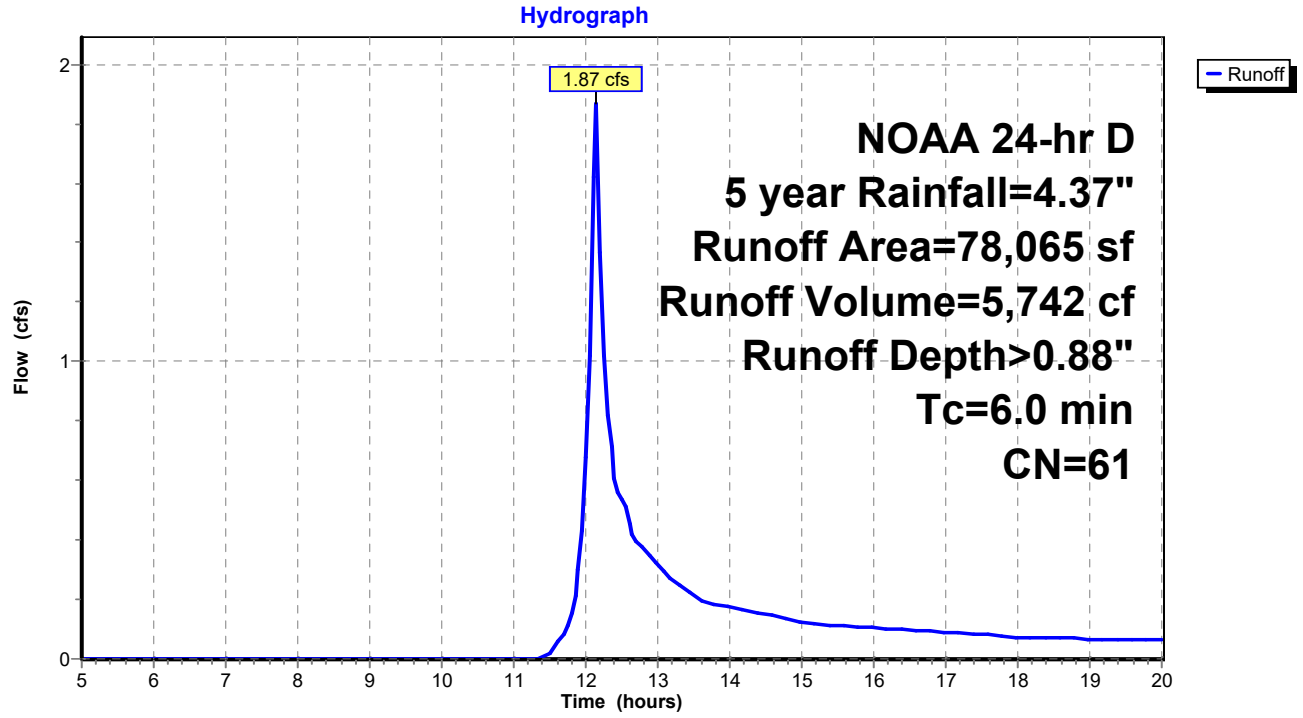
Runoff = 1.87 cfs @ 12.14 hrs, Volume= 5,742 cf, Depth> 0.88"
Routed to Reach EXDP#1 : EXDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Description
78,065	61	>75% Grass cover, Good, HSG B
78,065		100.00% Pervious Area

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

Subcatchment EXDA#1: EX DA#1



Summary for Subcatchment EXDA#2: EX DA #2

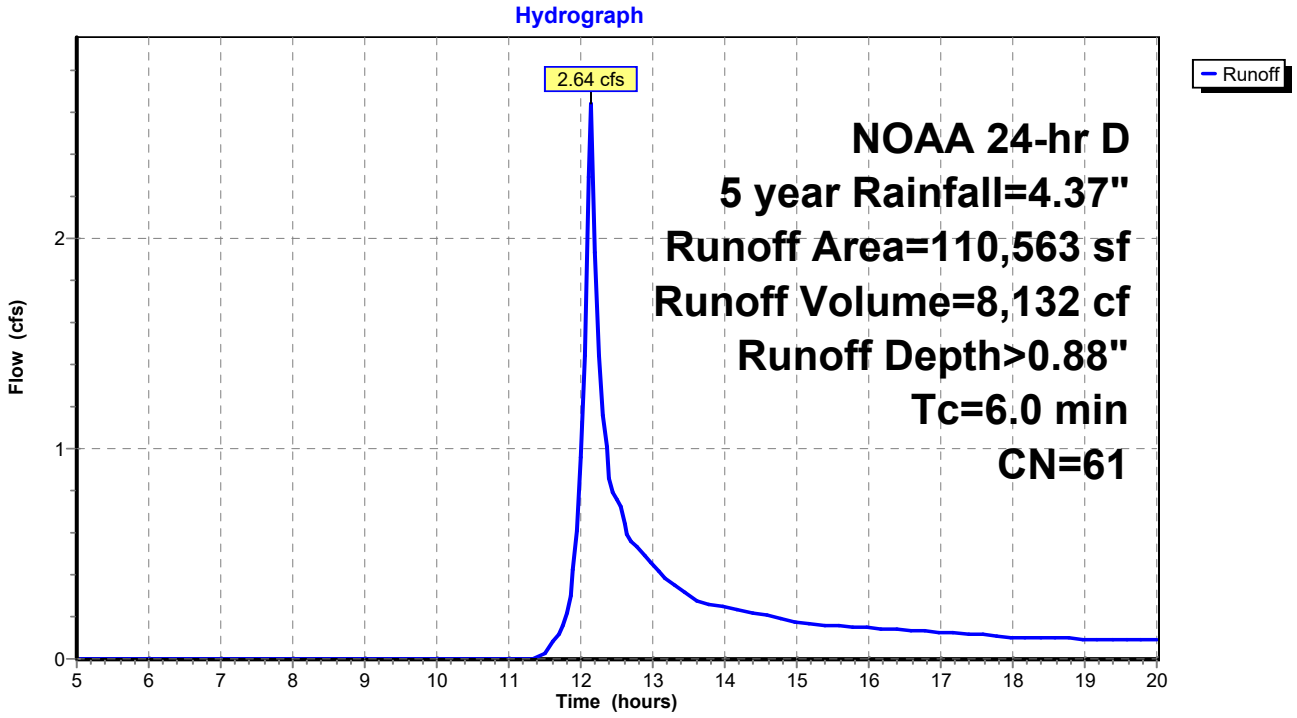
Runoff = 2.64 cfs @ 12.14 hrs, Volume= 8,132 cf, Depth> 0.88"
Routed to Reach EXDP#2 : EXDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Description
110,563	61	>75% Grass cover, Good, HSG B
110,563		100.00% Pervious Area

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

Subcatchment EXDA#2: EX DA #2



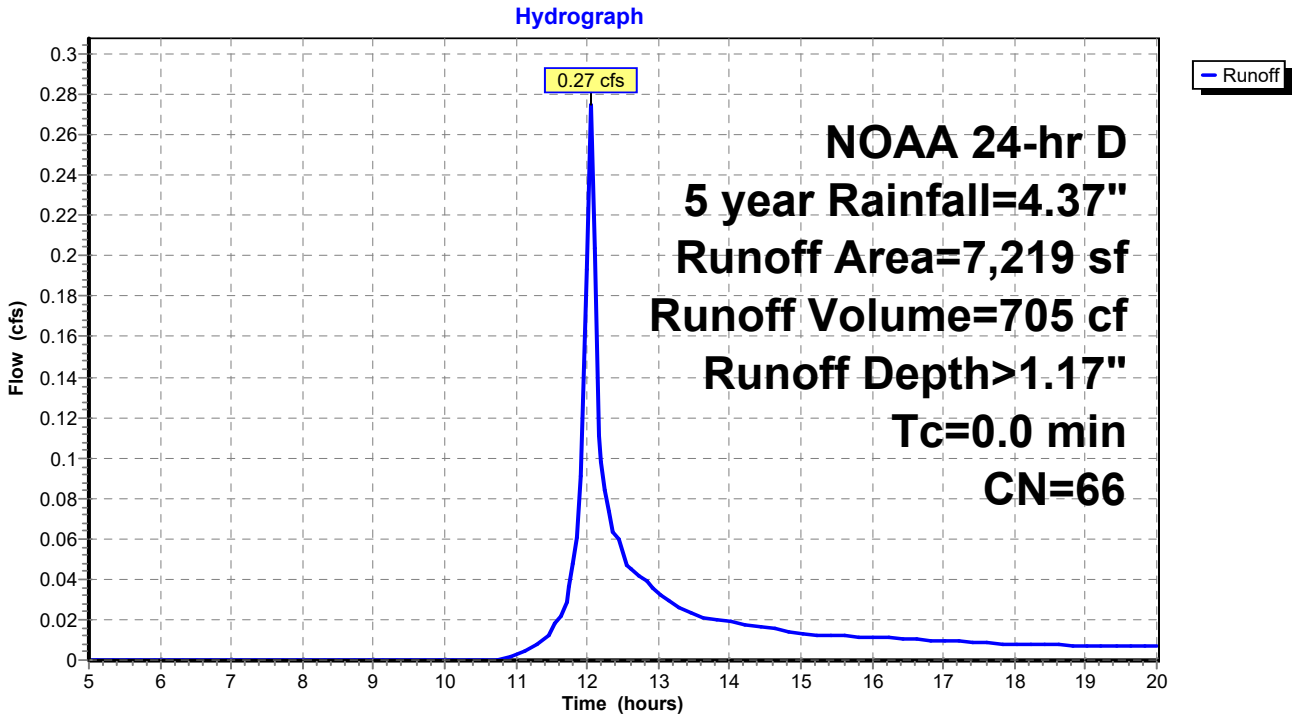
Summary for Subcatchment EXDA#3: EX DA #3

Runoff = 0.27 cfs @ 12.05 hrs, Volume= 705 cf, Depth> 1.17"
Routed to Reach EXDP#3 : EXDP #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Description
6,299	61	>75% Grass cover, Good, HSG B
920	98	Paved parking, HSG B
7,219	66	Weighted Average
6,299		87.26% Pervious Area
920		12.74% Impervious Area

Subcatchment EXDA#3: EX DA #3

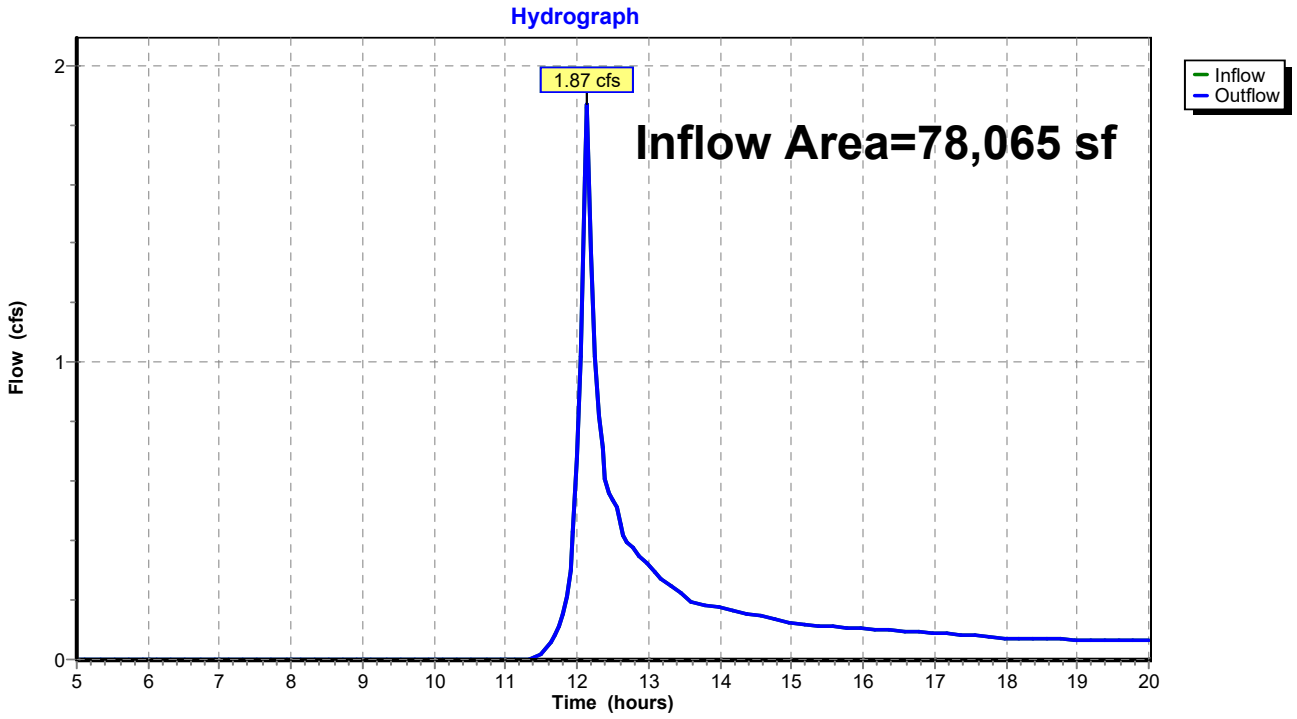


Summary for Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

Inflow Area = 78,065 sf, 0.00% Impervious, Inflow Depth > 0.88" for 5 year event
Inflow = 1.87 cfs @ 12.14 hrs, Volume= 5,742 cf
Outflow = 1.87 cfs @ 12.14 hrs, Volume= 5,742 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

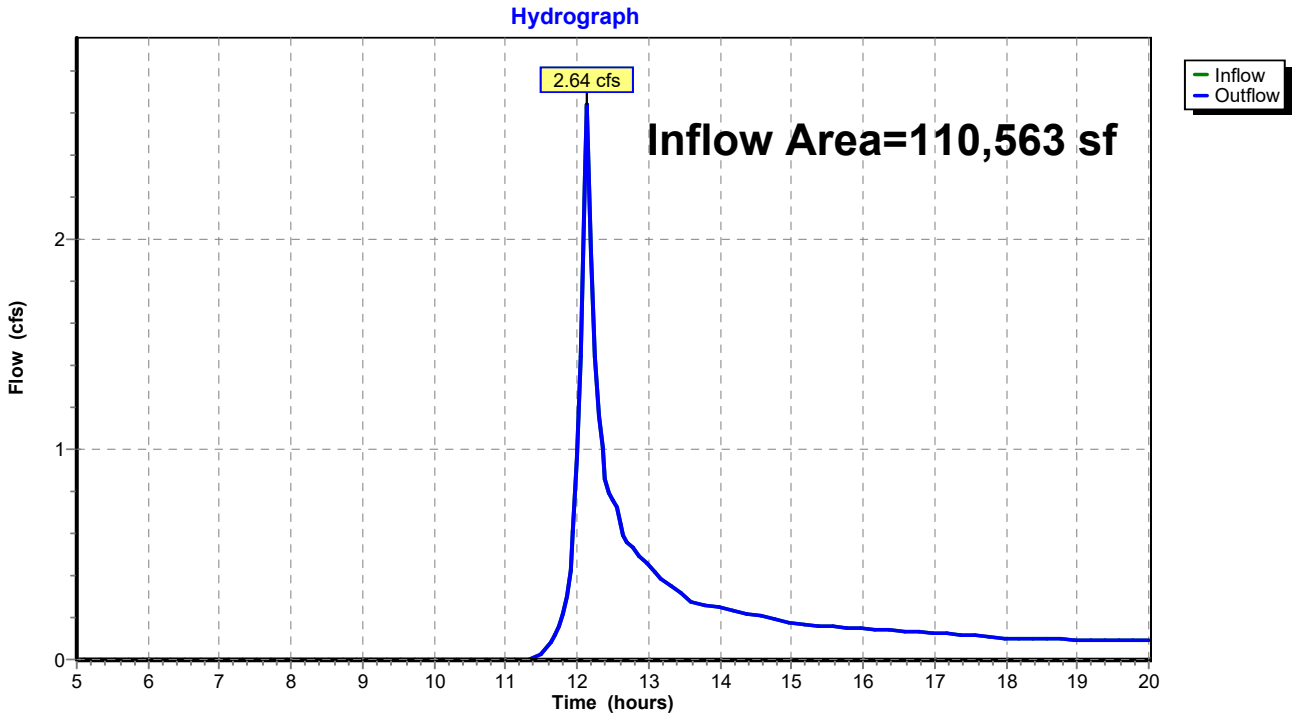


Summary for Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

Inflow Area = 110,563 sf, 0.00% Impervious, Inflow Depth > 0.88" for 5 year event
Inflow = 2.64 cfs @ 12.14 hrs, Volume= 8,132 cf
Outflow = 2.64 cfs @ 12.14 hrs, Volume= 8,132 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

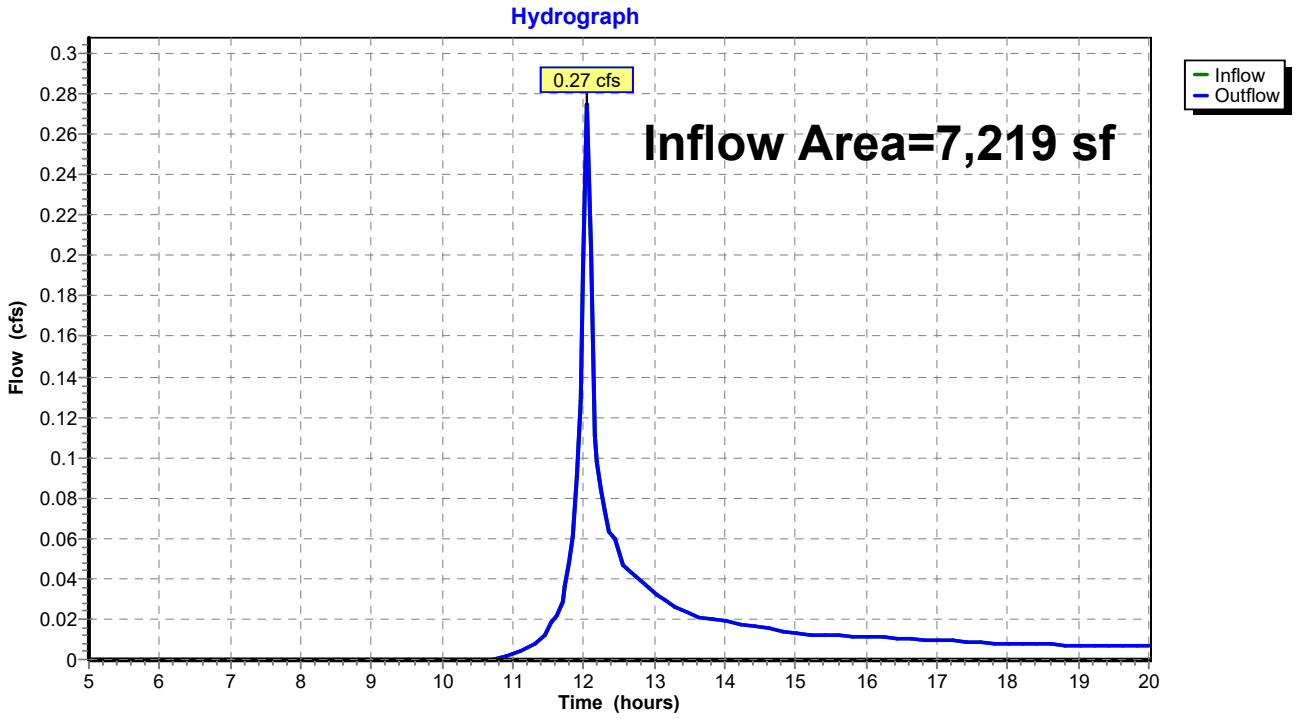


Summary for Reach EXDP#3: EXDP #3 (OFFSITE)

Inflow Area = 7,219 sf, 12.74% Impervious, Inflow Depth > 1.17" for 5 year event
Inflow = 0.27 cfs @ 12.05 hrs, Volume= 705 cf
Outflow = 0.27 cfs @ 12.05 hrs, Volume= 705 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#3: EXDP #3 (OFFSITE)

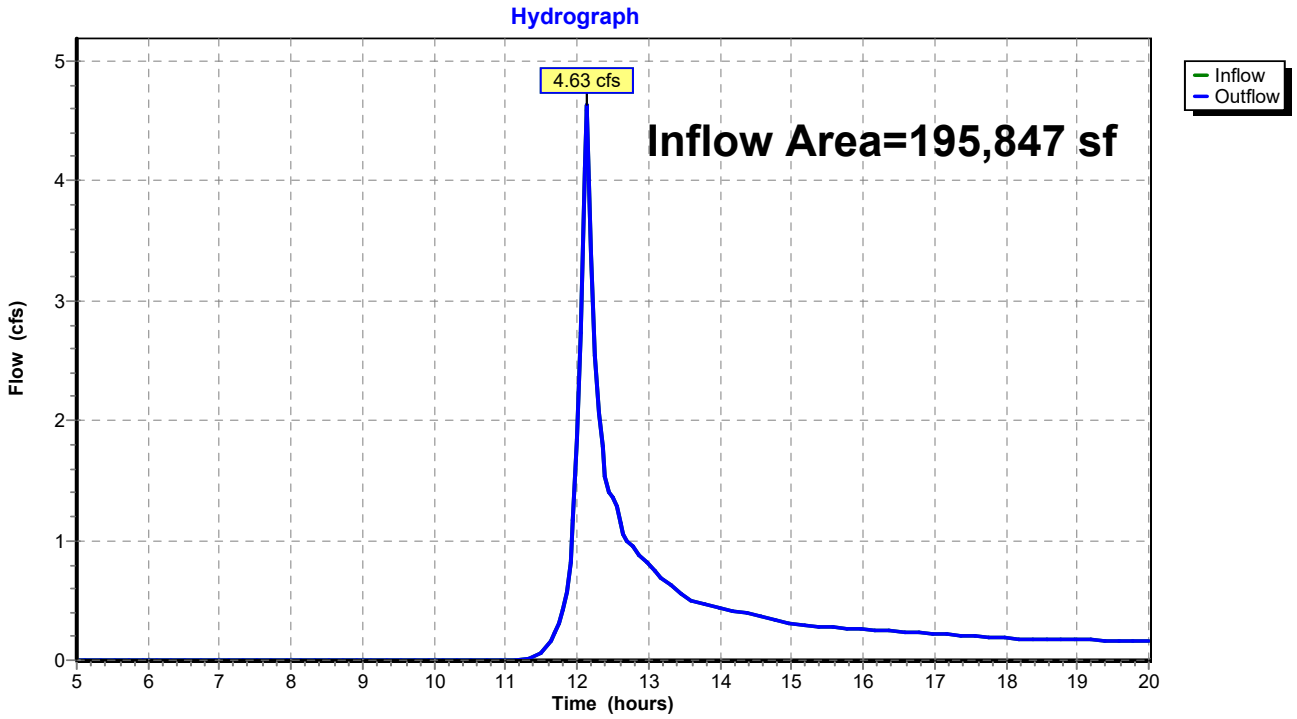


Summary for Reach EXDP#4: EXDP#4 CULVERT

Inflow Area = 195,847 sf, 0.47% Impervious, Inflow Depth > 0.89" for 5 year event
Inflow = 4.63 cfs @ 12.14 hrs, Volume= 14,579 cf
Outflow = 4.63 cfs @ 12.14 hrs, Volume= 14,579 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#4: EXDP#4 CULVERT



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EXDA#1: EX DA#1 Runoff Area=78,065 sf 0.00% Impervious Runoff Depth>1.34"
Tc=6.0 min CN=61 Runoff=2.96 cfs 8,749 cf

Subcatchment EXDA#2: EX DA #2 Runoff Area=110,563 sf 0.00% Impervious Runoff Depth>1.34"
Tc=6.0 min CN=61 Runoff=4.19 cfs 12,392 cf

Subcatchment EXDA#3: EX DA #3 Runoff Area=7,219 sf 12.74% Impervious Runoff Depth>1.71"
Tc=0.0 min CN=66 Runoff=0.41 cfs 1,026 cf

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND) Inflow=2.96 cfs 8,749 cf
Outflow=2.96 cfs 8,749 cf

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND) Inflow=4.19 cfs 12,392 cf
Outflow=4.19 cfs 12,392 cf

Reach EXDP#3: EXDP #3 (OFFSITE) Inflow=0.41 cfs 1,026 cf
Outflow=0.41 cfs 1,026 cf

Reach EXDP#4: EXDP#4 CULVERT Inflow=7.34 cfs 22,167 cf
Outflow=7.34 cfs 22,167 cf

Total Runoff Area = 195,847 sf Runoff Volume = 22,167 cf Average Runoff Depth = 1.36"
99.53% Pervious = 194,927 sf 0.47% Impervious = 920 sf

Summary for Subcatchment EXDA#1: EX DA#1

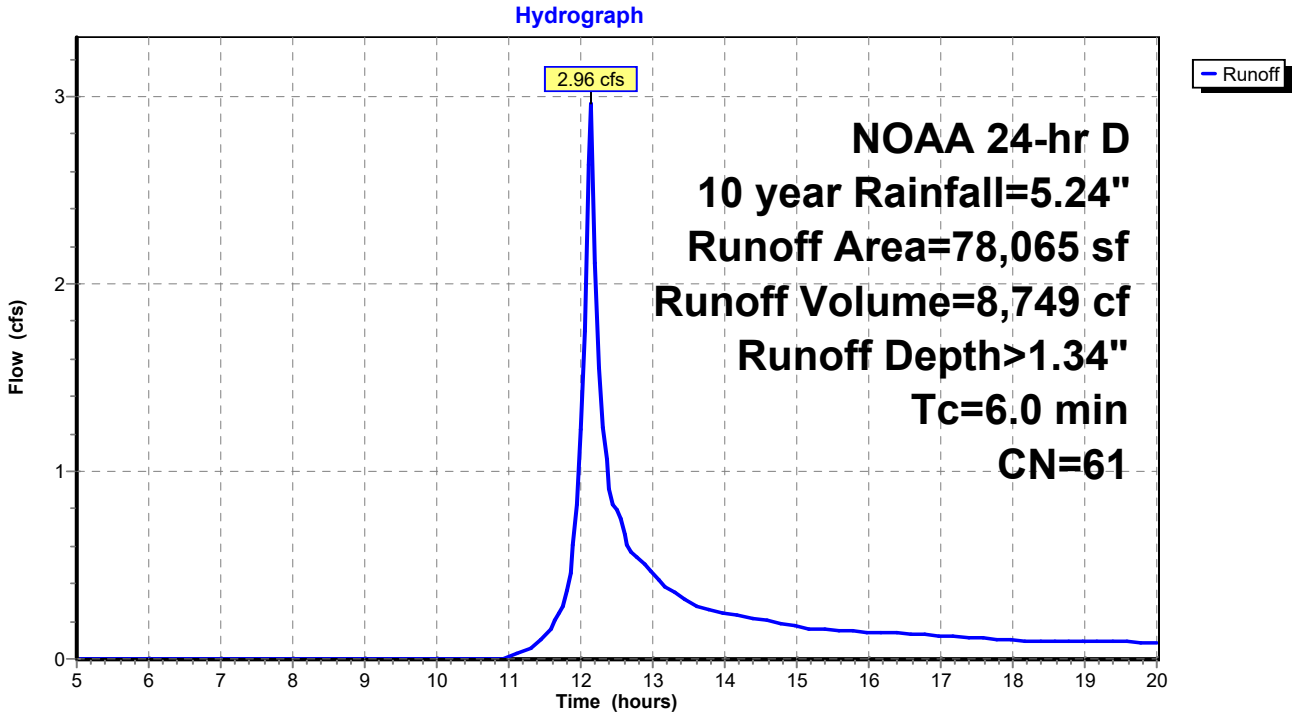
Runoff = 2.96 cfs @ 12.14 hrs, Volume= 8,749 cf, Depth> 1.34"
Routed to Reach EXDP#1 : EXDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Description
78,065	61	>75% Grass cover, Good, HSG B
78,065		100.00% Pervious Area

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

Subcatchment EXDA#1: EX DA#1



Summary for Subcatchment EXDA#2: EX DA #2

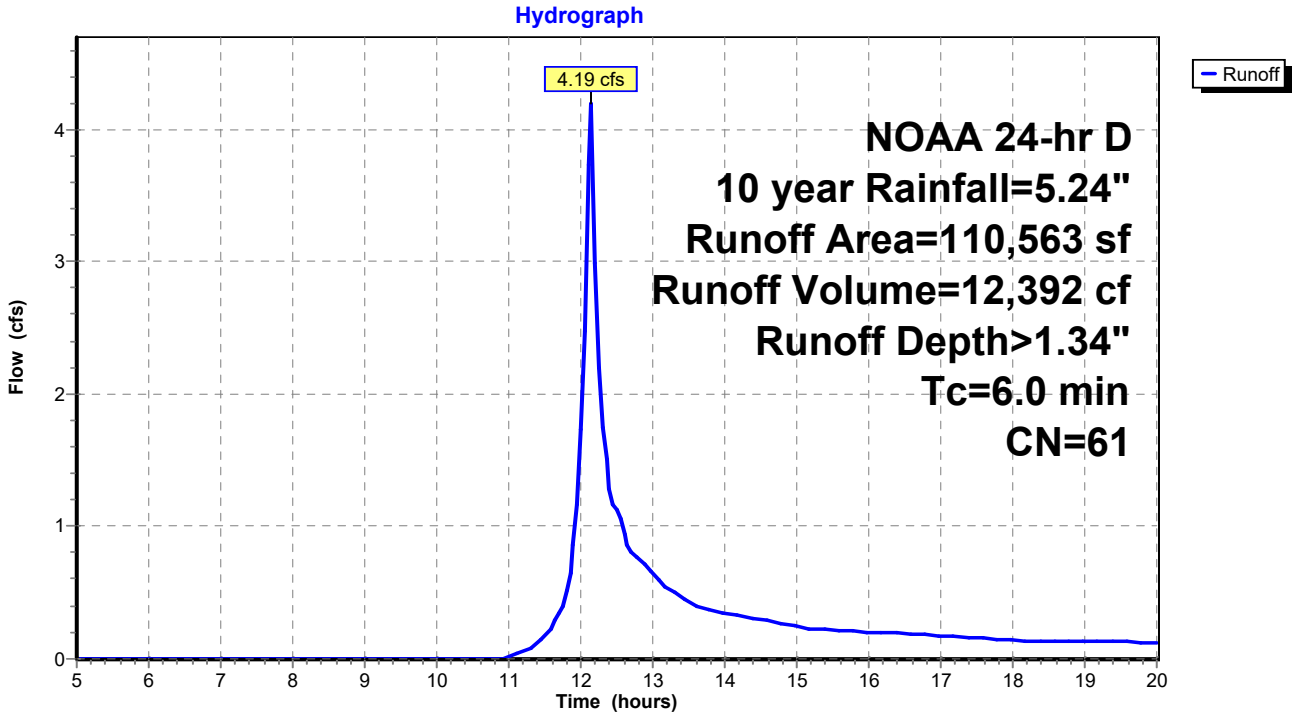
Runoff = 4.19 cfs @ 12.14 hrs, Volume= 12,392 cf, Depth> 1.34"
Routed to Reach EXDP#2 : EXDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Description
110,563	61	>75% Grass cover, Good, HSG B
110,563		100.00% Pervious Area

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

Subcatchment EXDA#2: EX DA #2



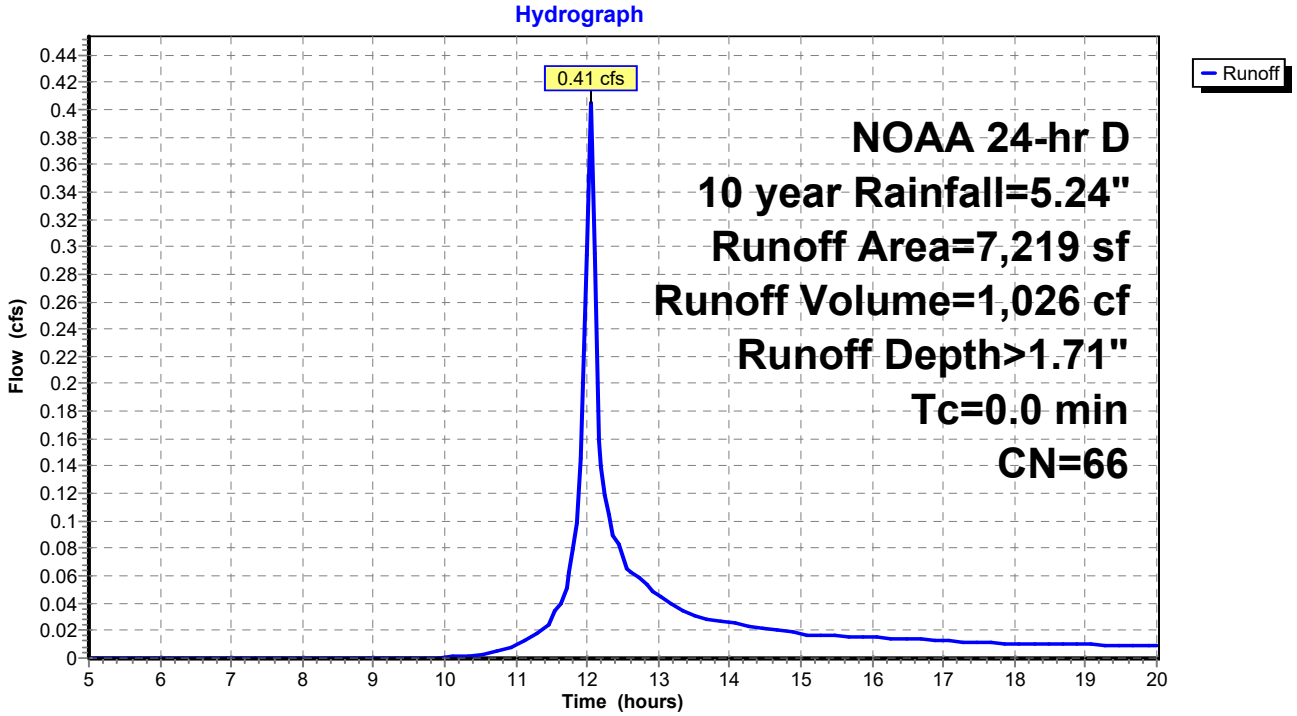
Summary for Subcatchment EXDA#3: EX DA #3

Runoff = 0.41 cfs @ 12.05 hrs, Volume= 1,026 cf, Depth> 1.71"
Routed to Reach EXDP#3 : EXDP #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Description
6,299	61	>75% Grass cover, Good, HSG B
920	98	Paved parking, HSG B
7,219	66	Weighted Average
6,299		87.26% Pervious Area
920		12.74% Impervious Area

Subcatchment EXDA#3: EX DA #3

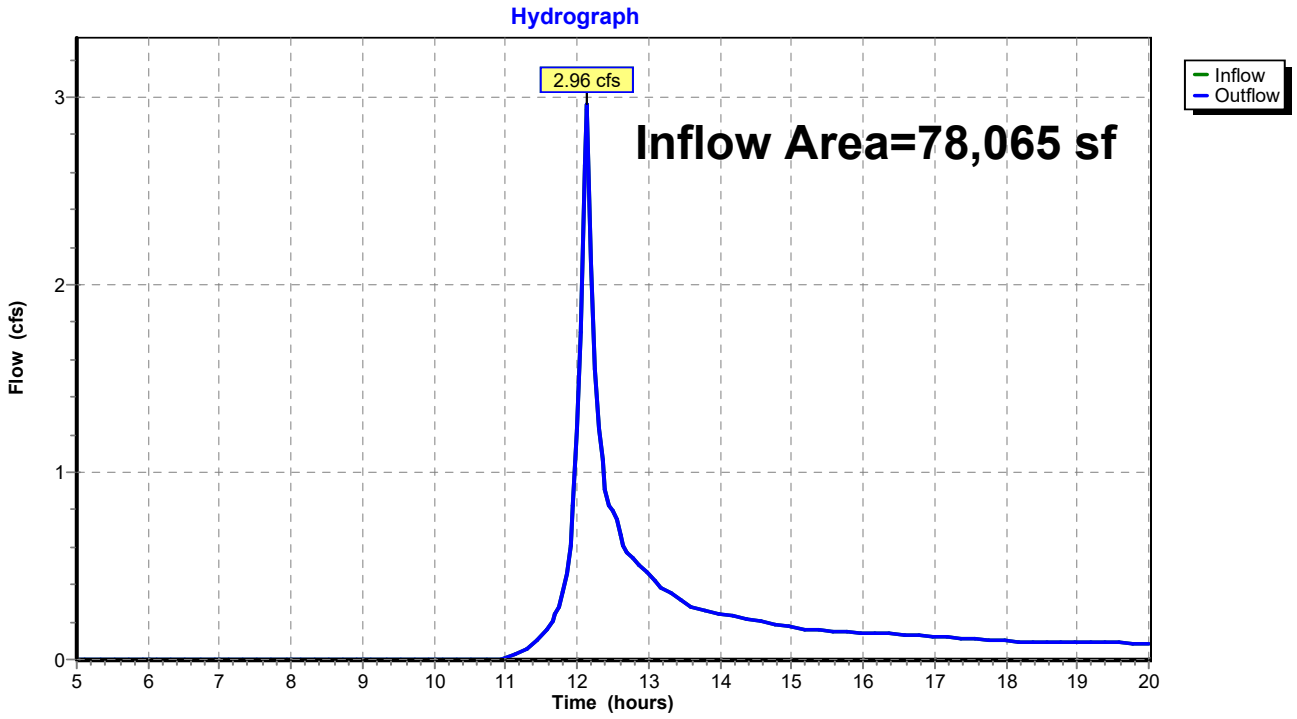


Summary for Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

Inflow Area = 78,065 sf, 0.00% Impervious, Inflow Depth > 1.34" for 10 year event
Inflow = 2.96 cfs @ 12.14 hrs, Volume= 8,749 cf
Outflow = 2.96 cfs @ 12.14 hrs, Volume= 8,749 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

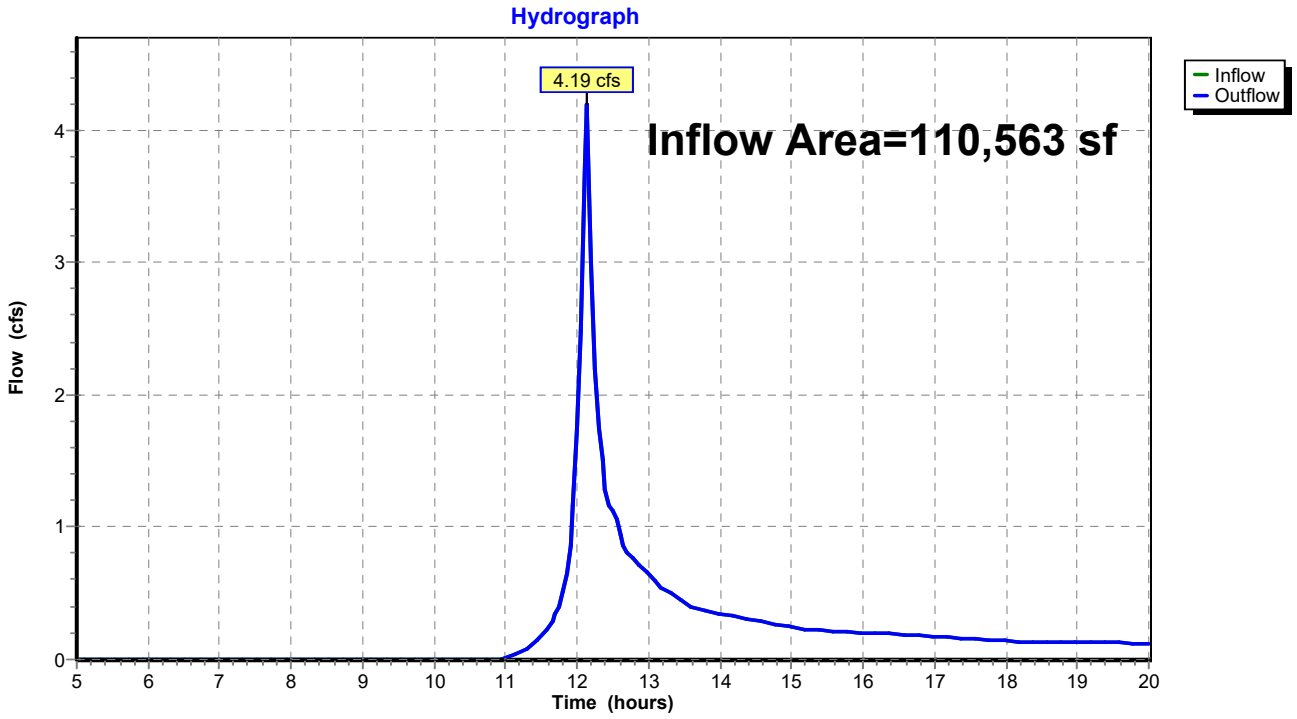


Summary for Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

Inflow Area = 110,563 sf, 0.00% Impervious, Inflow Depth > 1.34" for 10 year event
Inflow = 4.19 cfs @ 12.14 hrs, Volume= 12,392 cf
Outflow = 4.19 cfs @ 12.14 hrs, Volume= 12,392 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

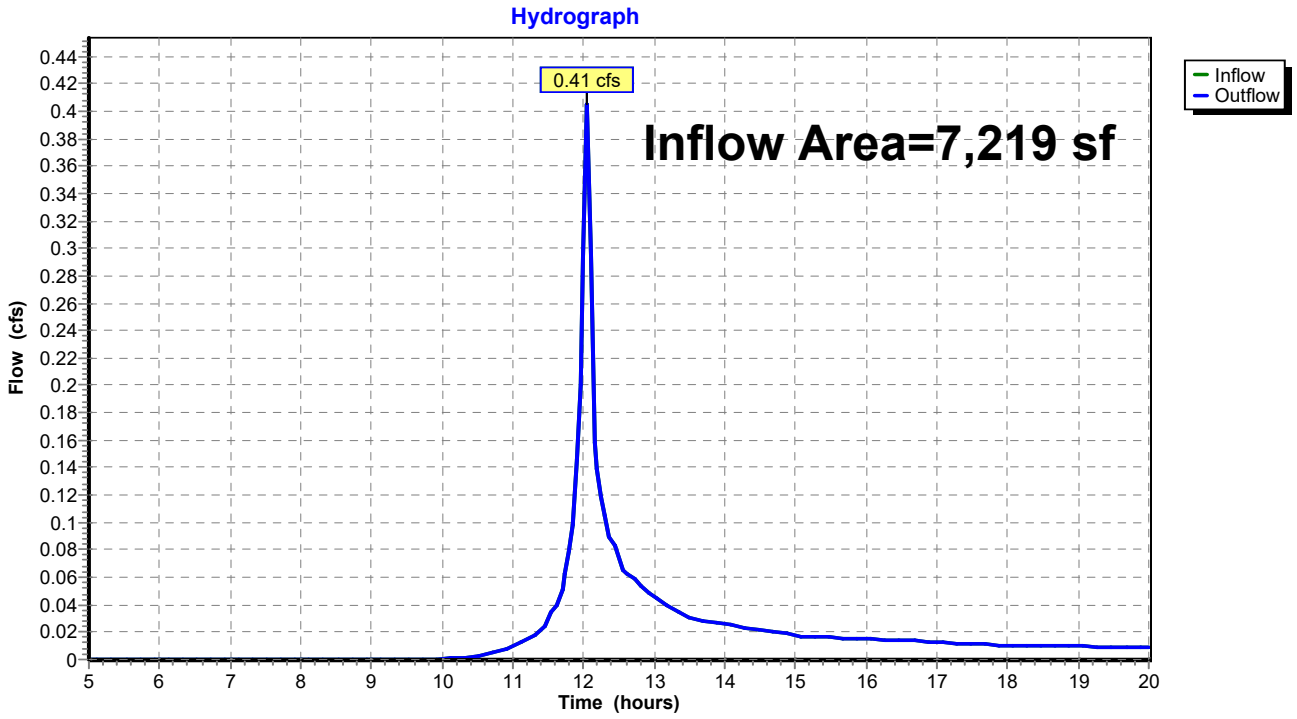


Summary for Reach EXDP#3: EXDP #3 (OFFSITE)

Inflow Area = 7,219 sf, 12.74% Impervious, Inflow Depth > 1.71" for 10 year event
Inflow = 0.41 cfs @ 12.05 hrs, Volume= 1,026 cf
Outflow = 0.41 cfs @ 12.05 hrs, Volume= 1,026 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#3: EXDP #3 (OFFSITE)

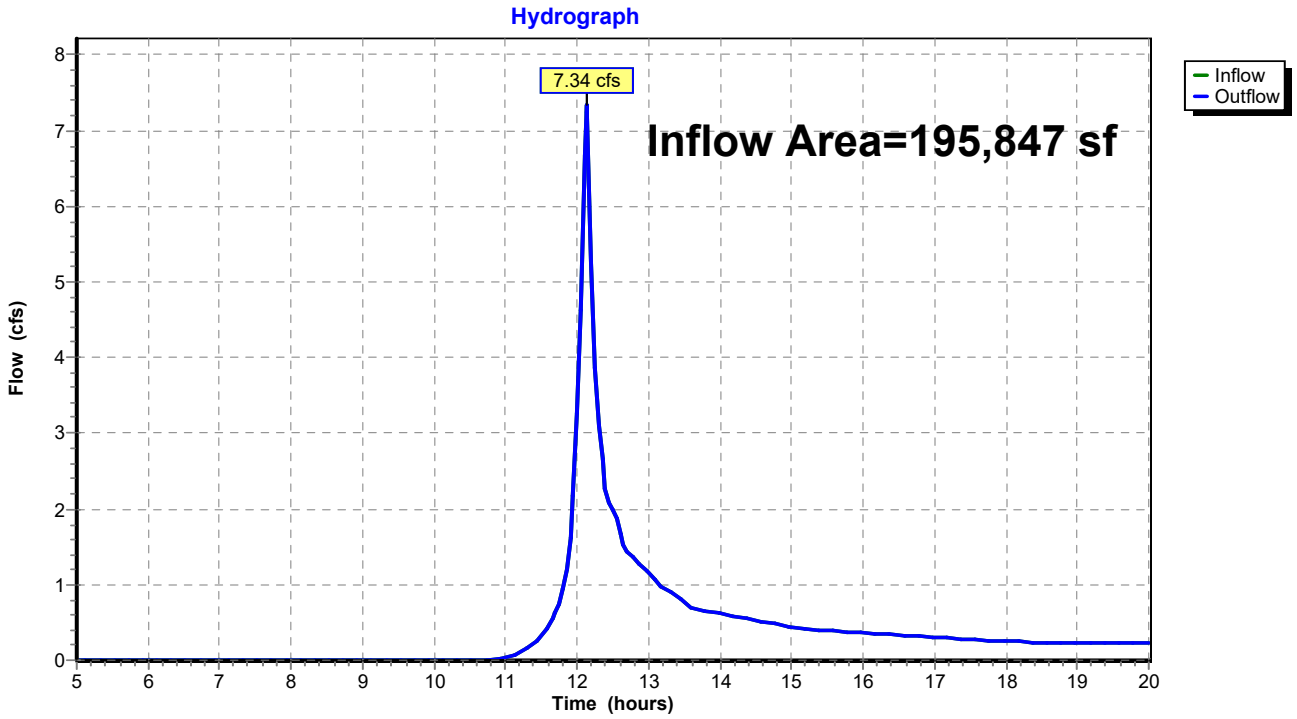


Summary for Reach EXDP#4: EXDP#4 CULVERT

Inflow Area = 195,847 sf, 0.47% Impervious, Inflow Depth > 1.36" for 10 year event
Inflow = 7.34 cfs @ 12.14 hrs, Volume= 22,167 cf
Outflow = 7.34 cfs @ 12.14 hrs, Volume= 22,167 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#4: EXDP#4 CULVERT



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEXDA#1: EX DA#1 Runoff Area=78,065 sf 0.00% Impervious Runoff Depth>2.06"
Tc=6.0 min CN=61 Runoff=4.63 cfs 13,422 cf

SubcatchmentEXDA#2: EX DA #2 Runoff Area=110,563 sf 0.00% Impervious Runoff Depth>2.06"
Tc=6.0 min CN=61 Runoff=6.55 cfs 19,010 cf

SubcatchmentEXDA#3: EX DA #3 Runoff Area=7,219 sf 12.74% Impervious Runoff Depth>2.51"
Tc=0.0 min CN=66 Runoff=0.60 cfs 1,511 cf

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND) Inflow=4.63 cfs 13,422 cf
Outflow=4.63 cfs 13,422 cf

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND) Inflow=6.55 cfs 19,010 cf
Outflow=6.55 cfs 19,010 cf

Reach EXDP#3: EXDP #3 (OFFSITE) Inflow=0.60 cfs 1,511 cf
Outflow=0.60 cfs 1,511 cf

Reach EXDP#4: EXDP#4 CULVERT Inflow=11.45 cfs 33,943 cf
Outflow=11.45 cfs 33,943 cf

Total Runoff Area = 195,847 sf Runoff Volume = 33,943 cf Average Runoff Depth = 2.08"
99.53% Pervious = 194,927 sf 0.47% Impervious = 920 sf

Summary for Subcatchment EXDA#1: EX DA#1

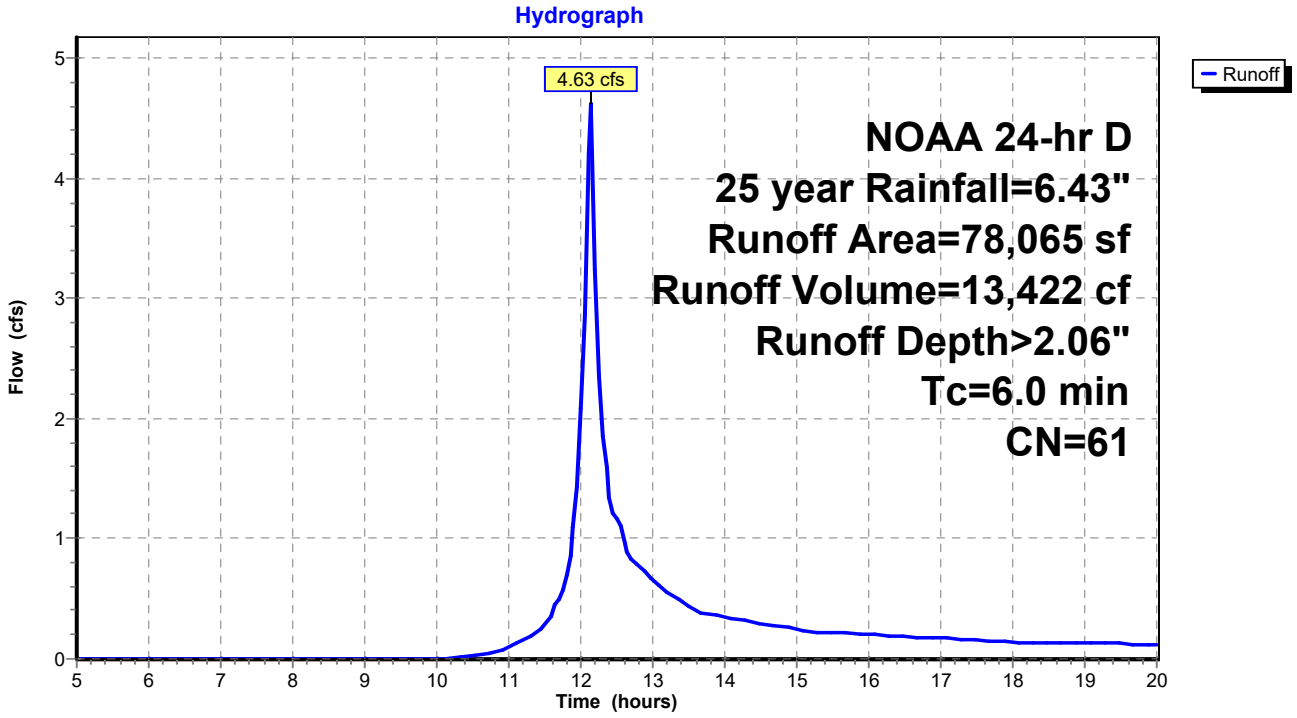
Runoff = 4.63 cfs @ 12.14 hrs, Volume= 13,422 cf, Depth> 2.06"
Routed to Reach EXDP#1 : EXDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Description
78,065	61	>75% Grass cover, Good, HSG B
78,065		100.00% Pervious Area

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

Subcatchment EXDA#1: EX DA#1



Summary for Subcatchment EXDA#2: EX DA #2

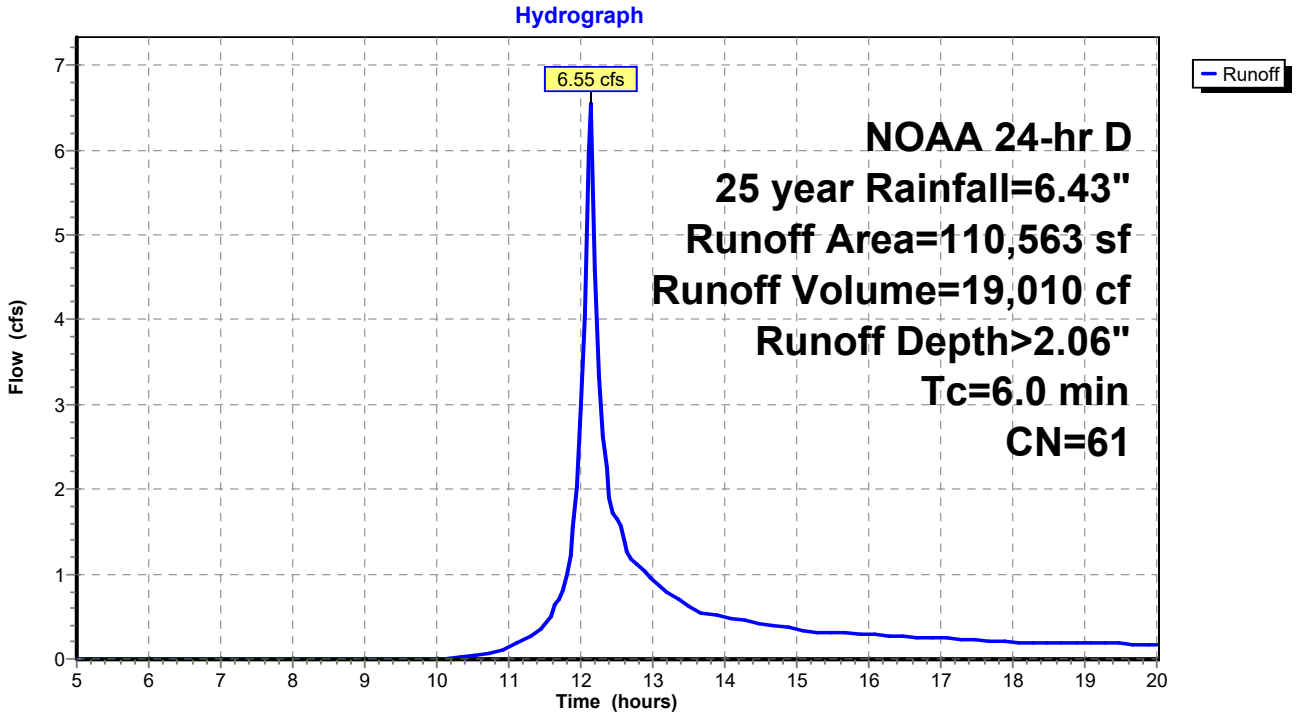
Runoff = 6.55 cfs @ 12.14 hrs, Volume= 19,010 cf, Depth> 2.06"
Routed to Reach EXDP#2 : EXDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Description
110,563	61	>75% Grass cover, Good, HSG B
110,563		100.00% Pervious Area

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

Subcatchment EXDA#2: EX DA #2



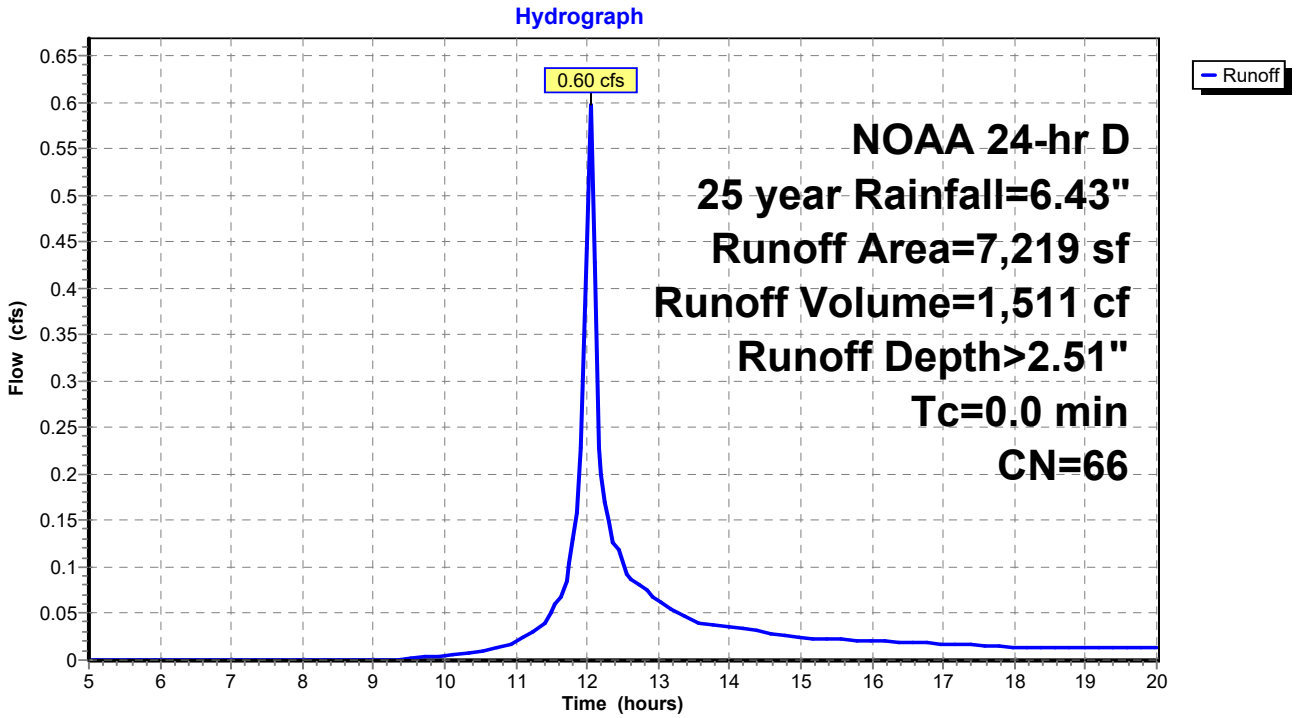
Summary for Subcatchment EXDA#3: EX DA #3

Runoff = 0.60 cfs @ 12.05 hrs, Volume= 1,511 cf, Depth> 2.51"
Routed to Reach EXDP#3 : EXDP #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Description
6,299	61	>75% Grass cover, Good, HSG B
920	98	Paved parking, HSG B
7,219	66	Weighted Average
6,299		87.26% Pervious Area
920		12.74% Impervious Area

Subcatchment EXDA#3: EX DA #3

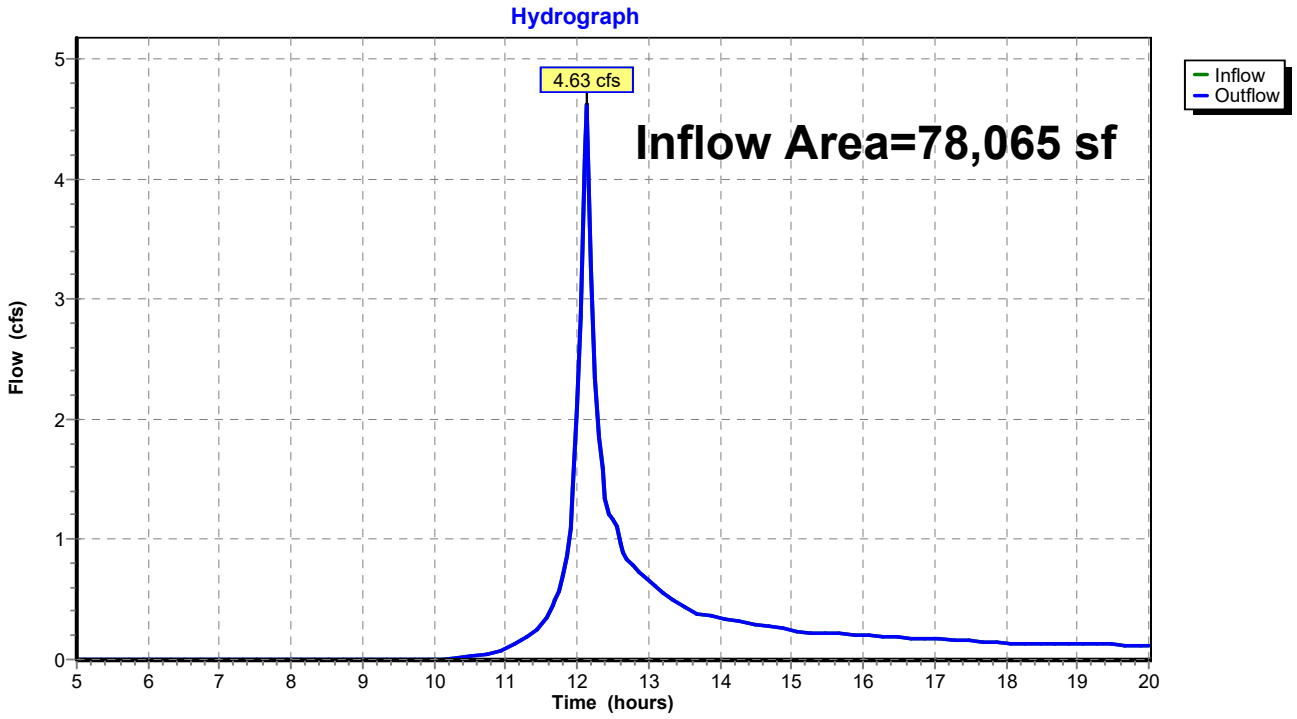


Summary for Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

Inflow Area = 78,065 sf, 0.00% Impervious, Inflow Depth > 2.06" for 25 year event
Inflow = 4.63 cfs @ 12.14 hrs, Volume= 13,422 cf
Outflow = 4.63 cfs @ 12.14 hrs, Volume= 13,422 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

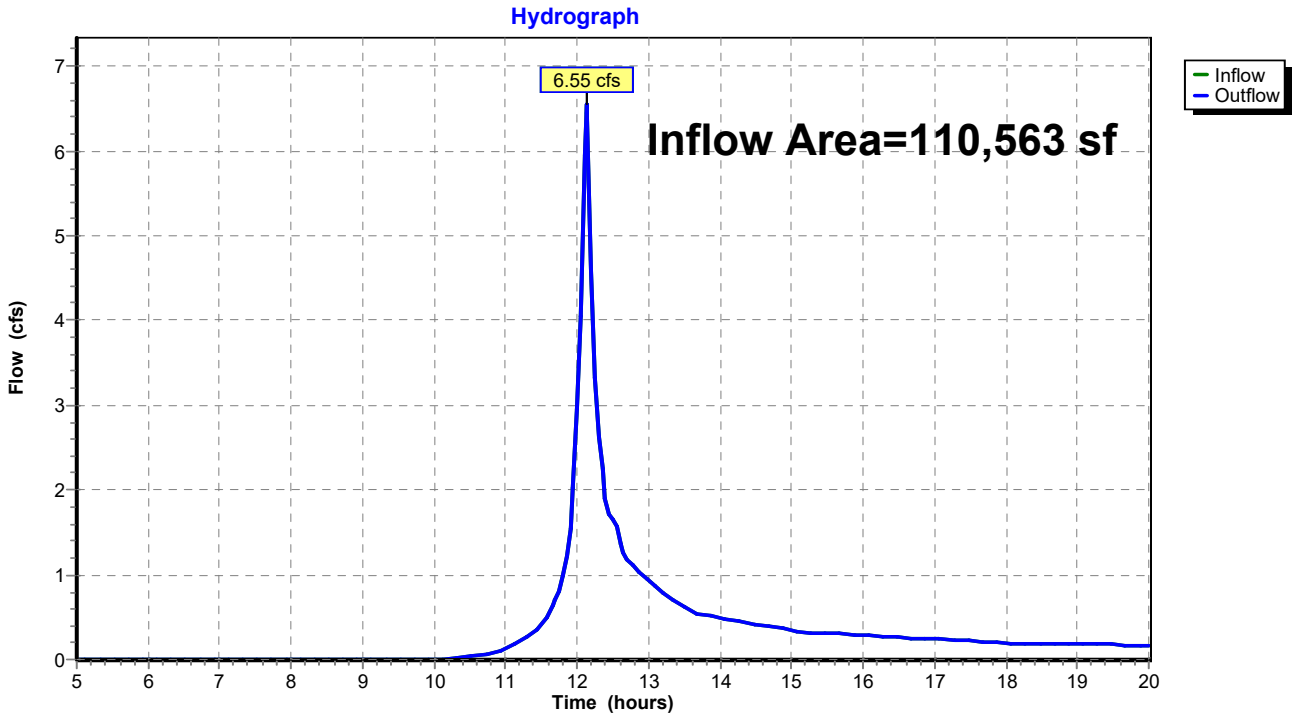


Summary for Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

Inflow Area = 110,563 sf, 0.00% Impervious, Inflow Depth > 2.06" for 25 year event
Inflow = 6.55 cfs @ 12.14 hrs, Volume= 19,010 cf
Outflow = 6.55 cfs @ 12.14 hrs, Volume= 19,010 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

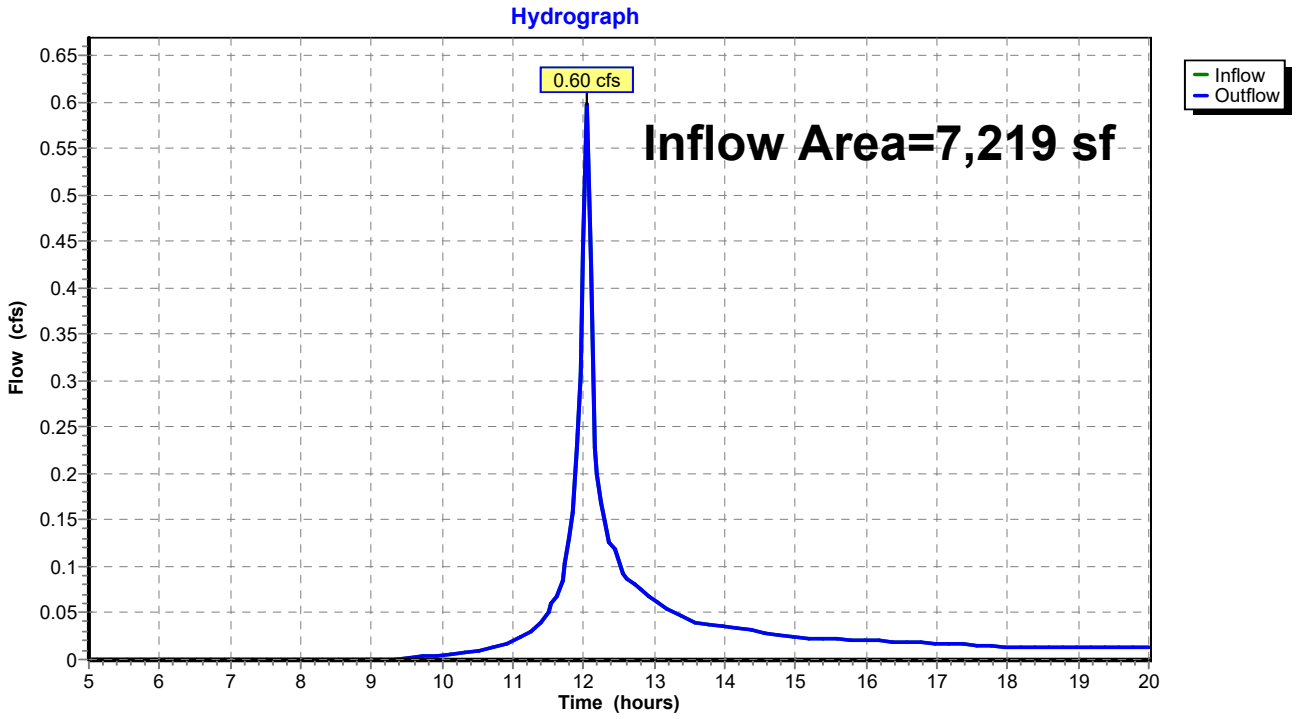


Summary for Reach EXDP#3: EXDP #3 (OFFSITE)

Inflow Area = 7,219 sf, 12.74% Impervious, Inflow Depth > 2.51" for 25 year event
Inflow = 0.60 cfs @ 12.05 hrs, Volume= 1,511 cf
Outflow = 0.60 cfs @ 12.05 hrs, Volume= 1,511 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#3: EXDP #3 (OFFSITE)

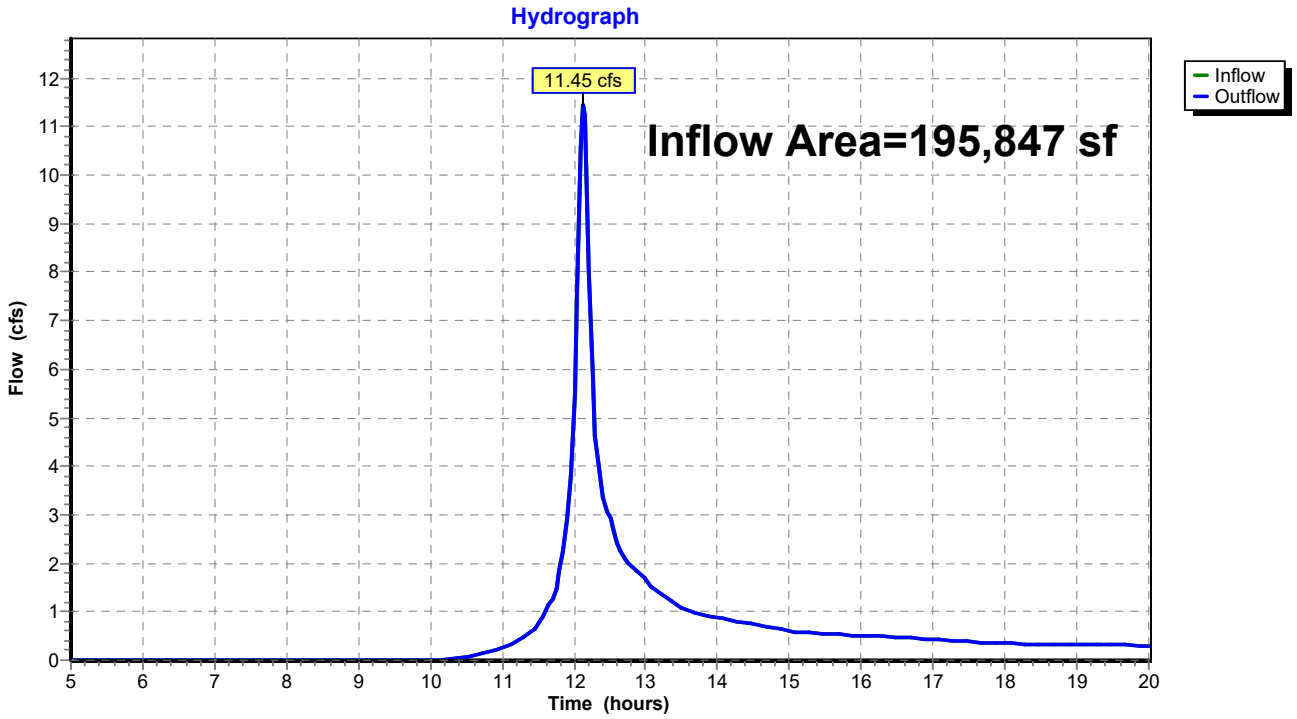


Summary for Reach EXDP#4: EXDP#4 CULVERT

Inflow Area = 195,847 sf, 0.47% Impervious, Inflow Depth > 2.08" for 25 year event
Inflow = 11.45 cfs @ 12.13 hrs, Volume= 33,943 cf
Outflow = 11.45 cfs @ 12.13 hrs, Volume= 33,943 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#4: EXDP#4 CULVERT



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEXDA#1: EX DA#1 Runoff Area=78,065 sf 0.00% Impervious Runoff Depth>3.31"
Tc=6.0 min CN=61 Runoff=7.43 cfs 21,511 cf

SubcatchmentEXDA#2: EX DA #2 Runoff Area=110,563 sf 0.00% Impervious Runoff Depth>3.31"
Tc=6.0 min CN=61 Runoff=10.53 cfs 30,465 cf

SubcatchmentEXDA#3: EX DA #3 Runoff Area=7,219 sf 12.74% Impervious Runoff Depth>3.87"
Tc=0.0 min CN=66 Runoff=0.91 cfs 2,327 cf

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND) Inflow=7.43 cfs 21,511 cf
Outflow=7.43 cfs 21,511 cf

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND) Inflow=10.53 cfs 30,465 cf
Outflow=10.53 cfs 30,465 cf

Reach EXDP#3: EXDP #3 (OFFSITE) Inflow=0.91 cfs 2,327 cf
Outflow=0.91 cfs 2,327 cf

Reach EXDP#4: EXDP#4 CULVERT Inflow=18.38 cfs 54,303 cf
Outflow=18.38 cfs 54,303 cf

Total Runoff Area = 195,847 sf Runoff Volume = 54,303 cf Average Runoff Depth = 3.33"
99.53% Pervious = 194,927 sf 0.47% Impervious = 920 sf

Summary for Subcatchment EXDA#1: EX DA#1

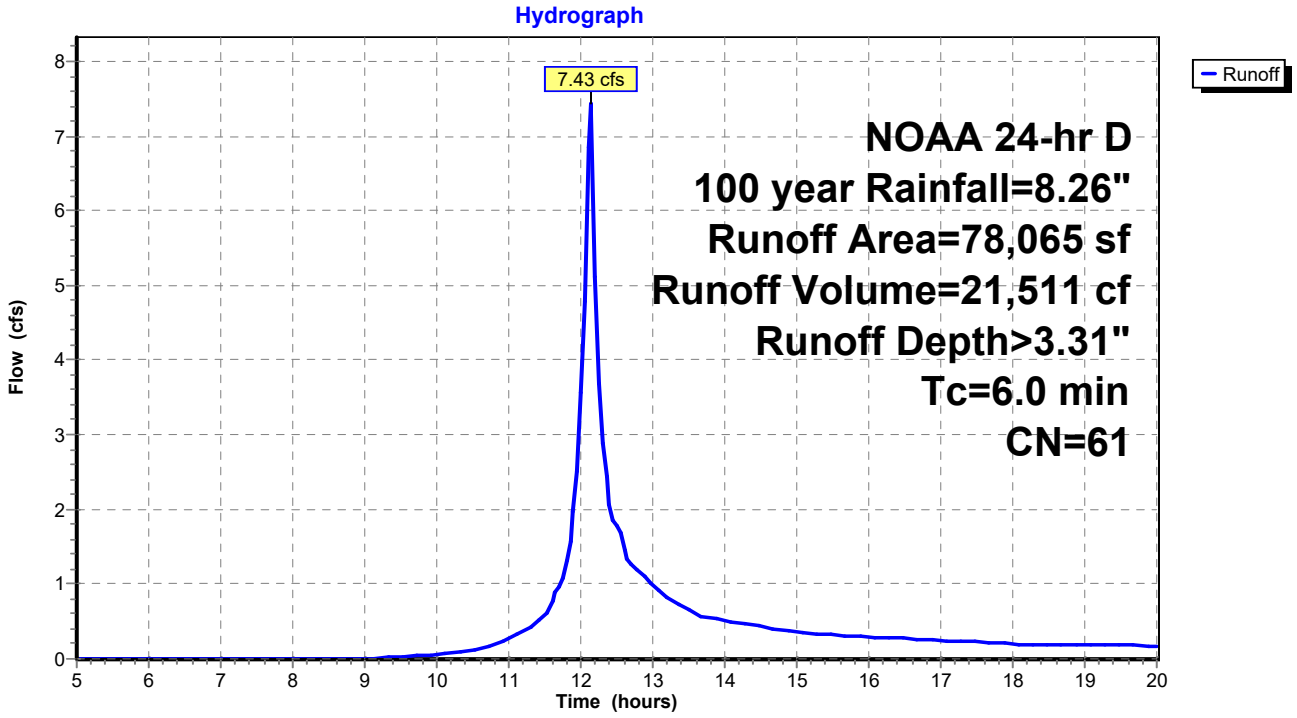
Runoff = 7.43 cfs @ 12.13 hrs, Volume= 21,511 cf, Depth> 3.31"
Routed to Reach EXDP#1 : EXDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Description
78,065	61	>75% Grass cover, Good, HSG B
78,065		100.00% Pervious Area

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

Subcatchment EXDA#1: EX DA#1



Summary for Subcatchment EXDA#2: EX DA #2

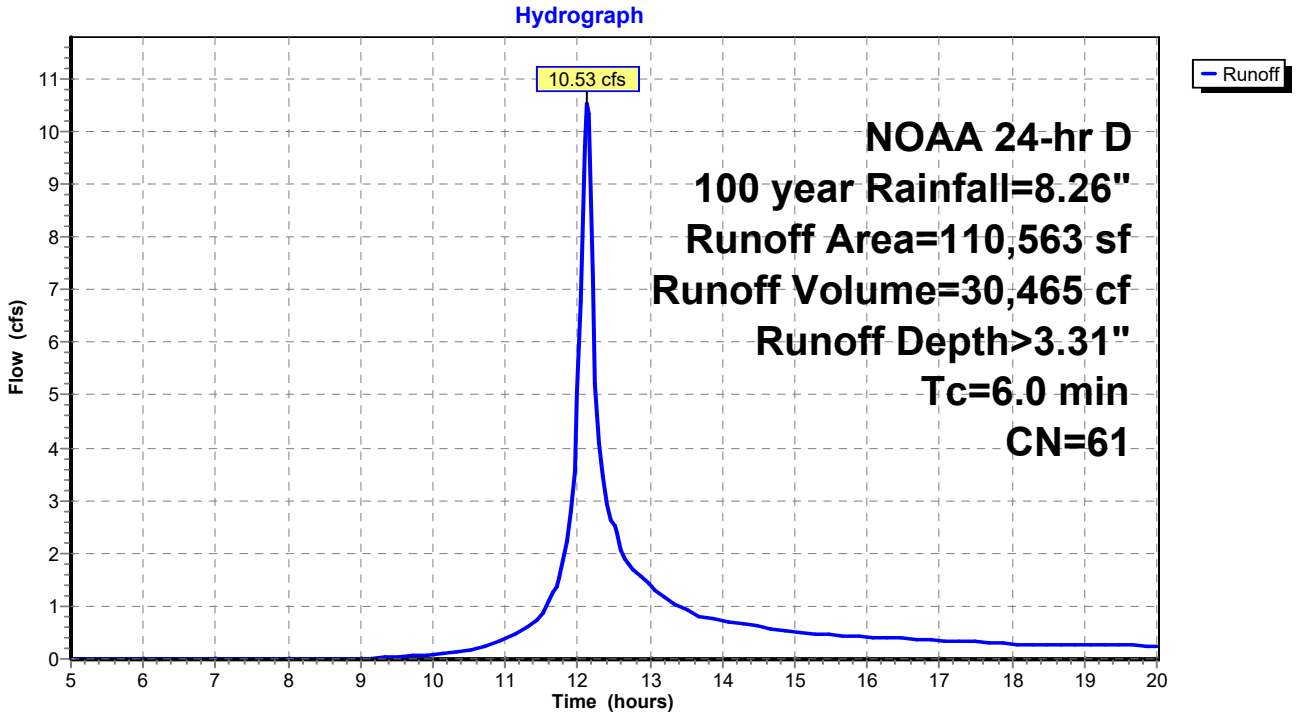
Runoff = 10.53 cfs @ 12.13 hrs, Volume= 30,465 cf, Depth> 3.31"
Routed to Reach EXDP#2 : EXDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Description
110,563	61	>75% Grass cover, Good, HSG B
110,563		100.00% Pervious Area

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

Subcatchment EXDA#2: EX DA #2



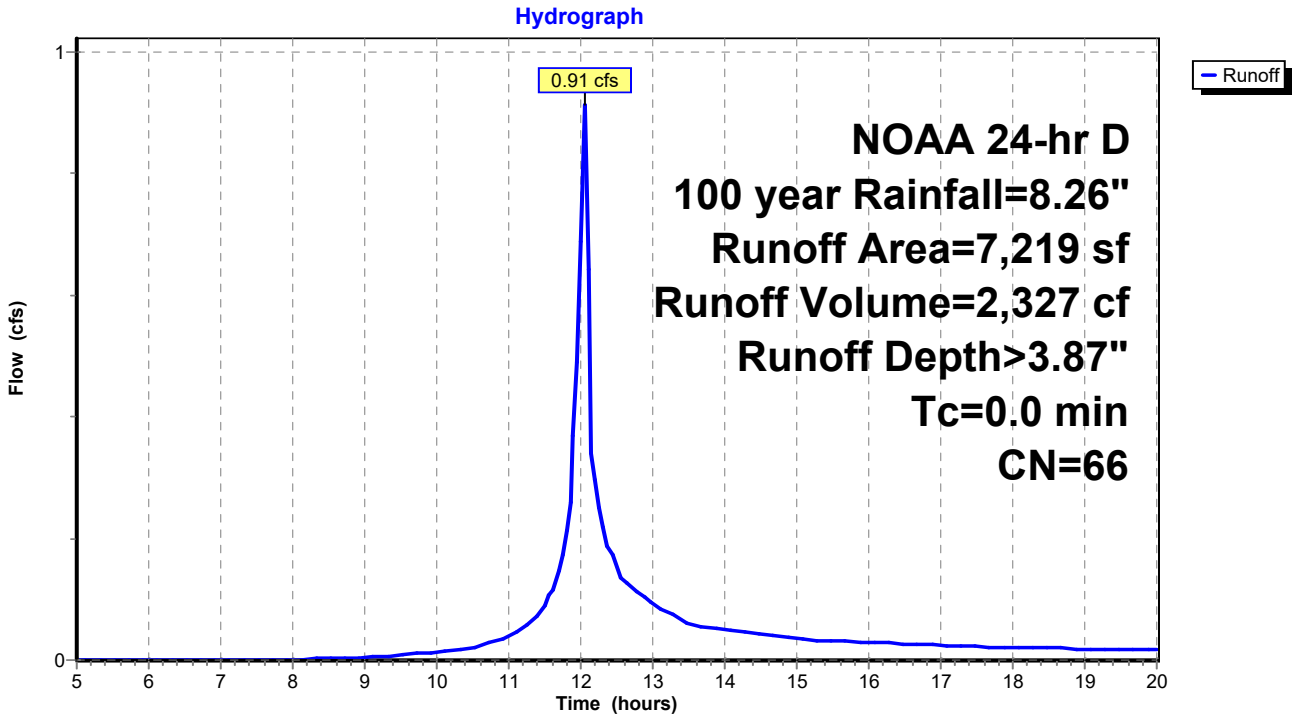
Summary for Subcatchment EXDA#3: EX DA #3

Runoff = 0.91 cfs @ 12.05 hrs, Volume= 2,327 cf, Depth> 3.87"
Routed to Reach EXDP#3 : EXDP #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Description
6,299	61	>75% Grass cover, Good, HSG B
920	98	Paved parking, HSG B
7,219	66	Weighted Average
6,299		87.26% Pervious Area
920		12.74% Impervious Area

Subcatchment EXDA#3: EX DA #3

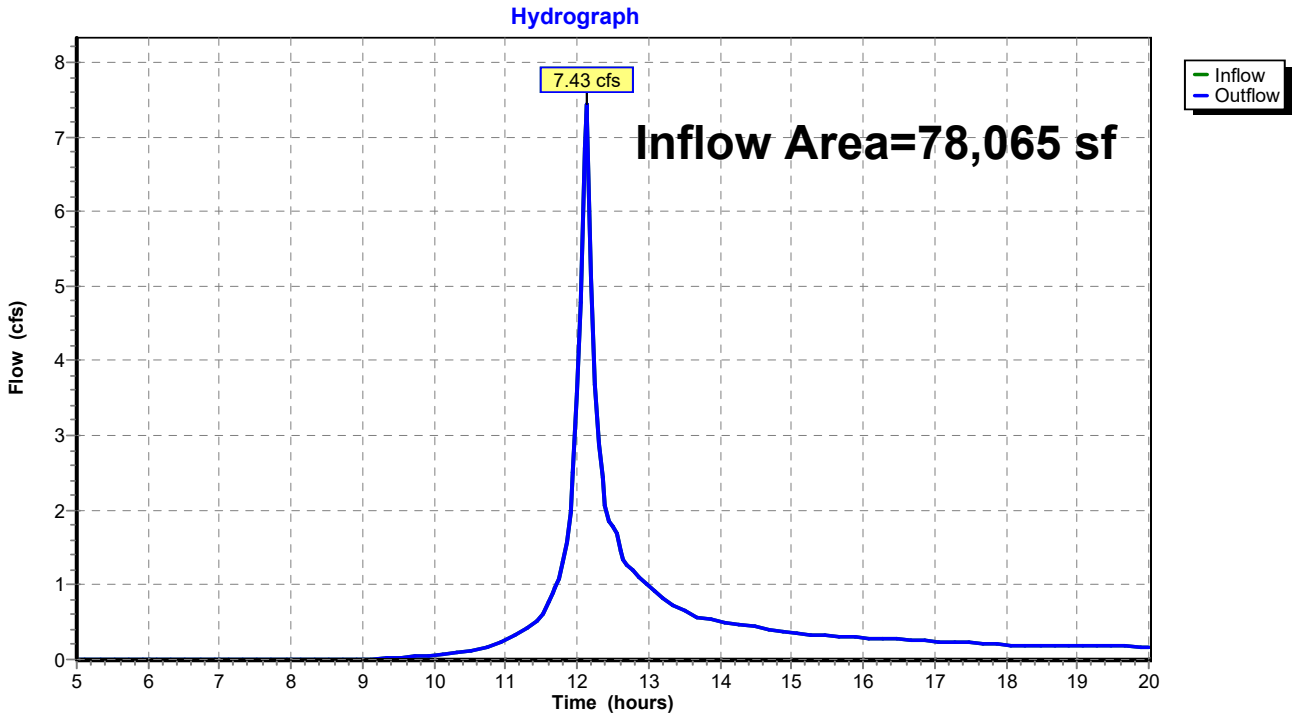


Summary for Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

Inflow Area = 78,065 sf, 0.00% Impervious, Inflow Depth > 3.31" for 100 year event
Inflow = 7.43 cfs @ 12.13 hrs, Volume= 21,511 cf
Outflow = 7.43 cfs @ 12.13 hrs, Volume= 21,511 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#1: EXDP #1 (NORTH SITE WETLAND)

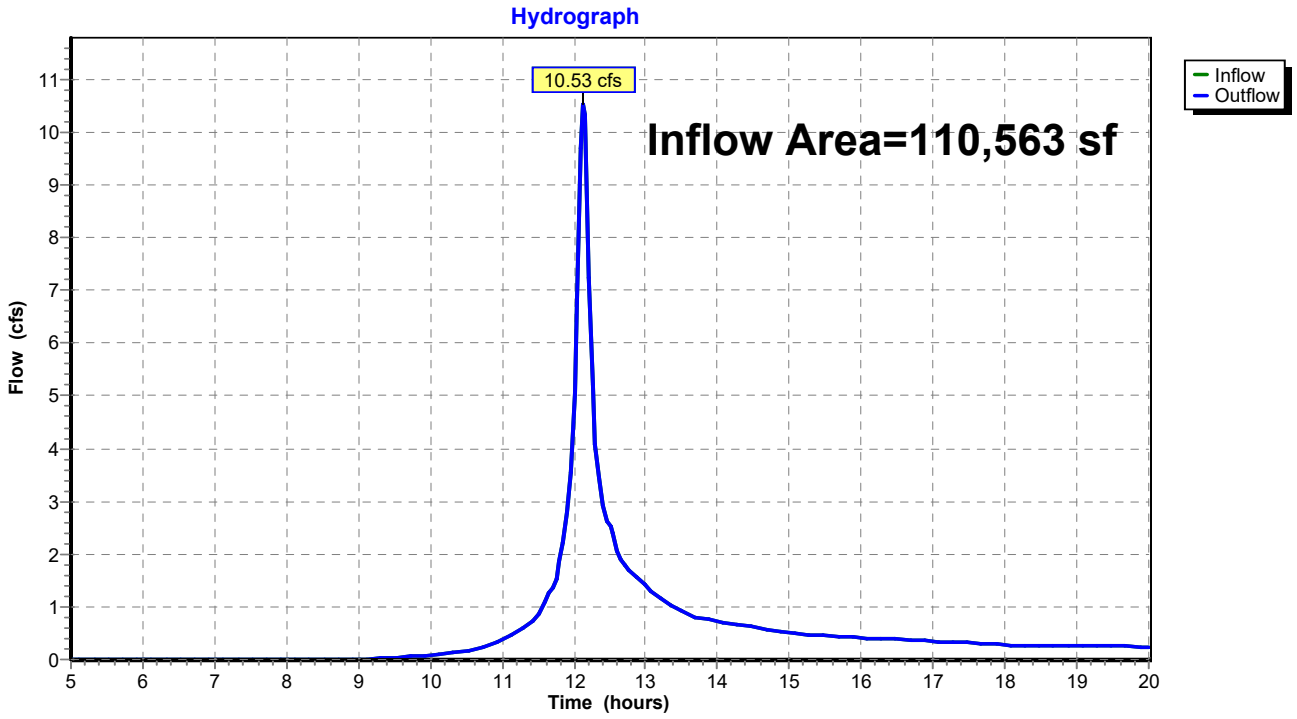


Summary for Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

Inflow Area = 110,563 sf, 0.00% Impervious, Inflow Depth > 3.31" for 100 year event
Inflow = 10.53 cfs @ 12.13 hrs, Volume= 30,465 cf
Outflow = 10.53 cfs @ 12.13 hrs, Volume= 30,465 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#2: EXDP #2 (SOUTH SITE WETLAND)

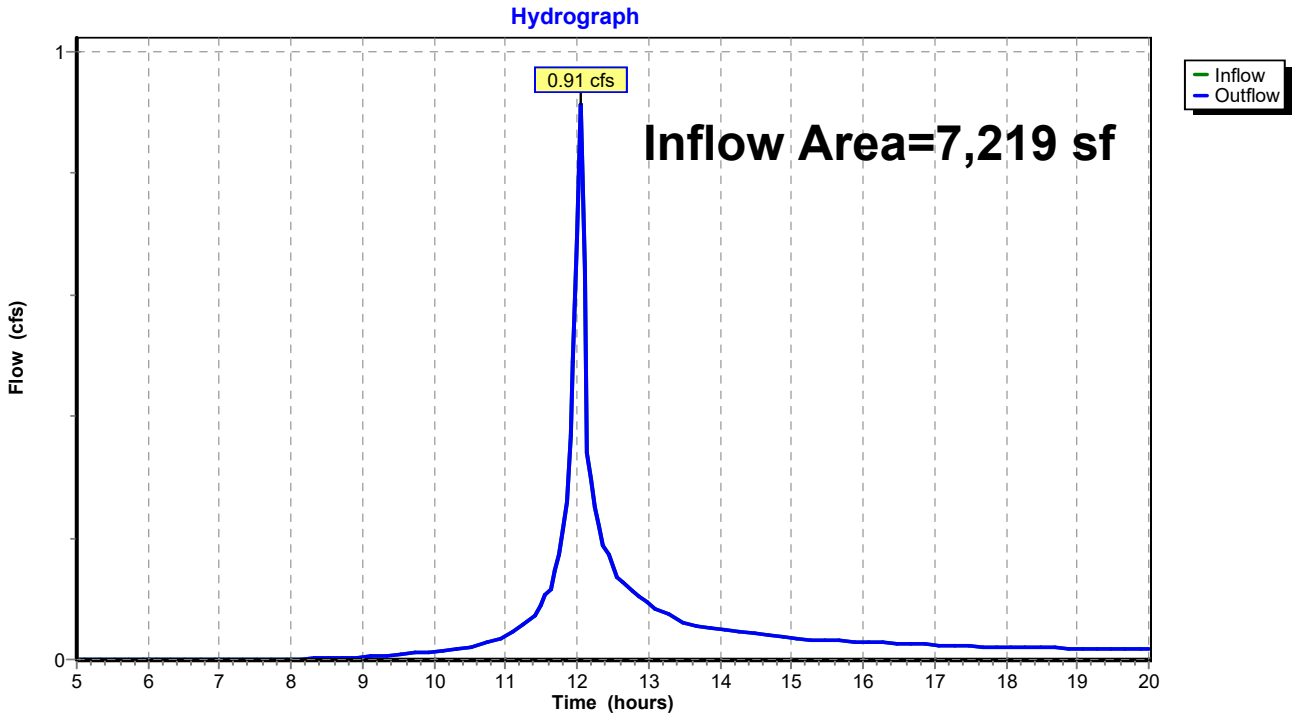


Summary for Reach EXDP#3: EXDP #3 (OFFSITE)

Inflow Area = 7,219 sf, 12.74% Impervious, Inflow Depth > 3.87" for 100 year event
Inflow = 0.91 cfs @ 12.05 hrs, Volume= 2,327 cf
Outflow = 0.91 cfs @ 12.05 hrs, Volume= 2,327 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach EXDP#4 : EXDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#3: EXDP #3 (OFFSITE)

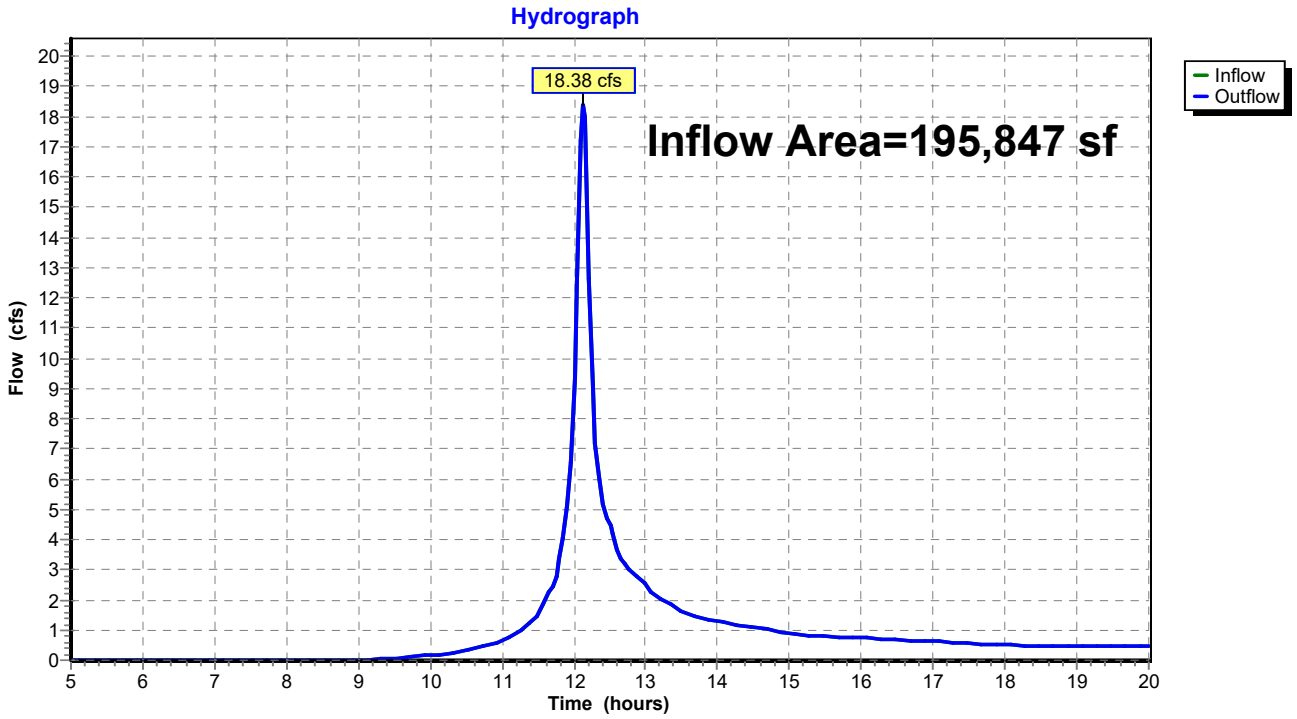


Summary for Reach EXDP#4: EXDP#4 CULVERT

Inflow Area = 195,847 sf, 0.47% Impervious, Inflow Depth > 3.33" for 100 year event
Inflow = 18.38 cfs @ 12.13 hrs, Volume= 54,303 cf
Outflow = 18.38 cfs @ 12.13 hrs, Volume= 54,303 cf, Atten= 0%, Lag= 0.0 min

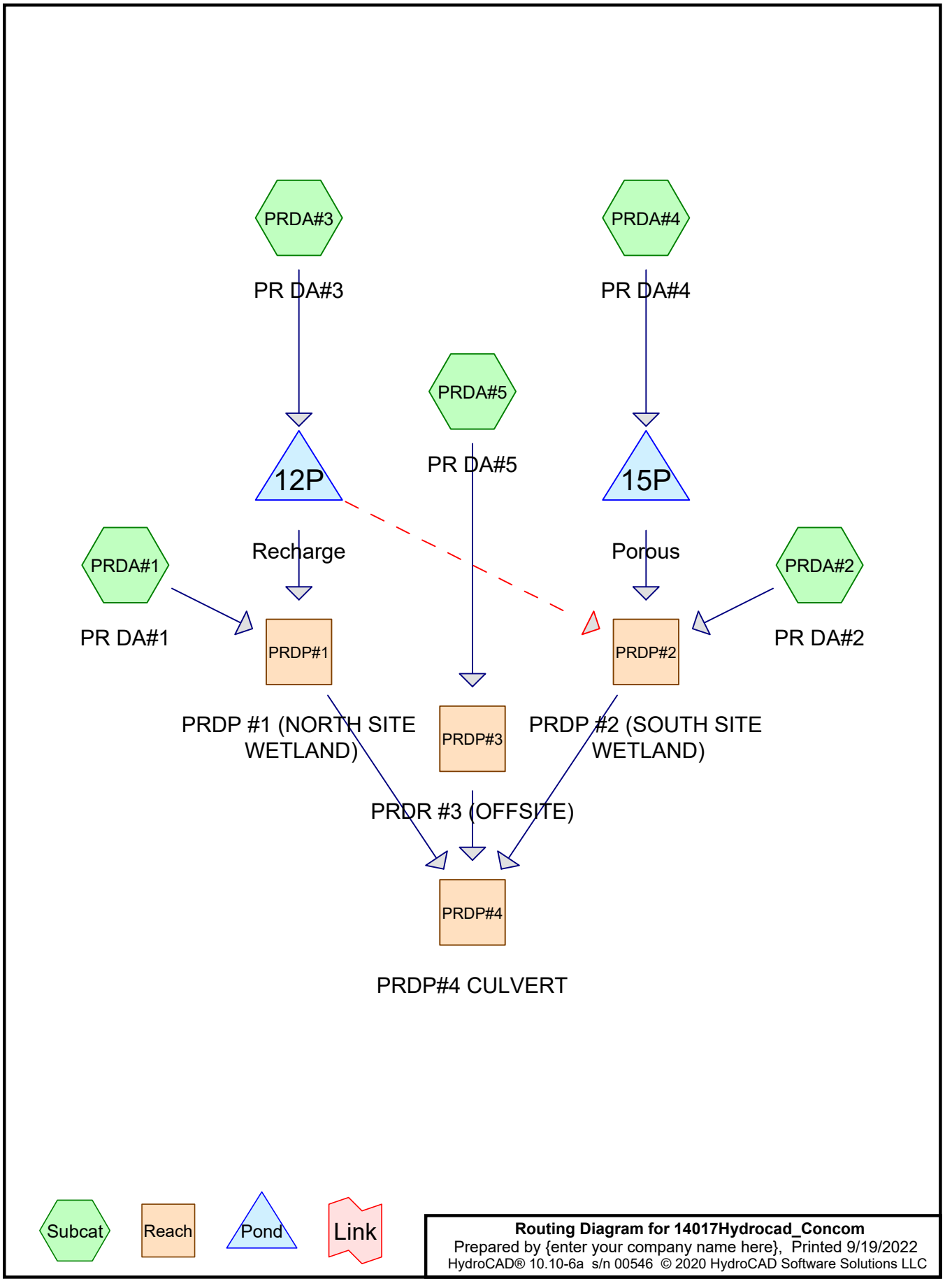
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach EXDP#4: EXDP#4 CULVERT



APPENDIX C

Post-Development Conditions – HydroCAD Calculations



Routing Diagram for 14017Hydrocad_Concom
Prepared by {enter your company name here}, Printed 9/19/2022

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	NOAA 24-hr	D	Default	24.00	1	3.33	2
2	5 year	NOAA 24-hr	D	Default	24.00	1	4.37	2
3	10 year	NOAA 24-hr	D	Default	24.00	1	5.24	2
4	25 year	NOAA 24-hr	D	Default	24.00	1	6.43	2
5	100 year	NOAA 24-hr	D	Default	24.00	1	8.26	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
9,196	69	50-75% Grass cover, Fair, HSG B (PRDA#4, PRDA#5)
168,062	61	>75% Grass cover, Good, HSG B (PRDA#1, PRDA#2, PRDA#3)
5,604	98	Paved parking, HSG B (PRDA#1, PRDA#2, PRDA#4)
11,468	98	Unconnected pavement, HSG B (PRDA#3, PRDA#5)
517	98	Unconnected roofs, HSG B (PRDA#2, PRDA#3)
194,847	**65**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
194,847	HSG B	PRDA#1, PRDA#2, PRDA#3, PRDA#4, PRDA#5
0	HSG C	
0	HSG D	
0	Other	
194,847		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	9,196	0	0	0	9,196	50-75% Grass cover, Fair	
0	168,062	0	0	0	168,062	>75% Grass cover, Good	
0	5,604	0	0	0	5,604	Paved parking	
0	11,468	0	0	0	11,468	Unconnected pavement	
0	517	0	0	0	517	Unconnected roofs	
0	**194,847**	**0**	**0**	**0**	**194,847**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPRDA#1: PR DA#1 Runoff Area=55,666 sf 5.45% Impervious Runoff Depth>0.50"
Tc=6.0 min CN=63 Runoff=0.68 cfs 2,310 cf

SubcatchmentPRDA#2: PR DA#2 Runoff Area=28,819 sf 5.92% Impervious Runoff Depth>0.50"
Tc=6.0 min CN=63 Runoff=0.35 cfs 1,196 cf

SubcatchmentPRDA#3: PR DA#3 Runoff Area=93,806 sf 5.85% Impervious Runoff Depth>0.46"
Tc=6.0 min UI Adjusted CN=62 Runoff=1.03 cfs 3,600 cf

SubcatchmentPRDA#4: PR DA#4 Runoff Area=8,931 sf 13.20% Impervious Runoff Depth>0.92"
Tc=60.0 min CN=73 Runoff=0.09 cfs 688 cf

SubcatchmentPRDA#5: PR DA#5 Runoff Area=7,625 sf 81.06% Impervious Runoff Depth>2.39"
Tc=6.0 min CN=93 Runoff=0.48 cfs 1,521 cf

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND) Inflow=0.68 cfs 2,310 cf
Outflow=0.68 cfs 2,310 cf

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND) Inflow=0.35 cfs 1,196 cf
Outflow=0.35 cfs 1,196 cf

Reach PRDP#3: PRDR #3 (OFFSITE) Inflow=0.48 cfs 1,521 cf
Outflow=0.48 cfs 1,521 cf

Reach PRDP#4: PRDP#4 CULVERT Inflow=1.52 cfs 5,027 cf
Outflow=1.52 cfs 5,027 cf

Pond 12P: Recharge Peak Elev=46.34' Storage=1,159 cf Inflow=1.03 cfs 3,600 cf
Discarded=0.13 cfs 3,573 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.13 cfs 3,573 cf

Pond 15P: Porous Peak Elev=44.45' Storage=87 cf Inflow=0.09 cfs 688 cf
Discarded=0.05 cfs 687 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 687 cf

Total Runoff Area = 194,847 sf Runoff Volume = 9,315 cf Average Runoff Depth = 0.57"
90.97% Pervious = 177,258 sf 9.03% Impervious = 17,589 sf

Summary for Subcatchment PRDA#1: PR DA#1

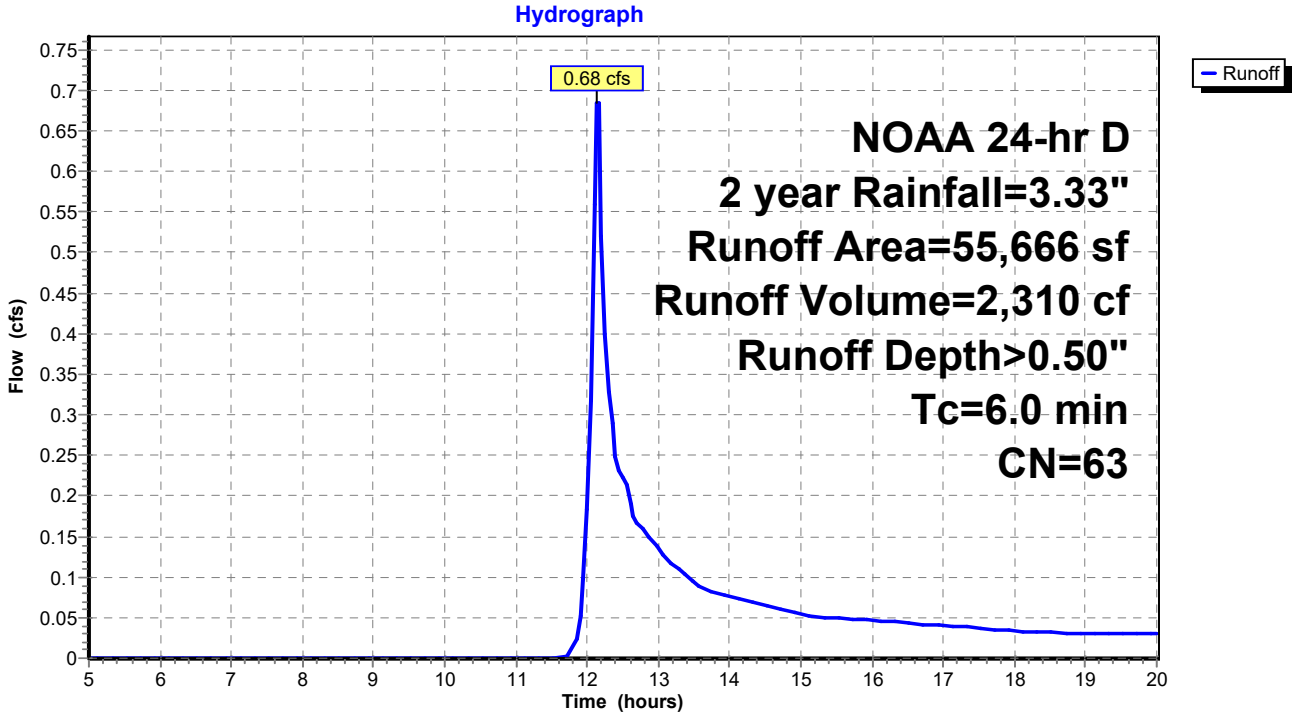
Runoff = 0.68 cfs @ 12.15 hrs, Volume= 2,310 cf, Depth> 0.50"
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Description
3,034	98	Paved parking, HSG B
52,632	61	>75% Grass cover, Good, HSG B
55,666	63	Weighted Average
52,632		94.55% Pervious Area
3,034		5.45% Impervious Area

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

Subcatchment PRDA#1: PR DA#1



Summary for Subcatchment PRDA#2: PR DA#2

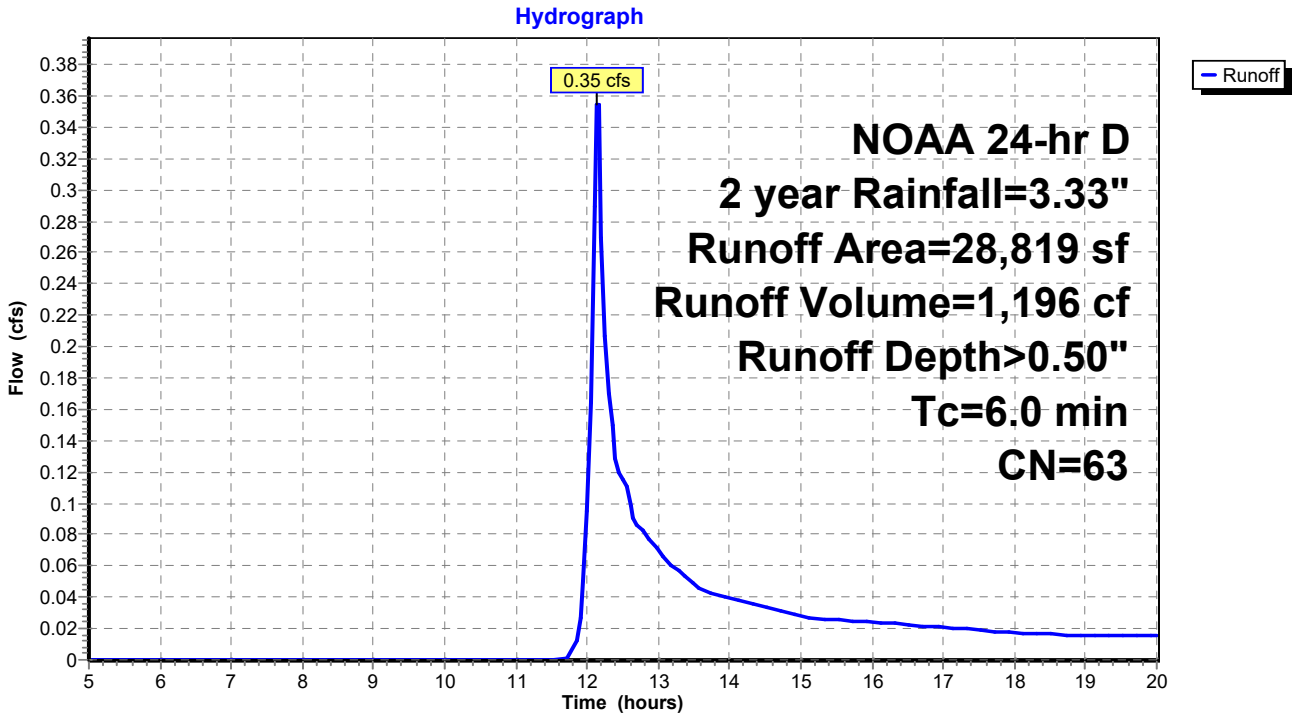
Runoff = 0.35 cfs @ 12.15 hrs, Volume= 1,196 cf, Depth> 0.50"
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Description
27,114	61	>75% Grass cover, Good, HSG B
314	98	Unconnected roofs, HSG B
1,391	98	Paved parking, HSG B
28,819	63	Weighted Average
27,114		94.08% Pervious Area
1,705		5.92% Impervious Area
314		18.42% Unconnected

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

Subcatchment PRDA#2: PR DA#2



Summary for Subcatchment PRDA#3: PR DA#3

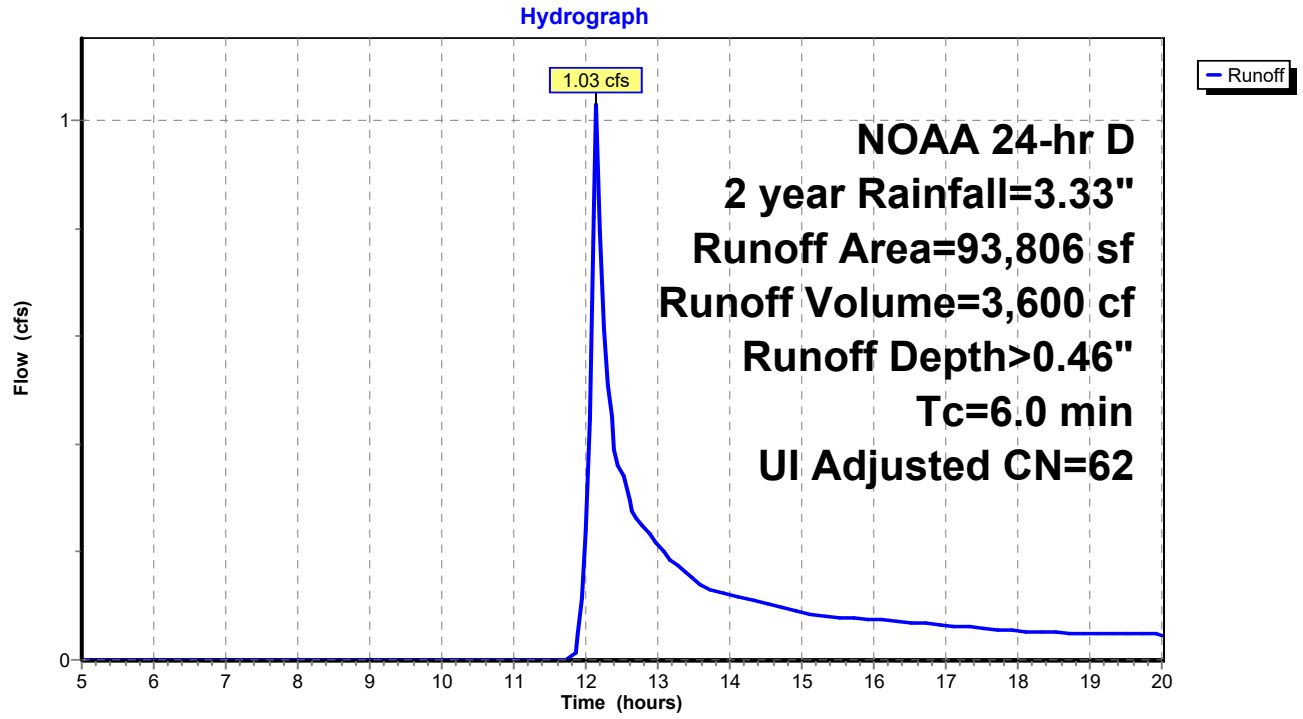
Runoff = 1.03 cfs @ 12.15 hrs, Volume= 3,600 cf, Depth> 0.46"
Routed to Pond 12P : Recharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Adj	Description
5,287	98		Unconnected pavement, HSG B
88,316	61		>75% Grass cover, Good, HSG B
203	98		Unconnected roofs, HSG B
93,806	63	62	Weighted Average, UI Adjusted
88,316			94.15% Pervious Area
5,490			5.85% Impervious Area
5,490			100.00% Unconnected

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

Subcatchment PRDA#3: PR DA#3



Summary for Subcatchment PRDA#4: PR DA#4

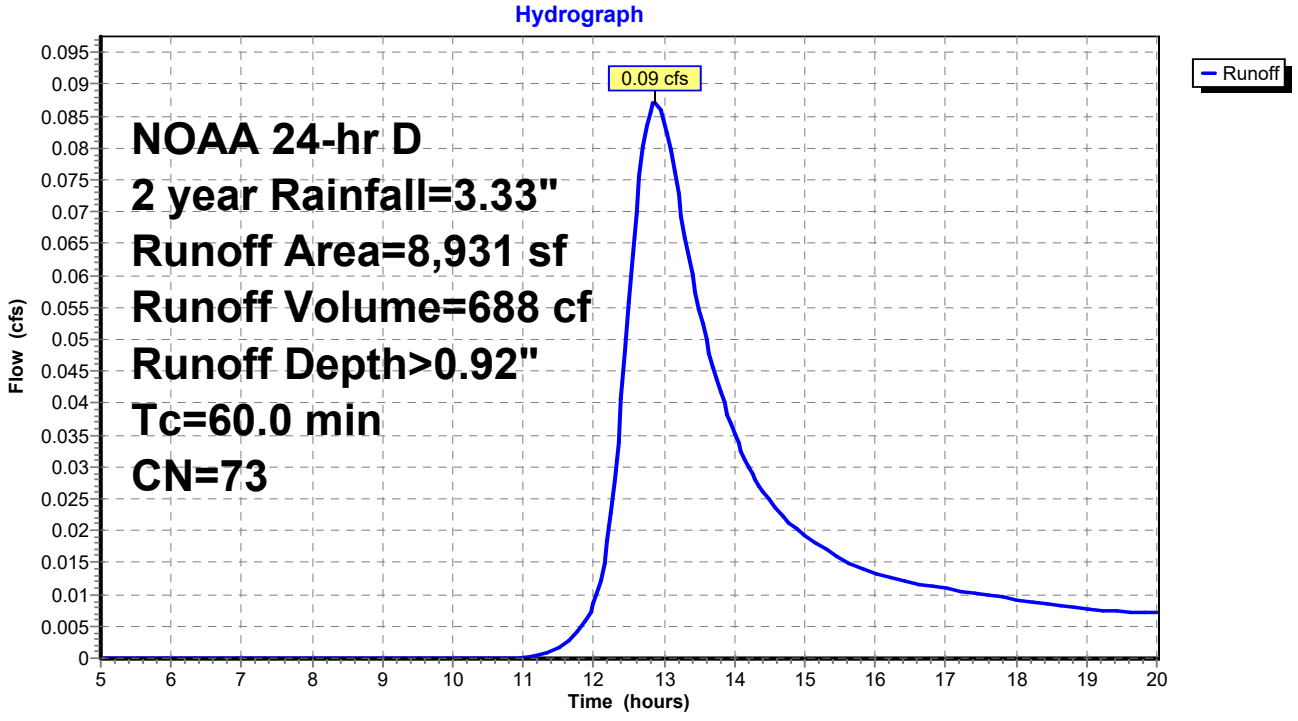
Runoff = 0.09 cfs @ 12.88 hrs, Volume= 688 cf, Depth> 0.92"
Routed to Pond 15P : Porous

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Description
1,179	98	Paved parking, HSG B
7,752	69	50-75% Grass cover, Fair, HSG B
8,931	73	Weighted Average
7,752		86.80% Pervious Area
1,179		13.20% Impervious Area

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

Subcatchment PRDA#4: PR DA#4



Summary for Subcatchment PRDA#5: PR DA#5

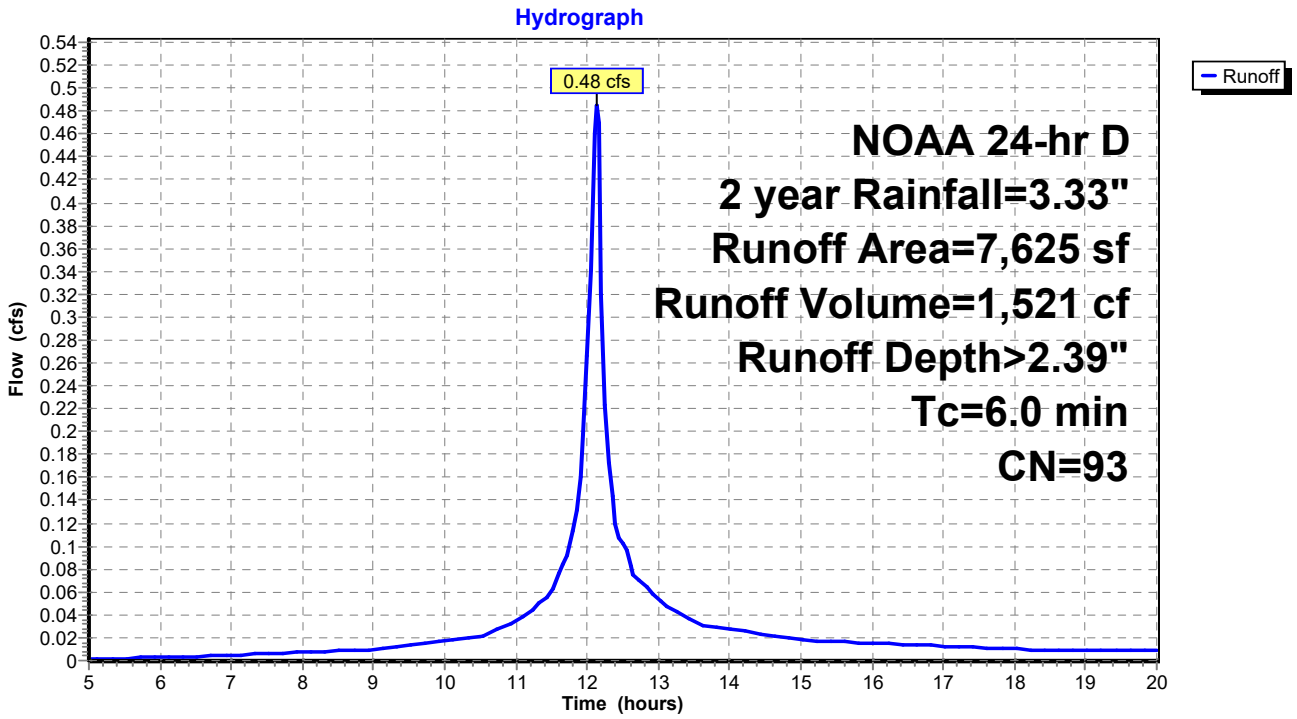
Runoff = 0.48 cfs @ 12.13 hrs, Volume= 1,521 cf, Depth> 2.39"
Routed to Reach PRDP#3 : PRDR #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 2 year Rainfall=3.33"

Area (sf)	CN	Description
6,181	98	Unconnected pavement, HSG B
1,444	69	50-75% Grass cover, Fair, HSG B
7,625	93	Weighted Average
1,444		18.94% Pervious Area
6,181		81.06% Impervious Area
6,181		100.00% Unconnected

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

Subcatchment PRDA#5: PR DA#5

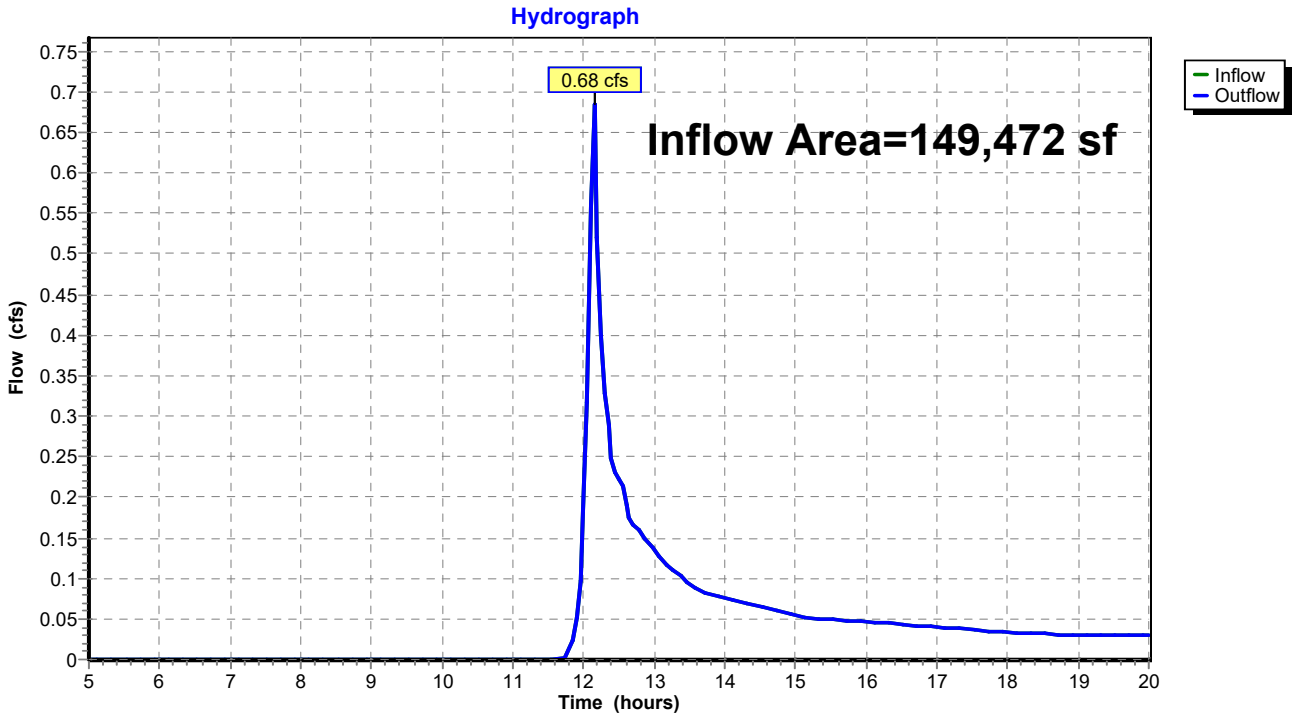


Summary for Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

Inflow Area = 149,472 sf, 5.70% Impervious, Inflow Depth > 0.19" for 2 year event
Inflow = 0.68 cfs @ 12.15 hrs, Volume= 2,310 cf
Outflow = 0.68 cfs @ 12.15 hrs, Volume= 2,310 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

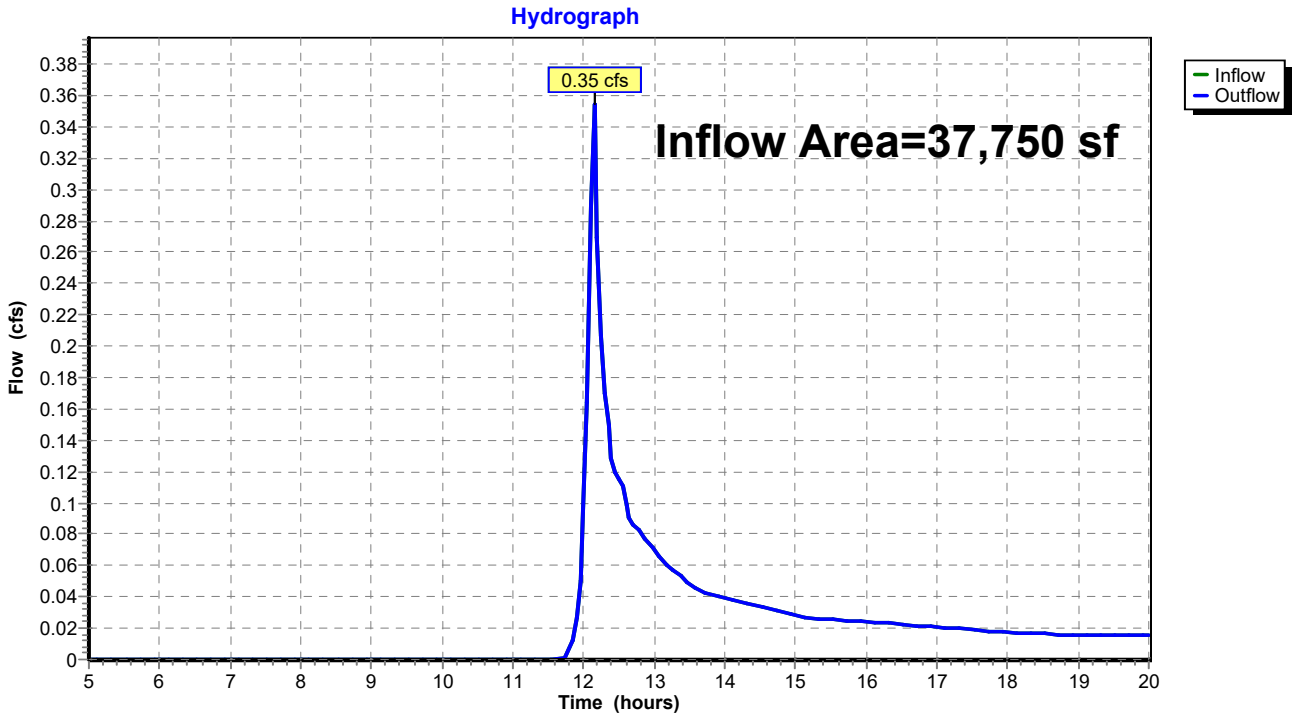


Summary for Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

Inflow Area = 37,750 sf, 7.64% Impervious, Inflow Depth > 0.38" for 2 year event
Inflow = 0.35 cfs @ 12.15 hrs, Volume= 1,196 cf
Outflow = 0.35 cfs @ 12.15 hrs, Volume= 1,196 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

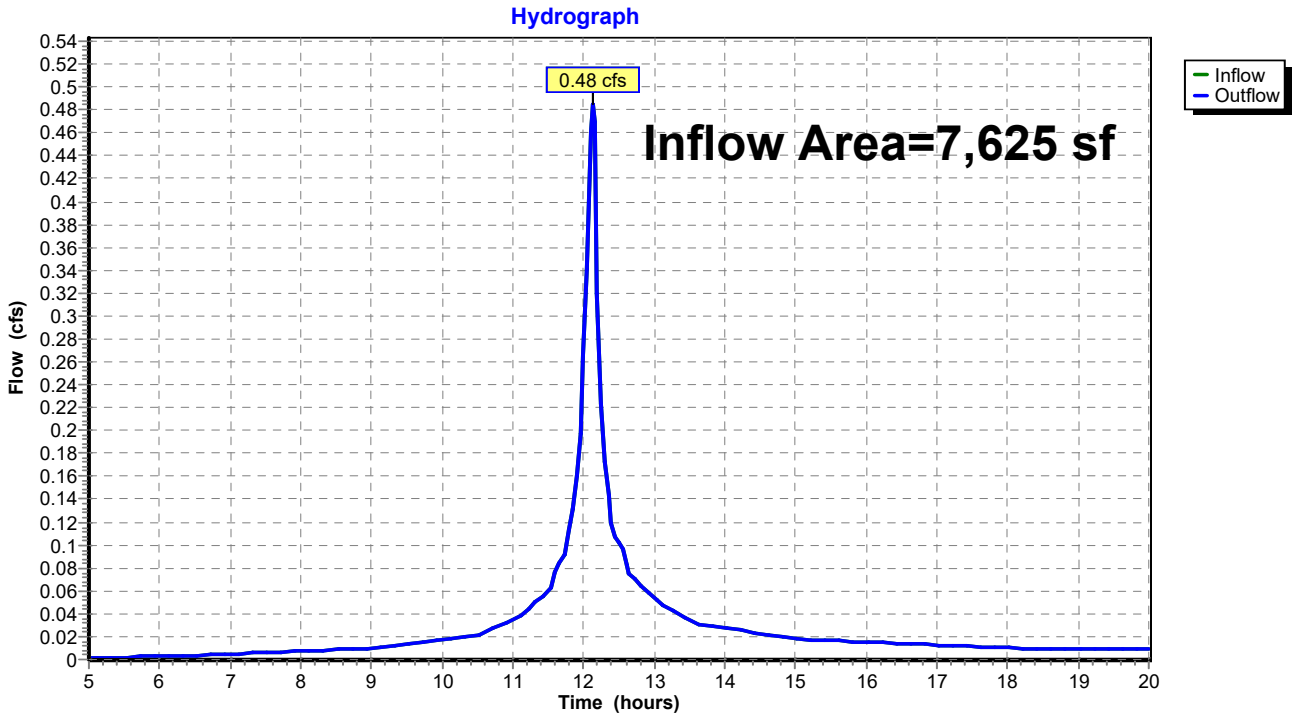


Summary for Reach PRDP#3: PRDR #3 (OFFSITE)

Inflow Area = 7,625 sf, 81.06% Impervious, Inflow Depth > 2.39" for 2 year event
Inflow = 0.48 cfs @ 12.13 hrs, Volume= 1,521 cf
Outflow = 0.48 cfs @ 12.13 hrs, Volume= 1,521 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#3: PRDR #3 (OFFSITE)

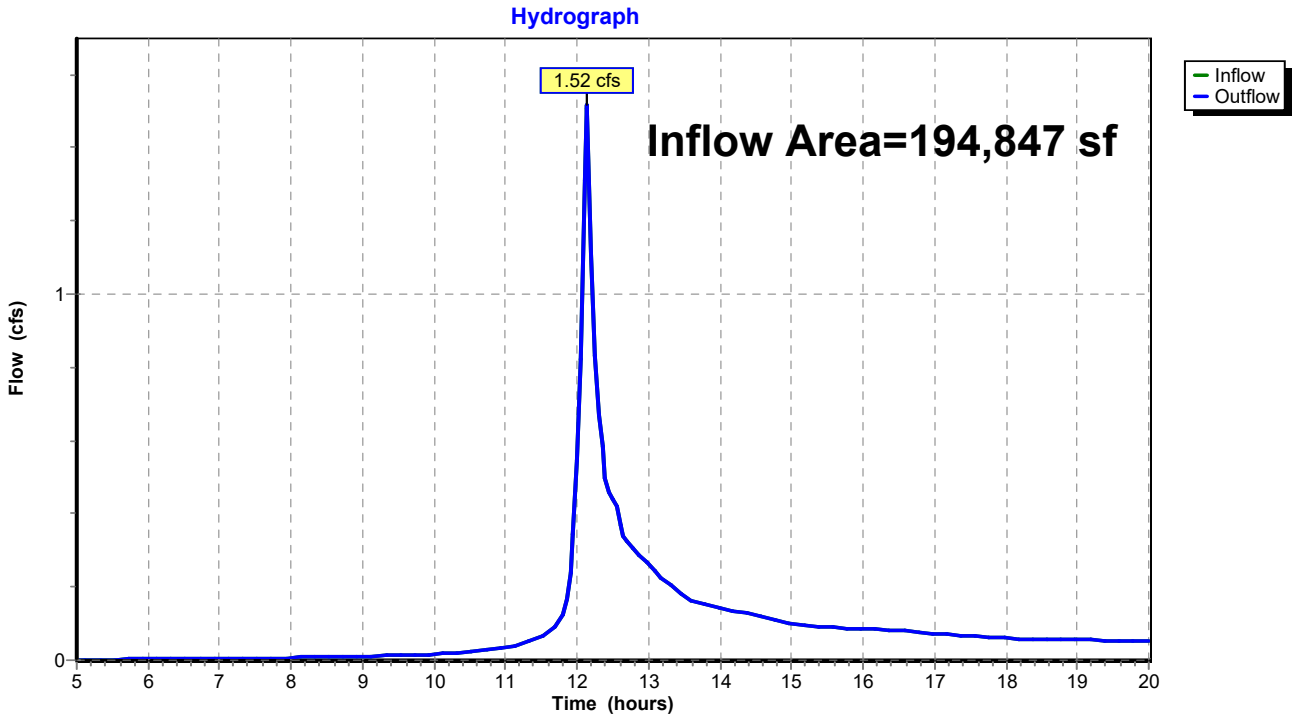


Summary for Reach PRDP#4: PRDP#4 CULVERT

Inflow Area = 194,847 sf, 9.03% Impervious, Inflow Depth > 0.31" for 2 year event
Inflow = 1.52 cfs @ 12.14 hrs, Volume= 5,027 cf
Outflow = 1.52 cfs @ 12.14 hrs, Volume= 5,027 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#4: PRDP#4 CULVERT



Summary for Pond 12P: Recharge

Inflow Area = 93,806 sf, 5.85% Impervious, Inflow Depth > 0.46" for 2 year event
Inflow = 1.03 cfs @ 12.15 hrs, Volume= 3,600 cf
Outflow = 0.13 cfs @ 12.05 hrs, Volume= 3,573 cf, Atten= 87%, Lag= 0.0 min
Discarded = 0.13 cfs @ 12.05 hrs, Volume= 3,573 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.34' @ 13.65 hrs Surf.Area= 5,610 sf Storage= 1,159 cf

Plug-Flow detention time= 91.7 min calculated for 3,573 cf (99% of inflow)
Center-of-Mass det. time= 89.1 min (944.5 - 855.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	45.60'	4,862 cf	**5.50'W x 1,020.00'L x 4.50'H Field A** 25,245 cf Overall - 9,038 cf Embedded = 16,207 cf x 30.0% Voids
#2A	46.10'	7,242 cf	**ADS N-12 36"** Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows
#3	47.00'	15 cf	**1.0" Round Pipe Storage** L= 2,830.0' S= 0.0010 '/'
		12,119 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	46.80'	**24.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	47.20'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Discarded	45.60'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 12.05 hrs HW=45.65' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.60' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.60' (Free Discharge)
├**2=Orifice/Grate** (Controls 0.00 cfs)
├**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 12P: Recharge - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows

1 Chambers/Row x 20.00' Long +1,000.00' Row Adjustment = 1,020.00' Row Length
1 Rows x 42.0" Wide + 12.0" Side Stone x 2 = 5.50' Base Width
6.0" Stone Base + 42.0" Chamber Height + 6.0" Stone Cover = 4.50' Field Height

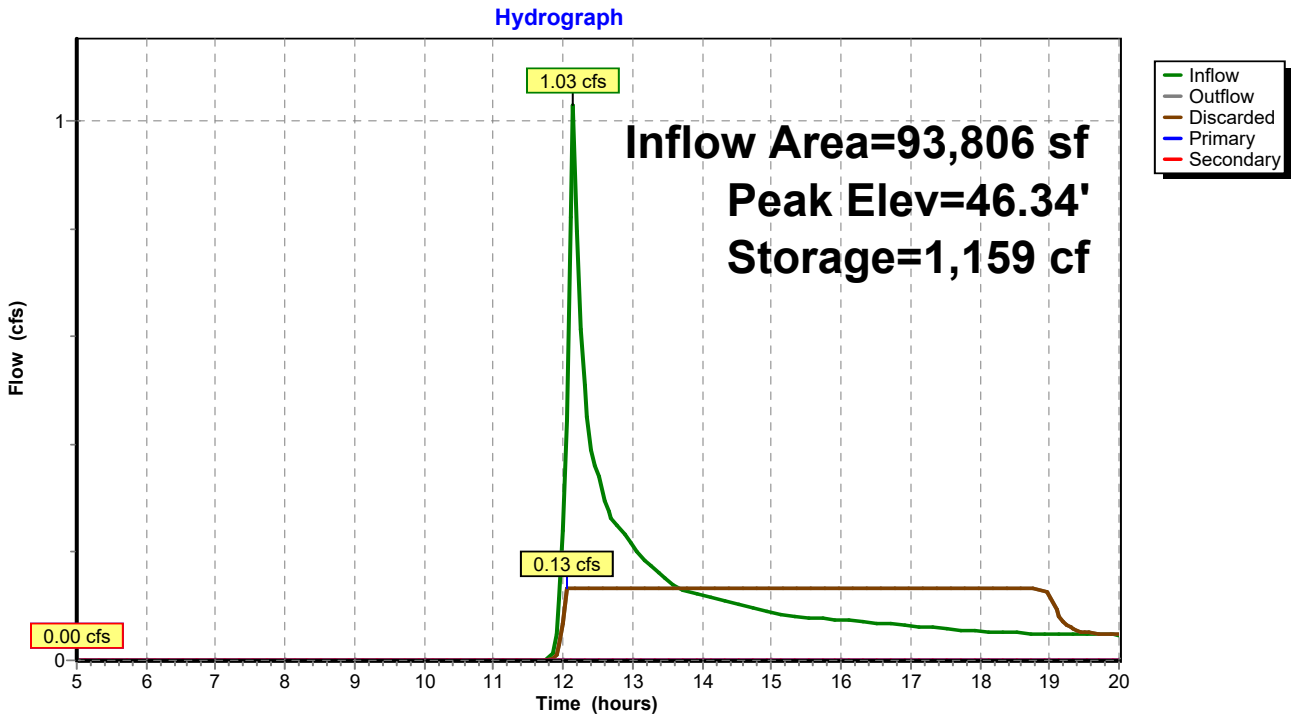
1 Chambers x 142.0 cf +1,000.00' Row Adjustment x 7.10 sf x 1 Rows = 7,242.0 cf Chamber Storage
1 Chambers x 177.1 cf +1,000.00' Row Adjustment x 8.86 sf x 1 Rows = 9,034.4 cf Displacement

25,244.9 cf Field - 9,034.4 cf Chambers = 16,210.5 cf Stone x 30.0% Voids = 4,863.2 cf Stone Storage

Chamber Storage + Stone Storage = 12,105.2 cf = 0.278 af
Overall Storage Efficiency = 48.0%
Overall System Size = 1,020.00' x 5.50' x 4.50'

1 Chambers
935.0 cy Field
600.4 cy Stone

Pond 12P: Recharge



Summary for Pond 15P: Porous

Inflow Area = 8,931 sf, 13.20% Impervious, Inflow Depth > 0.92" for 2 year event
Inflow = 0.09 cfs @ 12.88 hrs, Volume= 688 cf
Outflow = 0.05 cfs @ 12.55 hrs, Volume= 687 cf, Atten= 40%, Lag= 0.0 min
Discarded = 0.05 cfs @ 12.55 hrs, Volume= 687 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 44.45' @ 13.56 hrs Surf.Area= 2,201 sf Storage= 87 cf

Plug-Flow detention time= 11.7 min calculated for 685 cf (100% of inflow)
Center-of-Mass det. time= 11.2 min (873.1 - 861.9)

Volume	Invert	Avail.Storage	Storage Description
#1	44.83'	18 cf	**6.0" Round Pipe Storage** L= 90.0' S= 0.0050 '/'
#2	44.32'	1,508 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		1,525 cf	Total Available Storage

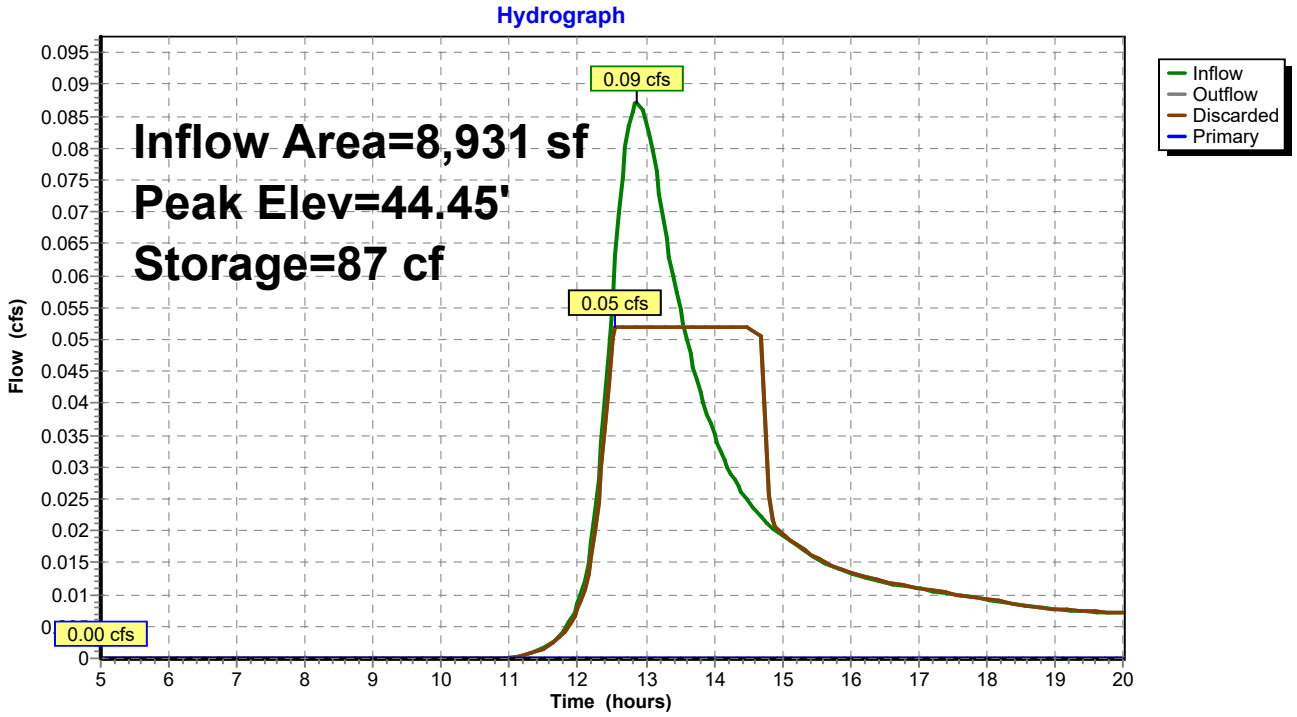
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.32	2,201	0.0	0	0
44.33	2,201	30.0	7	7
45.33	2,201	30.0	660	667
47.24	2,201	20.0	841	1,508

Device	Routing	Invert	Outlet Devices
#1	Primary	45.33'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	44.32'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.55 hrs HW=44.33' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.32' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: Porous



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPRDA#1: PR DA#1 Runoff Area=55,666 sf 5.45% Impervious Runoff Depth>0.99"
Tc=6.0 min CN=63 Runoff=1.53 cfs 4,605 cf

SubcatchmentPRDA#2: PR DA#2 Runoff Area=28,819 sf 5.92% Impervious Runoff Depth>0.99"
Tc=6.0 min CN=63 Runoff=0.79 cfs 2,384 cf

SubcatchmentPRDA#3: PR DA#3 Runoff Area=93,806 sf 5.85% Impervious Runoff Depth>0.94"
Tc=6.0 min UI Adjusted CN=62 Runoff=2.41 cfs 7,325 cf

SubcatchmentPRDA#4: PR DA#4 Runoff Area=8,931 sf 13.20% Impervious Runoff Depth>1.58"
Tc=60.0 min CN=73 Runoff=0.15 cfs 1,179 cf

SubcatchmentPRDA#5: PR DA#5 Runoff Area=7,625 sf 81.06% Impervious Runoff Depth>3.33"
Tc=6.0 min CN=93 Runoff=0.66 cfs 2,116 cf

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND) Inflow=1.53 cfs 4,605 cf
Outflow=1.53 cfs 4,605 cf

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND) Inflow=0.79 cfs 3,886 cf
Outflow=0.79 cfs 3,886 cf

Reach PRDP#3: PRDR #3 (OFFSITE) Inflow=0.66 cfs 2,116 cf
Outflow=0.66 cfs 2,116 cf

Reach PRDP#4: PRDP#4 CULVERT Inflow=2.98 cfs 10,607 cf
Outflow=2.98 cfs 10,607 cf

Pond 12P: Recharge Peak Elev=46.92' Storage=2,711 cf Inflow=2.41 cfs 7,325 cf
Discarded=0.13 cfs 3,990 cf Primary=0.00 cfs 0 cf Secondary=0.28 cfs 1,501 cf Outflow=0.41 cfs 5,491 cf

Pond 15P: Porous Peak Elev=44.84' Storage=344 cf Inflow=0.15 cfs 1,179 cf
Discarded=0.05 cfs 1,177 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 1,177 cf

Total Runoff Area = 194,847 sf Runoff Volume = 17,610 cf Average Runoff Depth = 1.08"
90.97% Pervious = 177,258 sf 9.03% Impervious = 17,589 sf

Summary for Subcatchment PRDA#1: PR DA#1

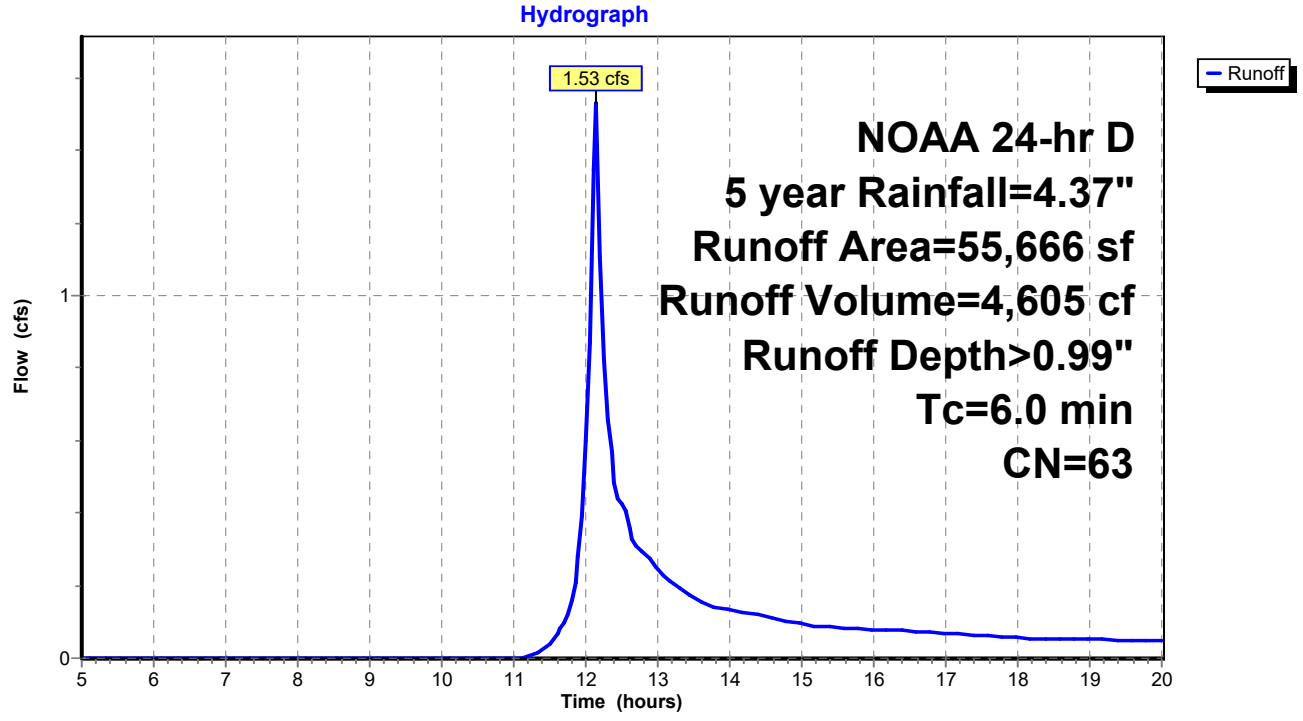
Runoff = 1.53 cfs @ 12.14 hrs, Volume= 4,605 cf, Depth> 0.99"
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Description
3,034	98	Paved parking, HSG B
52,632	61	>75% Grass cover, Good, HSG B
55,666	63	Weighted Average
52,632		94.55% Pervious Area
3,034		5.45% Impervious Area

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

Subcatchment PRDA#1: PR DA#1



Summary for Subcatchment PRDA#2: PR DA#2

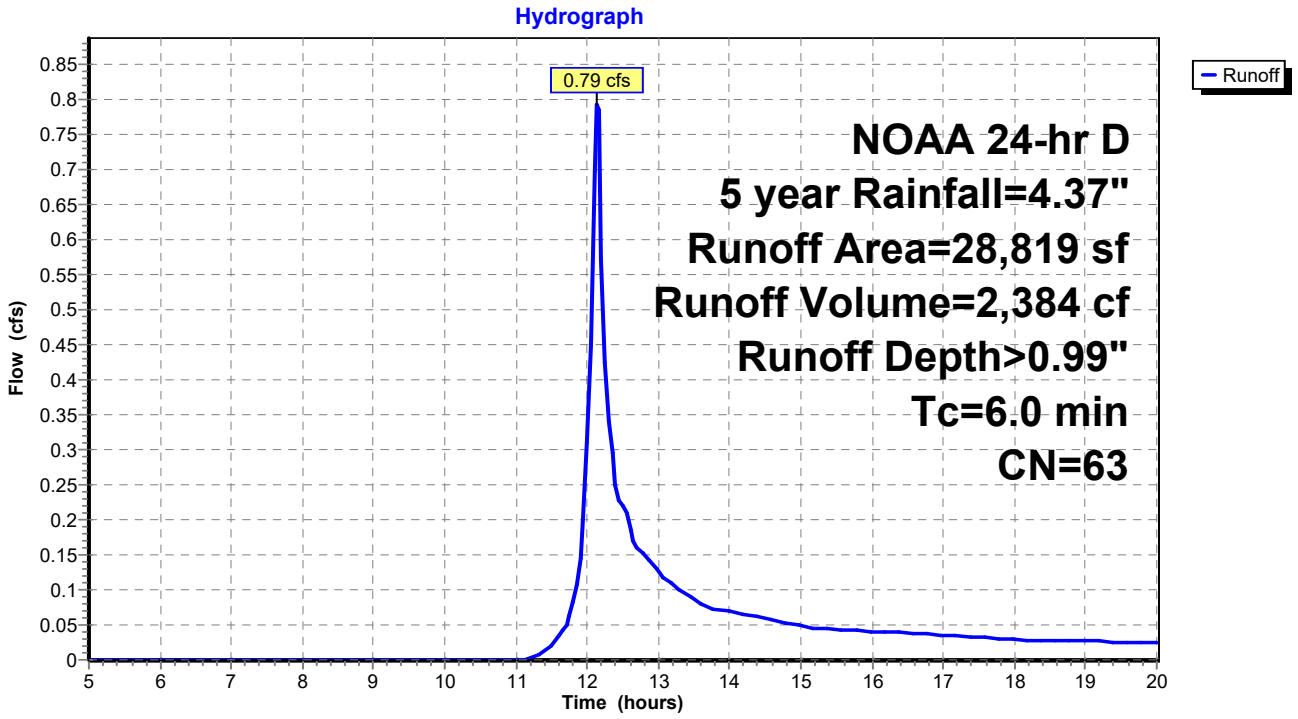
Runoff = 0.79 cfs @ 12.14 hrs, Volume= 2,384 cf, Depth> 0.99"
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Description
27,114	61	>75% Grass cover, Good, HSG B
314	98	Unconnected roofs, HSG B
1,391	98	Paved parking, HSG B
28,819	63	Weighted Average
27,114		94.08% Pervious Area
1,705		5.92% Impervious Area
314		18.42% Unconnected

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

Subcatchment PRDA#2: PR DA#2



Summary for Subcatchment PRDA#3: PR DA#3

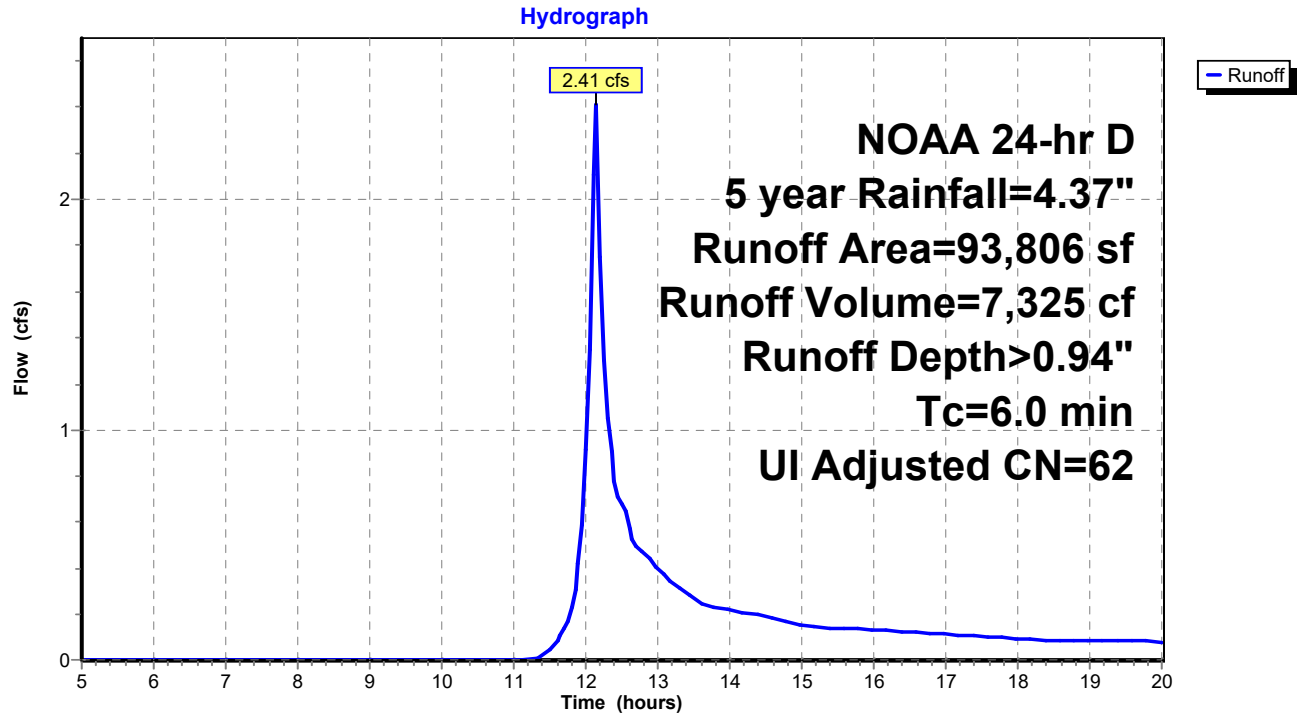
Runoff = 2.41 cfs @ 12.14 hrs, Volume= 7,325 cf, Depth> 0.94"
Routed to Pond 12P : Recharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Adj	Description
5,287	98		Unconnected pavement, HSG B
88,316	61		>75% Grass cover, Good, HSG B
203	98		Unconnected roofs, HSG B
93,806	63	62	Weighted Average, UI Adjusted
88,316			94.15% Pervious Area
5,490			5.85% Impervious Area
5,490			100.00% Unconnected

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

Subcatchment PRDA#3: PR DA#3



Summary for Subcatchment PRDA#4: PR DA#4

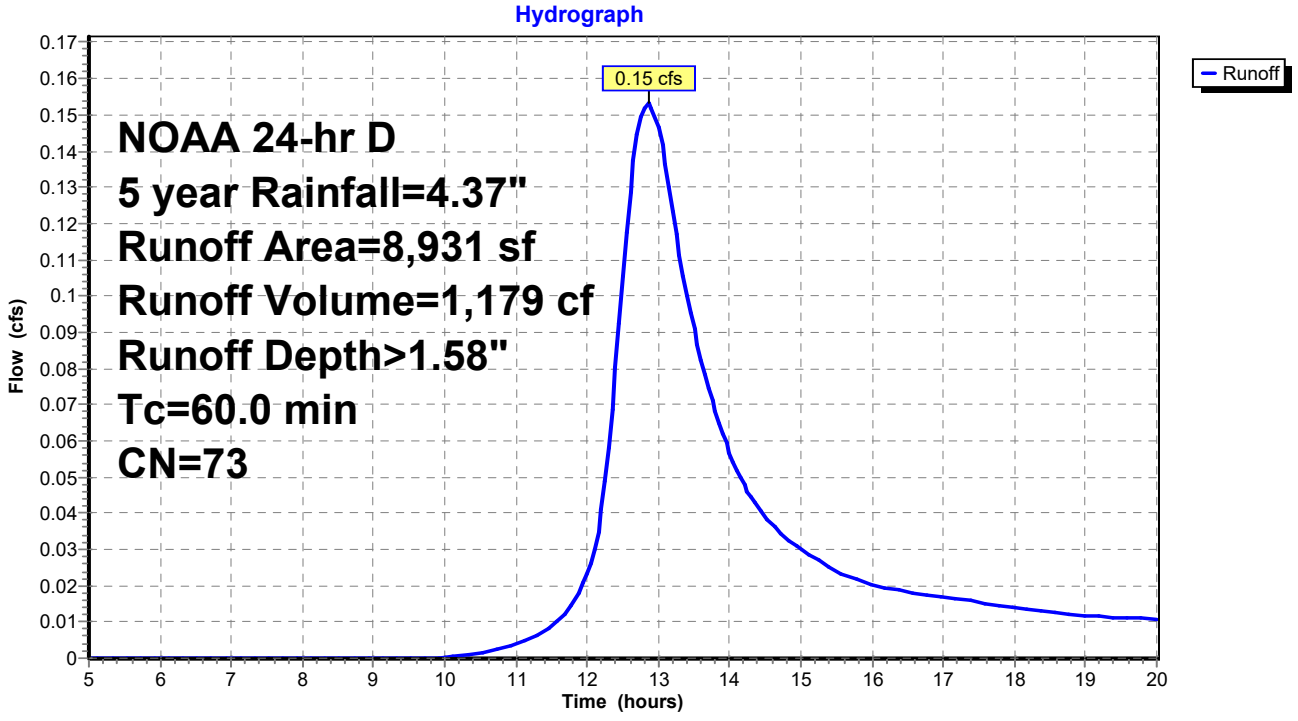
Runoff = 0.15 cfs @ 12.85 hrs, Volume= 1,179 cf, Depth> 1.58"
Routed to Pond 15P : Porous

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Description
1,179	98	Paved parking, HSG B
7,752	69	50-75% Grass cover, Fair, HSG B
8,931	73	Weighted Average
7,752		86.80% Pervious Area
1,179		13.20% Impervious Area

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

Subcatchment PRDA#4: PR DA#4



Summary for Subcatchment PRDA#5: PR DA#5

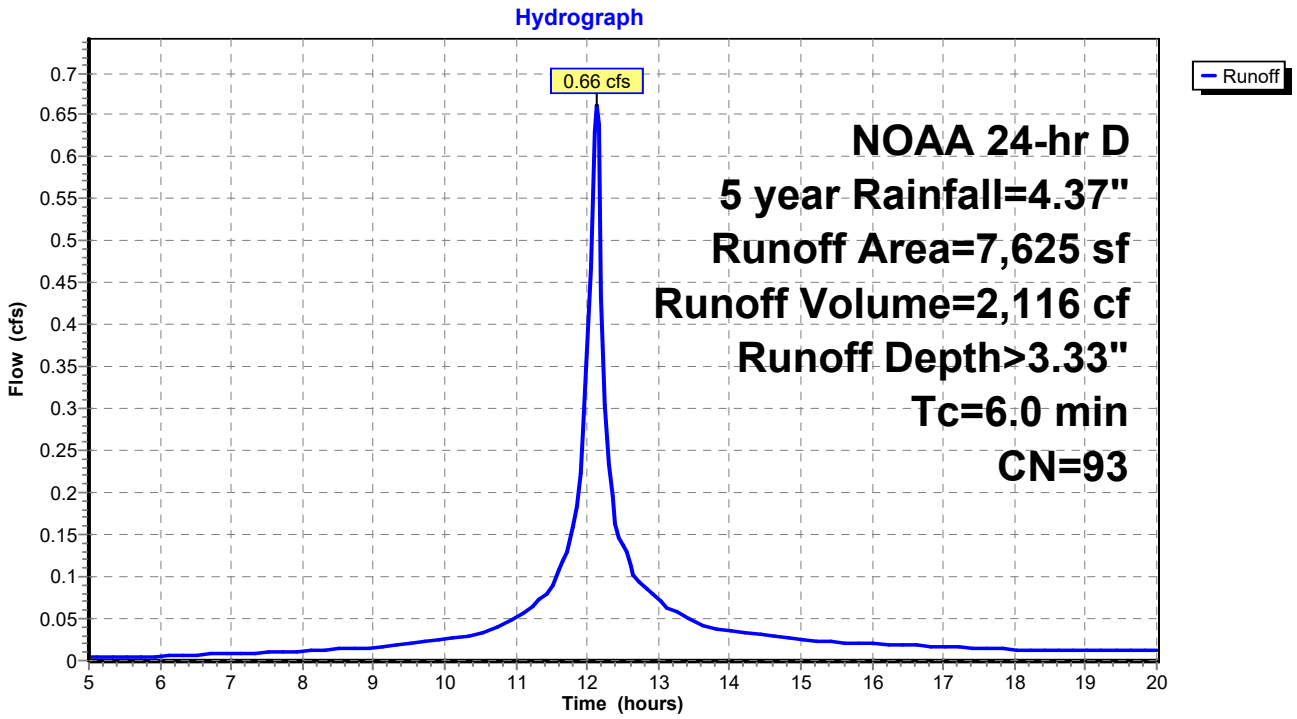
Runoff = 0.66 cfs @ 12.13 hrs, Volume= 2,116 cf, Depth> 3.33"
Routed to Reach PRDP#3 : PRDR #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 5 year Rainfall=4.37"

Area (sf)	CN	Description
6,181	98	Unconnected pavement, HSG B
1,444	69	50-75% Grass cover, Fair, HSG B
7,625	93	Weighted Average
1,444		18.94% Pervious Area
6,181		81.06% Impervious Area
6,181		100.00% Unconnected

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

Subcatchment PRDA#5: PR DA#5

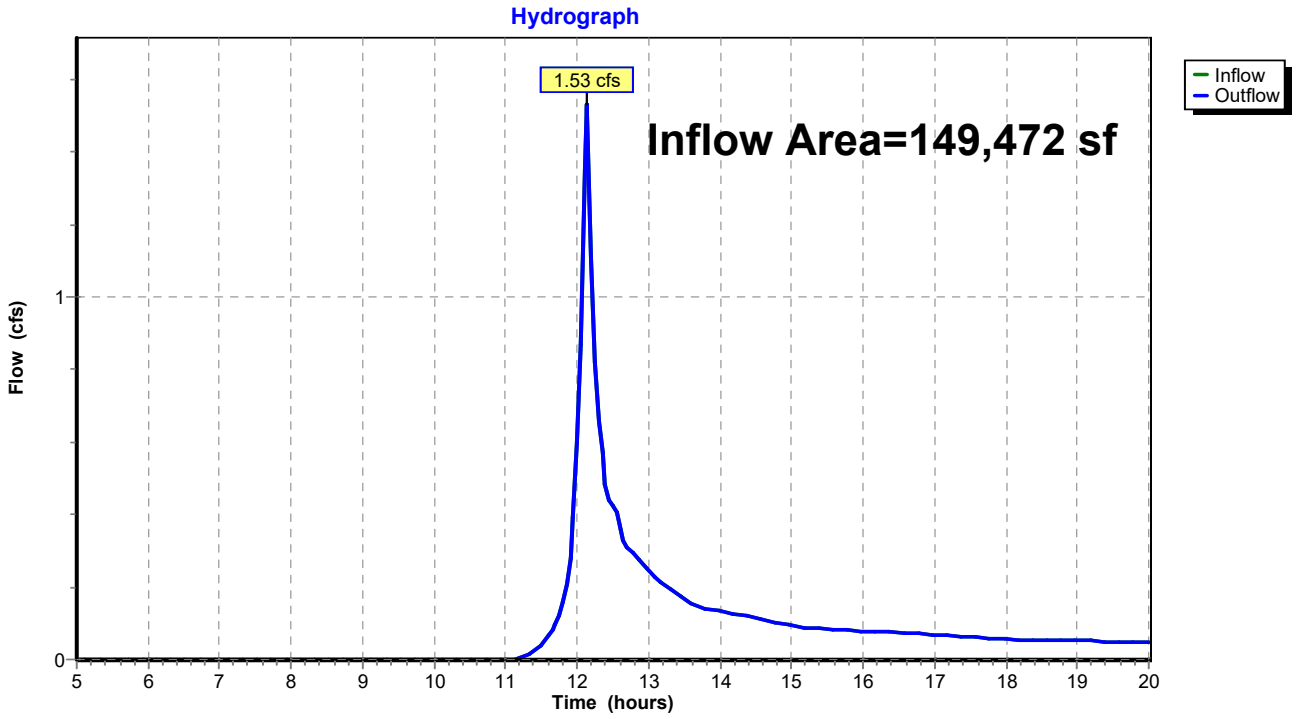


Summary for Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

Inflow Area = 149,472 sf, 5.70% Impervious, Inflow Depth > 0.37" for 5 year event
Inflow = 1.53 cfs @ 12.14 hrs, Volume= 4,605 cf
Outflow = 1.53 cfs @ 12.14 hrs, Volume= 4,605 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

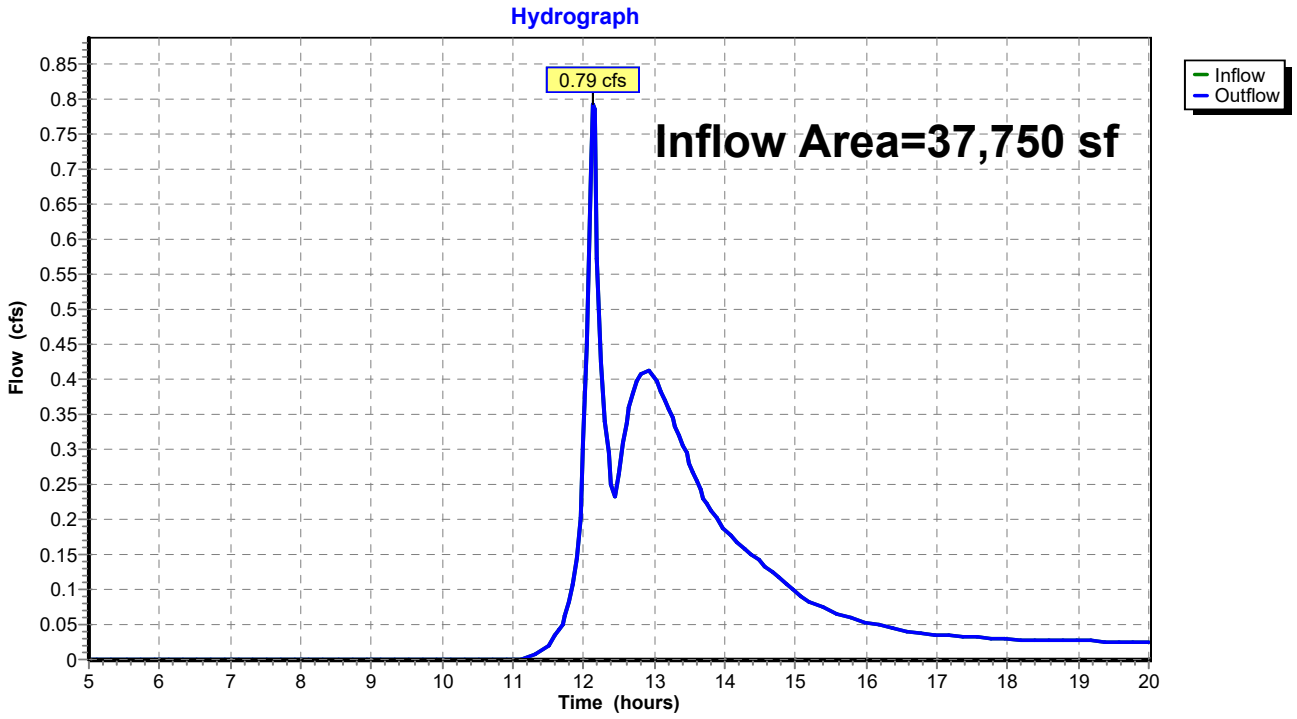


Summary for Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

Inflow Area = 37,750 sf, 7.64% Impervious, Inflow Depth > 1.24" for 5 year event
Inflow = 0.79 cfs @ 12.14 hrs, Volume= 3,886 cf
Outflow = 0.79 cfs @ 12.14 hrs, Volume= 3,886 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

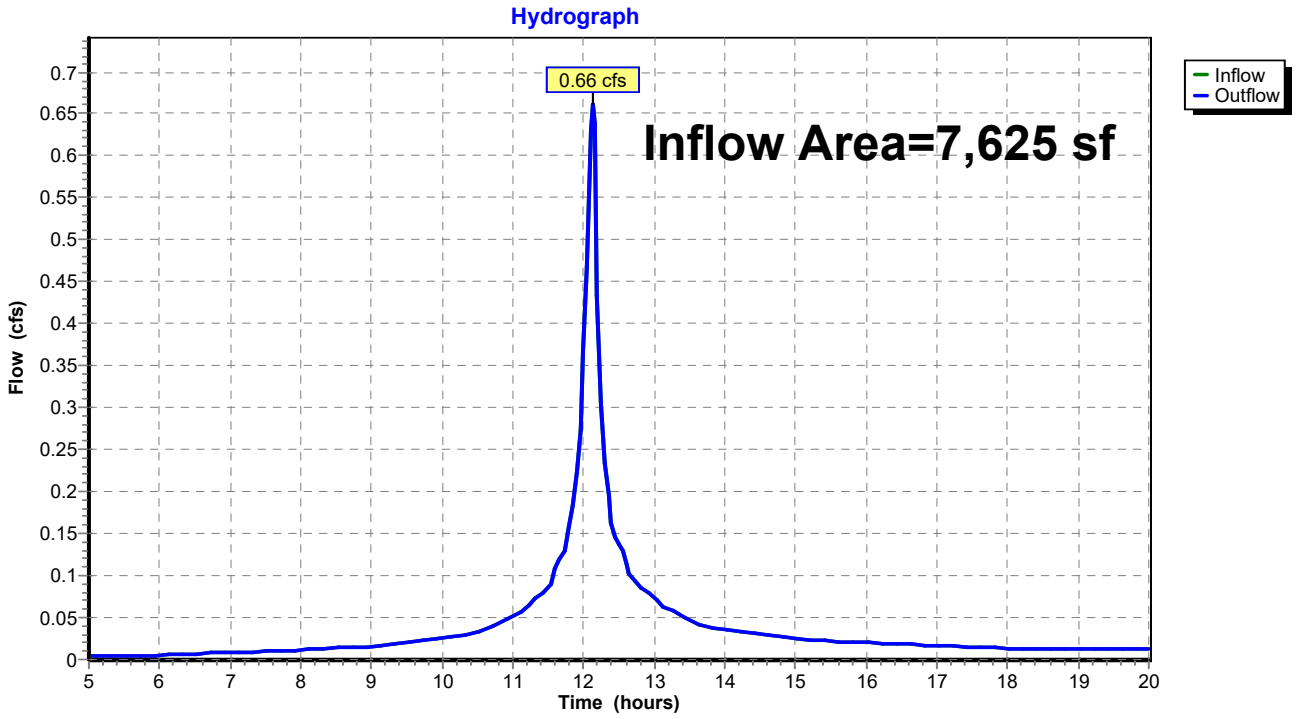


Summary for Reach PRDP#3: PRDR #3 (OFFSITE)

Inflow Area = 7,625 sf, 81.06% Impervious, Inflow Depth > 3.33" for 5 year event
Inflow = 0.66 cfs @ 12.13 hrs, Volume= 2,116 cf
Outflow = 0.66 cfs @ 12.13 hrs, Volume= 2,116 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#3: PRDR #3 (OFFSITE)

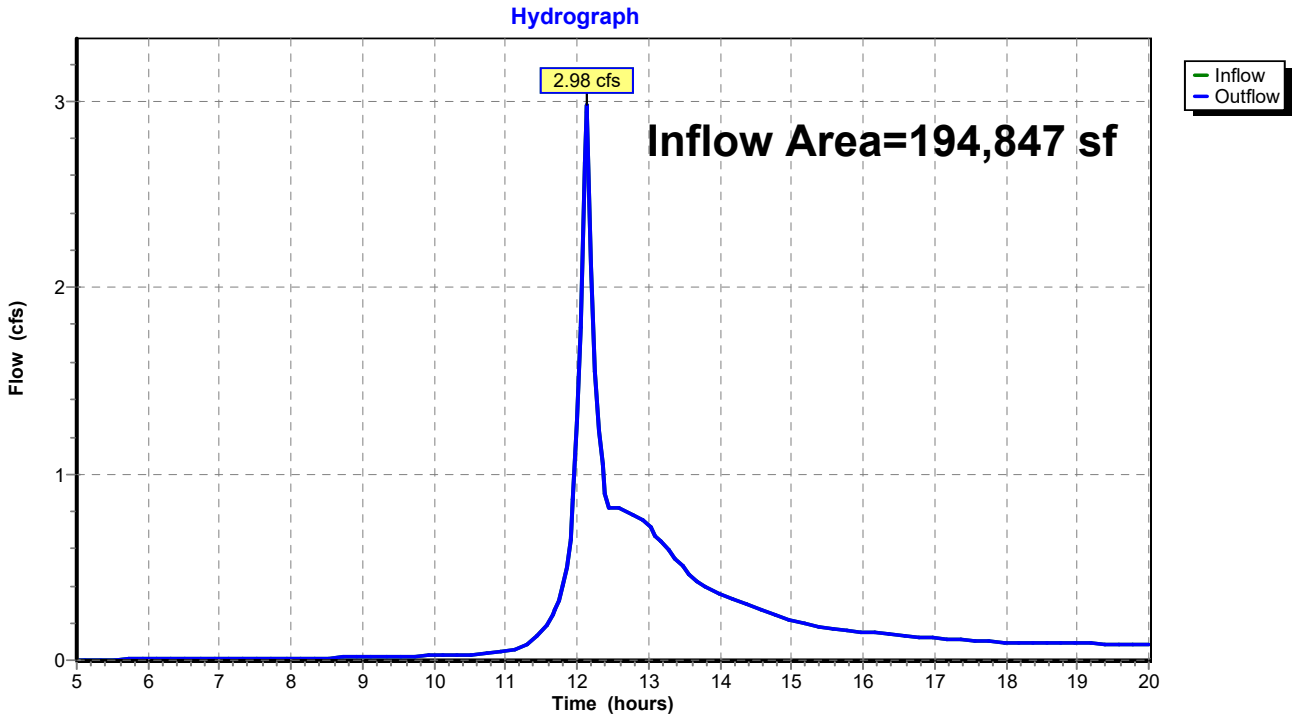


Summary for Reach PRDP#4: PRDP#4 CULVERT

Inflow Area = 194,847 sf, 9.03% Impervious, Inflow Depth > 0.65" for 5 year event
Inflow = 2.98 cfs @ 12.14 hrs, Volume= 10,607 cf
Outflow = 2.98 cfs @ 12.14 hrs, Volume= 10,607 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#4: PRDP#4 CULVERT



Summary for Pond 12P: Recharge

Inflow Area = 93,806 sf, 5.85% Impervious, Inflow Depth > 0.94" for 5 year event
Inflow = 2.41 cfs @ 12.14 hrs, Volume= 7,325 cf
Outflow = 0.41 cfs @ 12.96 hrs, Volume= 5,491 cf, Atten= 83%, Lag= 49.2 min
Discarded = 0.13 cfs @ 11.85 hrs, Volume= 3,990 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)
Secondary = 0.28 cfs @ 12.96 hrs, Volume= 1,501 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.92' @ 12.96 hrs Surf.Area= 5,610 sf Storage= 2,711 cf

Plug-Flow detention time= 145.7 min calculated for 5,491 cf (75% of inflow)
Center-of-Mass det. time= 78.1 min (913.8 - 835.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	45.60'	4,862 cf	**5.50'W x 1,020.00'L x 4.50'H Field A** 25,245 cf Overall - 9,038 cf Embedded = 16,207 cf x 30.0% Voids
#2A	46.10'	7,242 cf	**ADS N-12 36"** Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows
#3	47.00'	15 cf	**1.0" Round Pipe Storage** L= 2,830.0' S= 0.0010 '/'
		12,119 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	46.80'	**24.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	47.20'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Discarded	45.60'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 11.85 hrs HW=45.66' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.60' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.28 cfs @ 12.96 hrs HW=46.92' (Free Discharge)
├**2=Orifice/Grate** (Controls 0.00 cfs)
├**3=Orifice/Grate** (Orifice Controls 0.28 cfs @ 1.13 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 12P: Recharge - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows

1 Chambers/Row x 20.00' Long +1,000.00' Row Adjustment = 1,020.00' Row Length
1 Rows x 42.0" Wide + 12.0" Side Stone x 2 = 5.50' Base Width
6.0" Stone Base + 42.0" Chamber Height + 6.0" Stone Cover = 4.50' Field Height

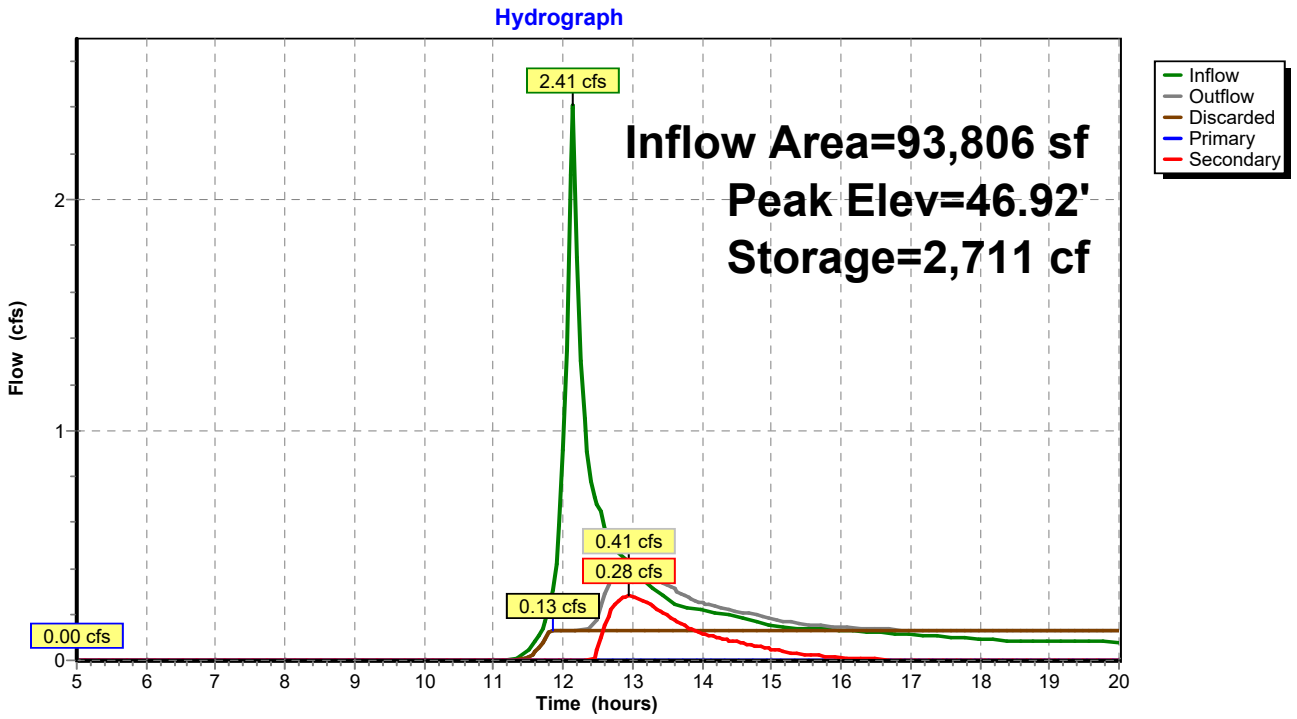
1 Chambers x 142.0 cf +1,000.00' Row Adjustment x 7.10 sf x 1 Rows = 7,242.0 cf Chamber Storage
1 Chambers x 177.1 cf +1,000.00' Row Adjustment x 8.86 sf x 1 Rows = 9,034.4 cf Displacement

25,244.9 cf Field - 9,034.4 cf Chambers = 16,210.5 cf Stone x 30.0% Voids = 4,863.2 cf Stone Storage

Chamber Storage + Stone Storage = 12,105.2 cf = 0.278 af
Overall Storage Efficiency = 48.0%
Overall System Size = 1,020.00' x 5.50' x 4.50'

1 Chambers
935.0 cy Field
600.4 cy Stone

Pond 12P: Recharge



Summary for Pond 15P: Porous

Inflow Area = 8,931 sf, 13.20% Impervious, Inflow Depth > 1.58" for 5 year event
Inflow = 0.15 cfs @ 12.85 hrs, Volume= 1,179 cf
Outflow = 0.05 cfs @ 14.10 hrs, Volume= 1,177 cf, Atten= 66%, Lag= 74.8 min
Discarded = 0.05 cfs @ 14.10 hrs, Volume= 1,177 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 44.84' @ 14.10 hrs Surf.Area= 2,201 sf Storage= 344 cf

Plug-Flow detention time= 56.3 min calculated for 1,177 cf (100% of inflow)
Center-of-Mass det. time= 55.9 min (906.0 - 850.1)

Volume	Invert	Avail.Storage	Storage Description
#1	44.83'	18 cf	**6.0" Round Pipe Storage** L= 90.0' S= 0.0050 '/'
#2	44.32'	1,508 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		1,525 cf	Total Available Storage

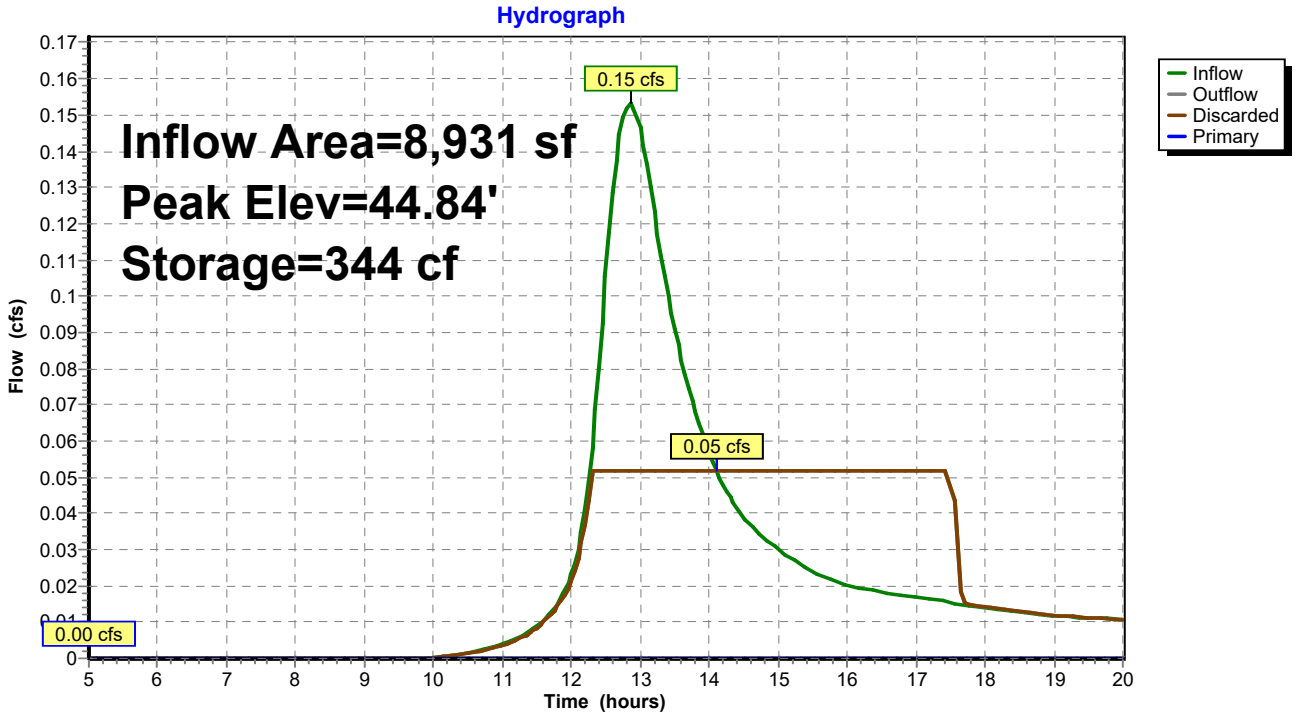
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.32	2,201	0.0	0	0
44.33	2,201	30.0	7	7
45.33	2,201	30.0	660	667
47.24	2,201	20.0	841	1,508

Device	Routing	Invert	Outlet Devices
#1	Primary	45.33'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	44.32'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 14.10 hrs HW=44.84' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.32' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: Porous



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPRDA#1: PR DA#1 Runoff Area=55,666 sf 5.45% Impervious Runoff Depth>1.48"
Tc=6.0 min CN=63 Runoff=2.35 cfs 6,881 cf

SubcatchmentPRDA#2: PR DA#2 Runoff Area=28,819 sf 5.92% Impervious Runoff Depth>1.48"
Tc=6.0 min CN=63 Runoff=1.22 cfs 3,562 cf

SubcatchmentPRDA#3: PR DA#3 Runoff Area=93,806 sf 5.85% Impervious Runoff Depth>1.41"
Tc=6.0 min UI Adjusted CN=62 Runoff=3.76 cfs 11,050 cf

SubcatchmentPRDA#4: PR DA#4 Runoff Area=8,931 sf 13.20% Impervious Runoff Depth>2.19"
Tc=60.0 min CN=73 Runoff=0.21 cfs 1,633 cf

SubcatchmentPRDA#5: PR DA#5 Runoff Area=7,625 sf 81.06% Impervious Runoff Depth>4.12"
Tc=6.0 min CN=93 Runoff=0.81 cfs 2,616 cf

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND) Inflow=2.35 cfs 6,881 cf
Outflow=2.35 cfs 6,881 cf

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND) Inflow=1.22 cfs 8,232 cf
Outflow=1.22 cfs 8,232 cf

Reach PRDP#3: PRDR #3 (OFFSITE) Inflow=0.81 cfs 2,616 cf
Outflow=0.81 cfs 2,616 cf

Reach PRDP#4: PRDP#4 CULVERT Inflow=4.34 cfs 17,729 cf
Outflow=4.34 cfs 17,729 cf

Pond 12P: Recharge Peak Elev=47.14' Storage=3,431 cf Inflow=3.76 cfs 11,050 cf
Discarded=0.13 cfs 4,165 cf Primary=0.00 cfs 0 cf Secondary=0.80 cfs 4,669 cf Outflow=0.94 cfs 8,835 cf

Pond 15P: Porous Peak Elev=45.25' Storage=618 cf Inflow=0.21 cfs 1,633 cf
Discarded=0.05 cfs 1,588 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 1,588 cf

Total Runoff Area = 194,847 sf Runoff Volume = 25,743 cf Average Runoff Depth = 1.59"
90.97% Pervious = 177,258 sf 9.03% Impervious = 17,589 sf

Summary for Subcatchment PRDA#1: PR DA#1

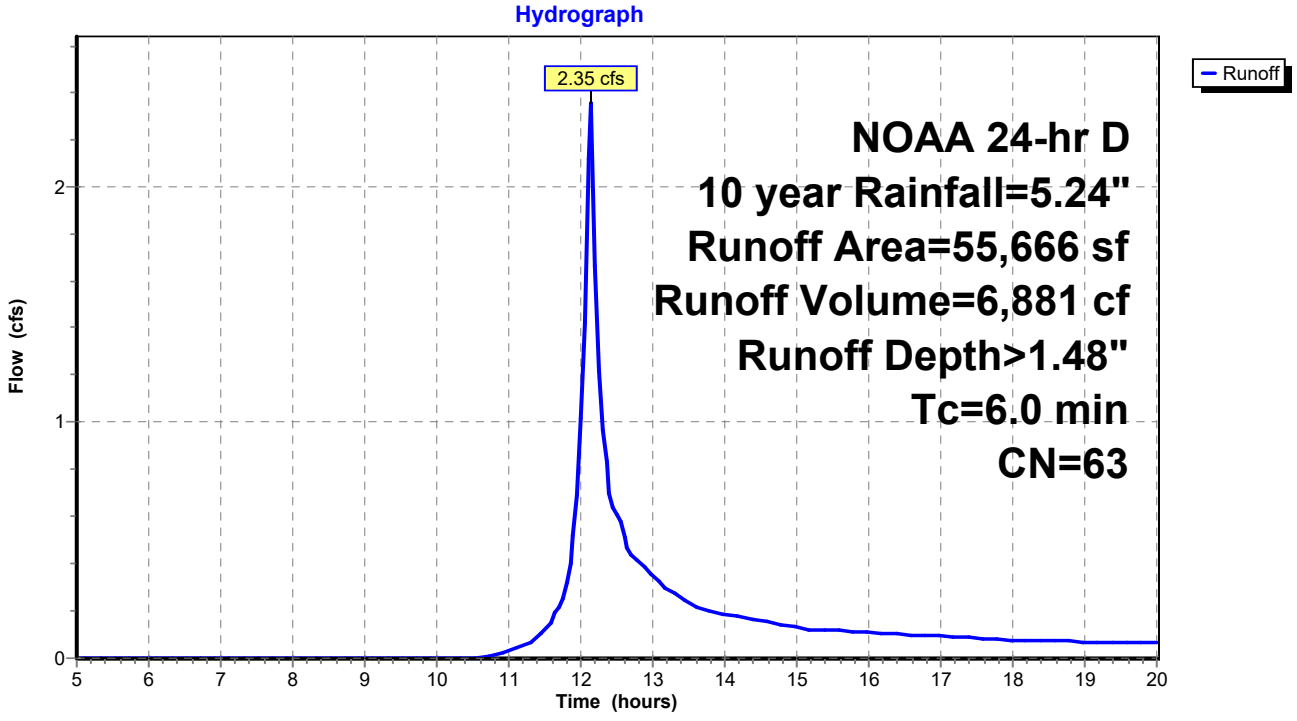
Runoff = 2.35 cfs @ 12.14 hrs, Volume= 6,881 cf, Depth> 1.48"
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Description
3,034	98	Paved parking, HSG B
52,632	61	>75% Grass cover, Good, HSG B
55,666	63	Weighted Average
52,632		94.55% Pervious Area
3,034		5.45% Impervious Area

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

Subcatchment PRDA#1: PR DA#1



Summary for Subcatchment PRDA#2: PR DA#2

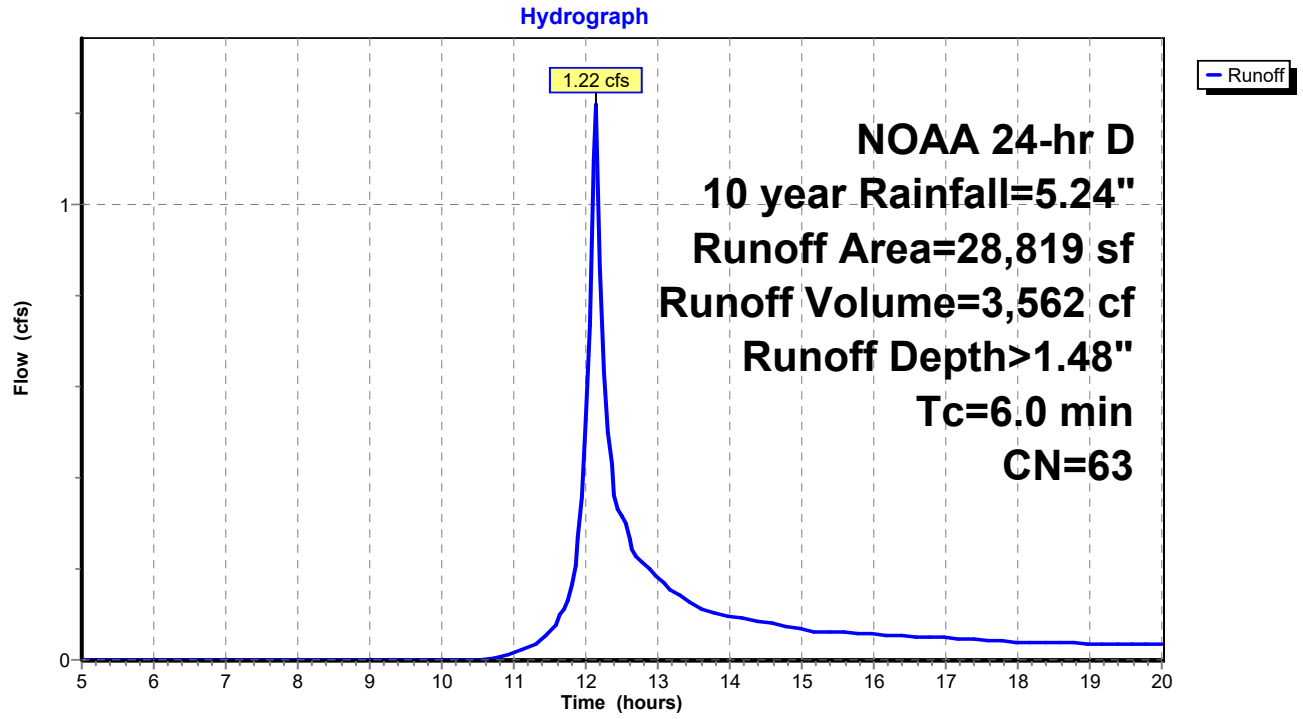
Runoff = 1.22 cfs @ 12.14 hrs, Volume= 3,562 cf, Depth> 1.48"
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Description
27,114	61	>75% Grass cover, Good, HSG B
314	98	Unconnected roofs, HSG B
1,391	98	Paved parking, HSG B
28,819	63	Weighted Average
27,114		94.08% Pervious Area
1,705		5.92% Impervious Area
314		18.42% Unconnected

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

Subcatchment PRDA#2: PR DA#2



Summary for Subcatchment PRDA#3: PR DA#3

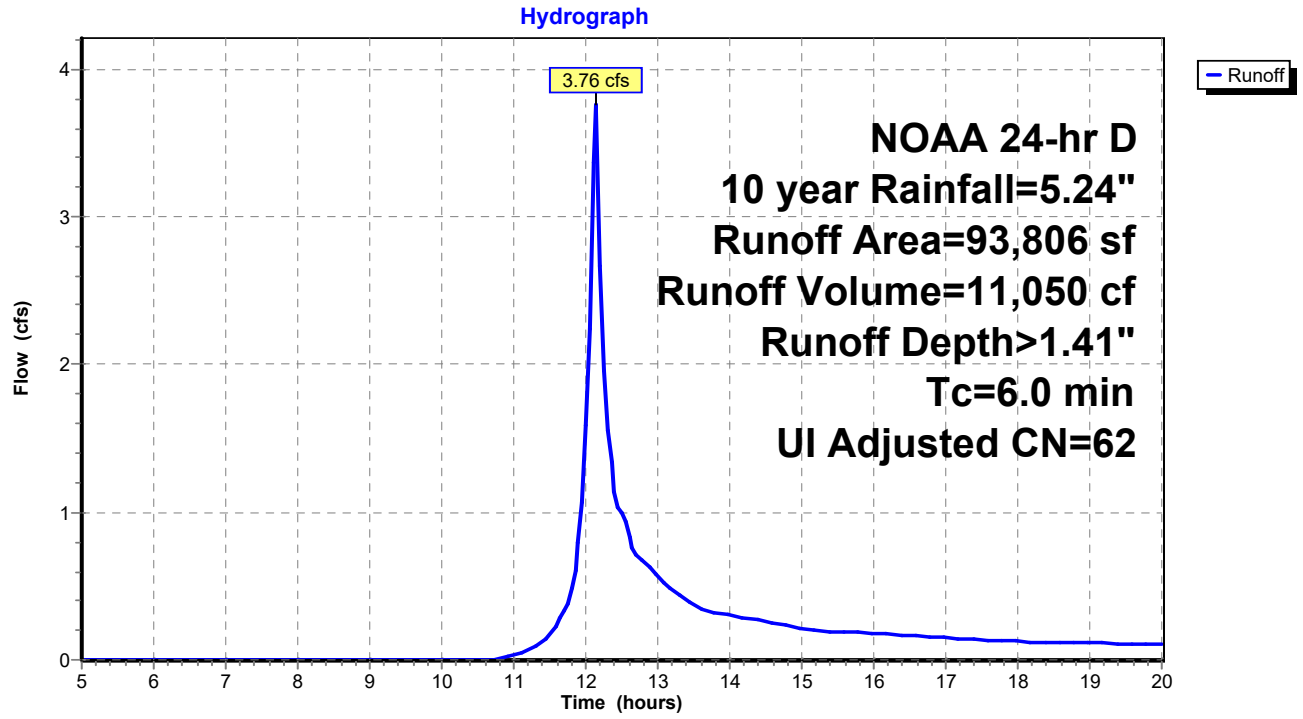
Runoff = 3.76 cfs @ 12.14 hrs, Volume= 11,050 cf, Depth> 1.41"
Routed to Pond 12P : Recharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Adj	Description
5,287	98		Unconnected pavement, HSG B
88,316	61		>75% Grass cover, Good, HSG B
203	98		Unconnected roofs, HSG B
93,806	63	62	Weighted Average, UI Adjusted
88,316			94.15% Pervious Area
5,490			5.85% Impervious Area
5,490			100.00% Unconnected

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

Subcatchment PRDA#3: PR DA#3



Summary for Subcatchment PRDA#4: PR DA#4

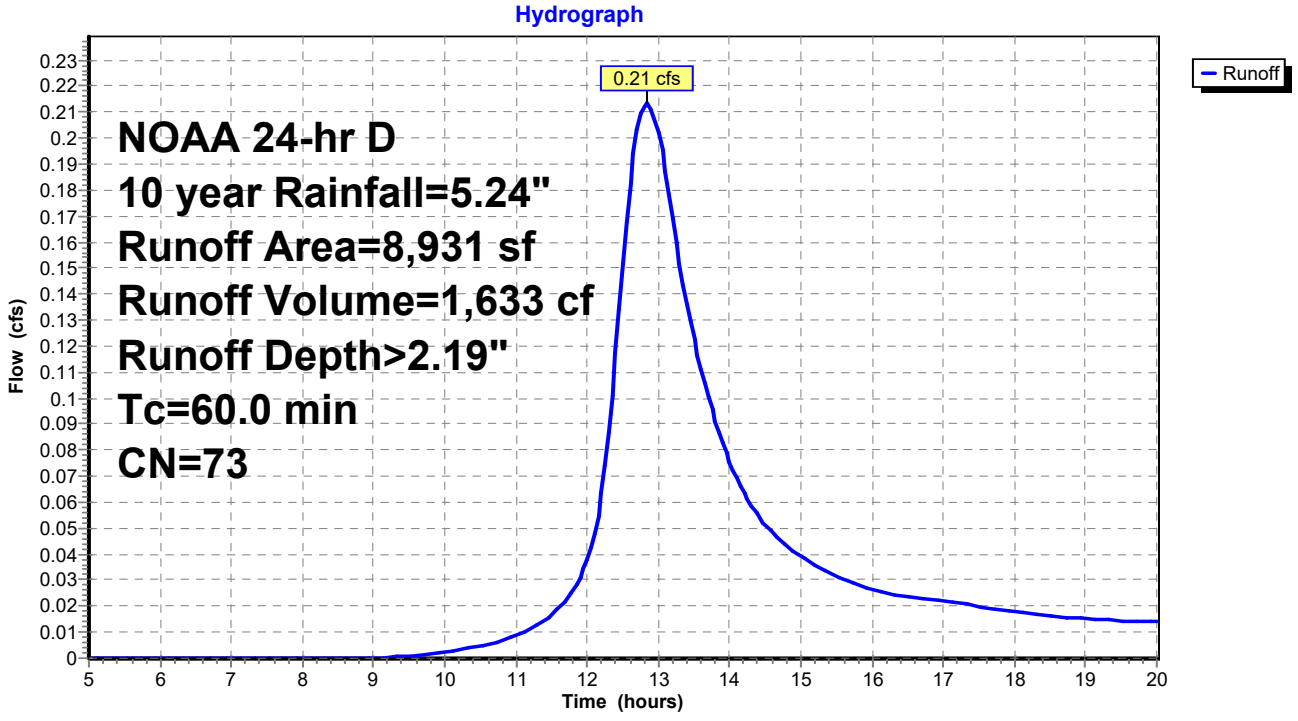
Runoff = 0.21 cfs @ 12.84 hrs, Volume= 1,633 cf, Depth> 2.19"
Routed to Pond 15P : Porous

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Description
1,179	98	Paved parking, HSG B
7,752	69	50-75% Grass cover, Fair, HSG B
8,931	73	Weighted Average
7,752		86.80% Pervious Area
1,179		13.20% Impervious Area

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

Subcatchment PRDA#4: PR DA#4



Summary for Subcatchment PRDA#5: PR DA#5

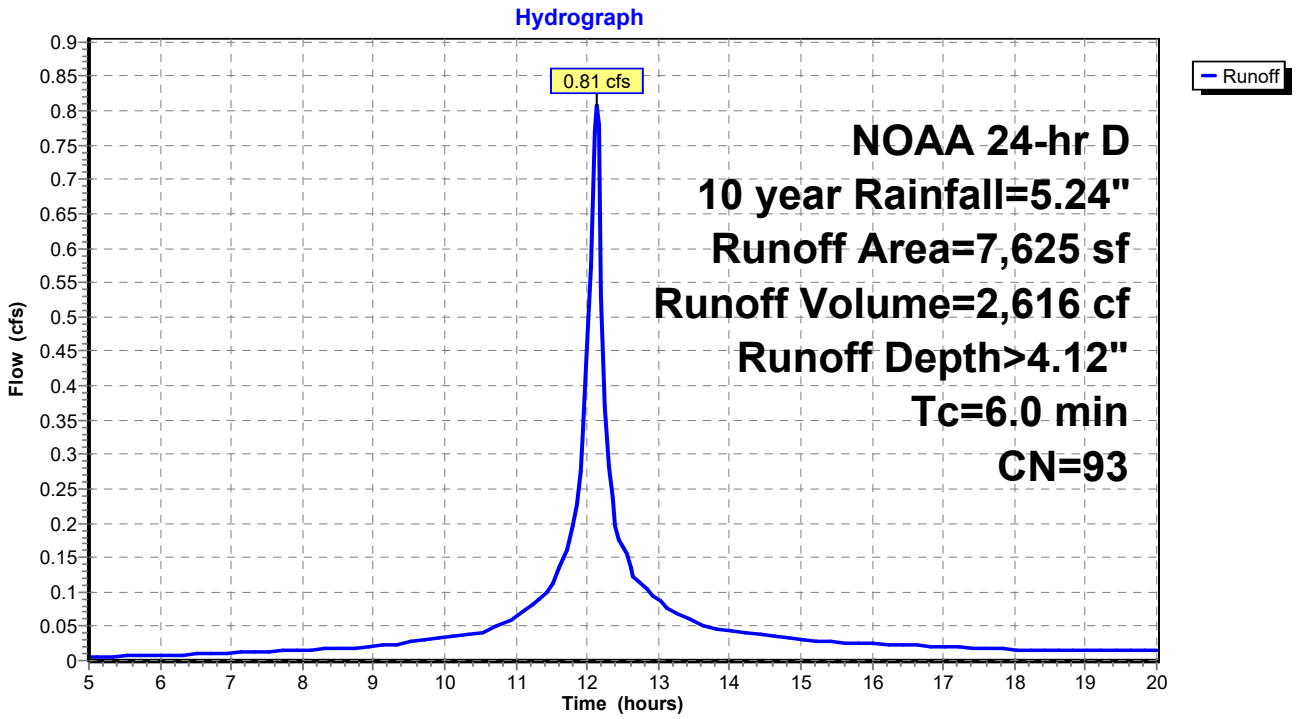
Runoff = 0.81 cfs @ 12.13 hrs, Volume= 2,616 cf, Depth> 4.12"
Routed to Reach PRDP#3 : PRDR #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 10 year Rainfall=5.24"

Area (sf)	CN	Description
6,181	98	Unconnected pavement, HSG B
1,444	69	50-75% Grass cover, Fair, HSG B
7,625	93	Weighted Average
1,444		18.94% Pervious Area
6,181		81.06% Impervious Area
6,181		100.00% Unconnected

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

Subcatchment PRDA#5: PR DA#5

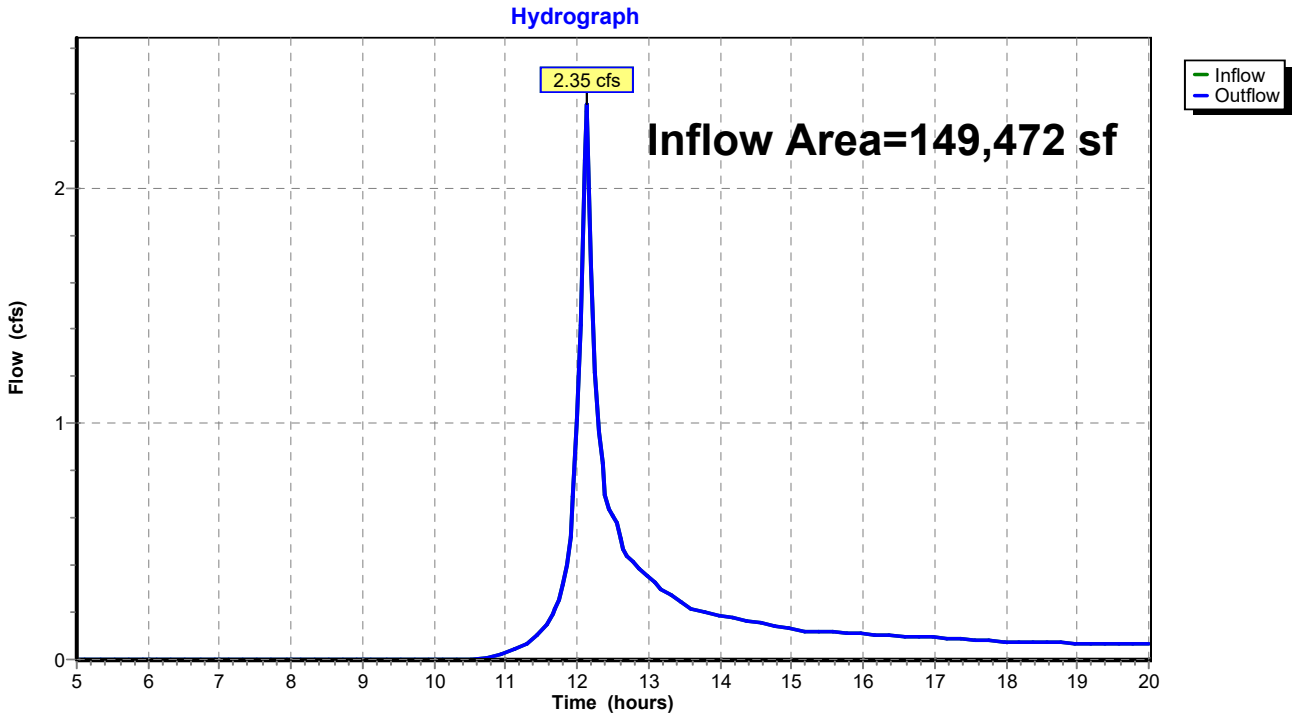


Summary for Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

Inflow Area = 149,472 sf, 5.70% Impervious, Inflow Depth > 0.55" for 10 year event
Inflow = 2.35 cfs @ 12.14 hrs, Volume= 6,881 cf
Outflow = 2.35 cfs @ 12.14 hrs, Volume= 6,881 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

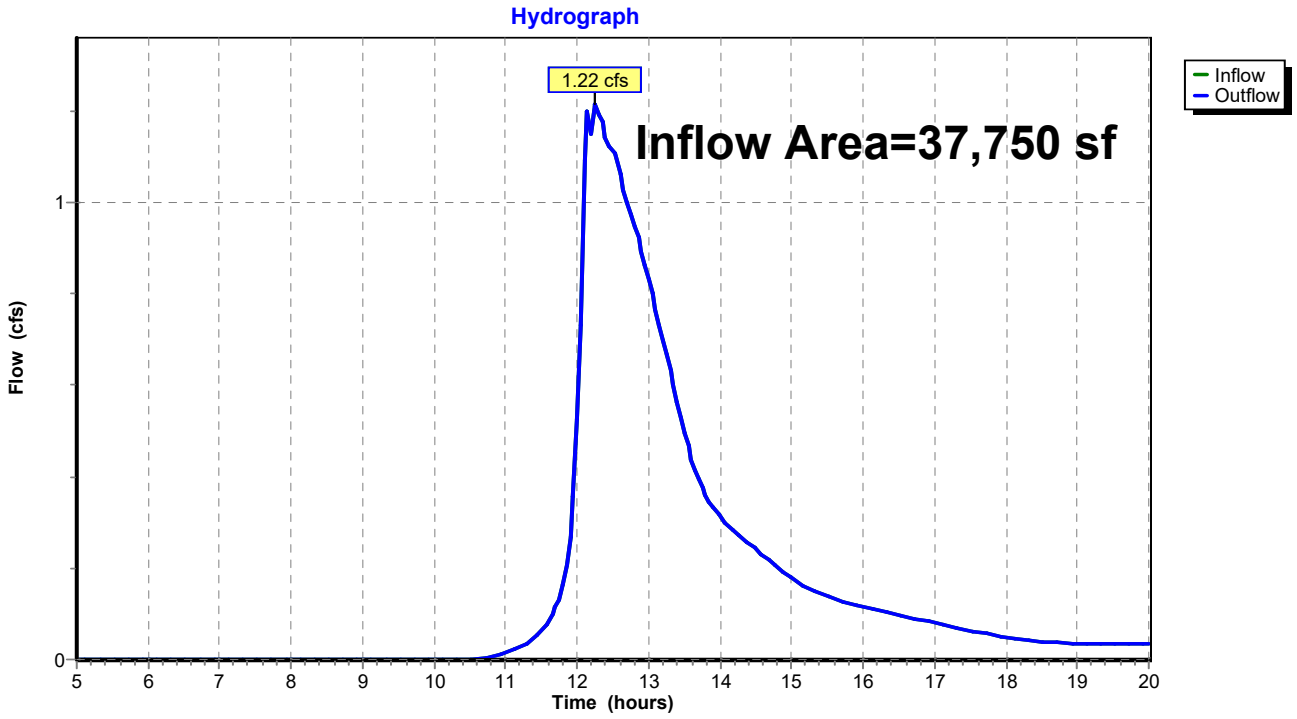


Summary for Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

Inflow Area = 37,750 sf, 7.64% Impervious, Inflow Depth > 2.62" for 10 year event
Inflow = 1.22 cfs @ 12.26 hrs, Volume= 8,232 cf
Outflow = 1.22 cfs @ 12.26 hrs, Volume= 8,232 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

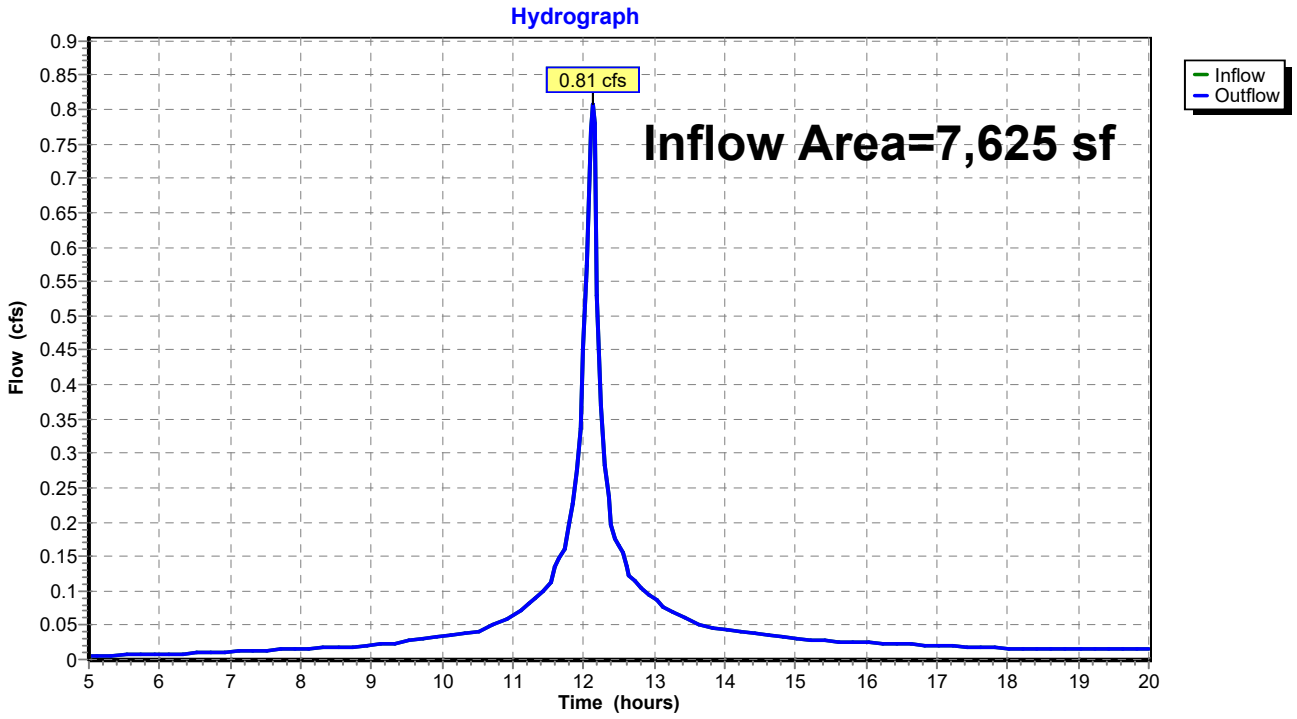


Summary for Reach PRDP#3: PRDR #3 (OFFSITE)

Inflow Area = 7,625 sf, 81.06% Impervious, Inflow Depth > 4.12" for 10 year event
Inflow = 0.81 cfs @ 12.13 hrs, Volume= 2,616 cf
Outflow = 0.81 cfs @ 12.13 hrs, Volume= 2,616 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#3: PRDR #3 (OFFSITE)

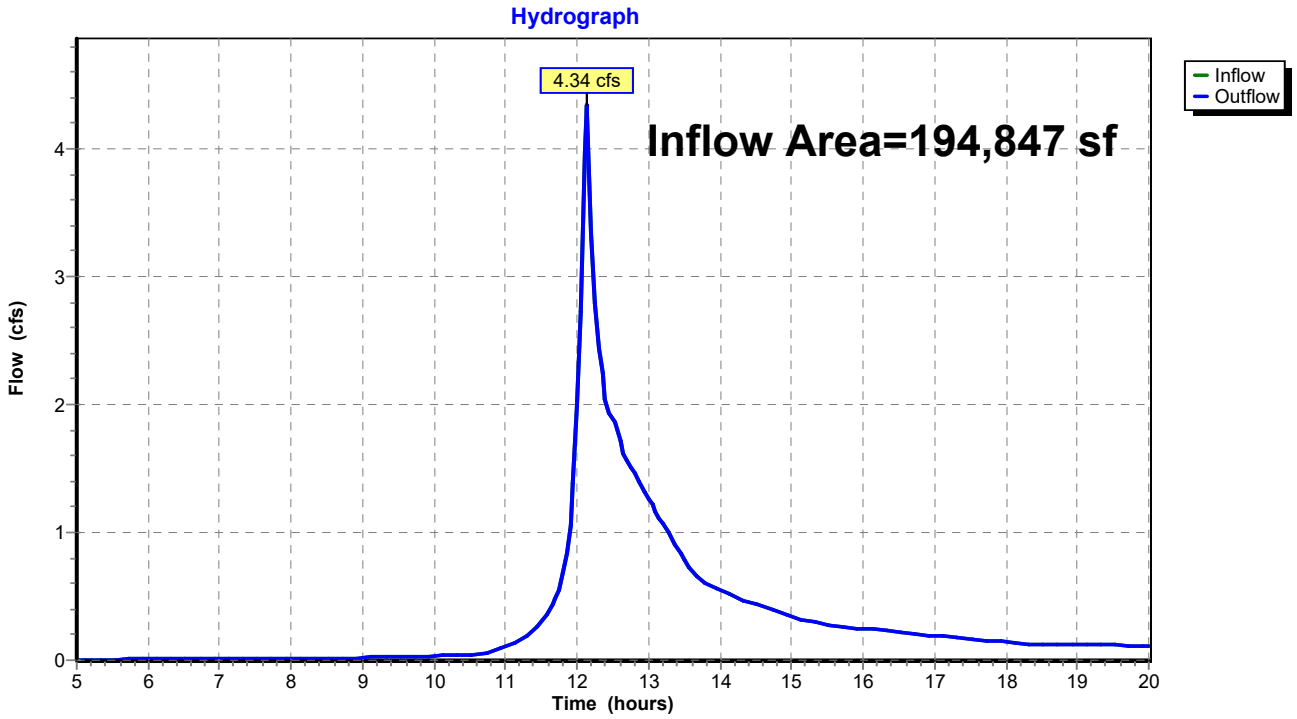


Summary for Reach PRDP#4: PRDP#4 CULVERT

Inflow Area = 194,847 sf, 9.03% Impervious, Inflow Depth > 1.09" for 10 year event
Inflow = 4.34 cfs @ 12.14 hrs, Volume= 17,729 cf
Outflow = 4.34 cfs @ 12.14 hrs, Volume= 17,729 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#4: PRDP#4 CULVERT



Summary for Pond 12P: Recharge

Inflow Area = 93,806 sf, 5.85% Impervious, Inflow Depth > 1.41" for 10 year event
Inflow = 3.76 cfs @ 12.14 hrs, Volume= 11,050 cf
Outflow = 0.94 cfs @ 12.54 hrs, Volume= 8,835 cf, Atten= 75%, Lag= 24.4 min
Discarded = 0.13 cfs @ 12.35 hrs, Volume= 4,165 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)
Secondary = 0.80 cfs @ 12.54 hrs, Volume= 4,669 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.14' @ 12.54 hrs Surf.Area= 5,615 sf Storage= 3,431 cf

Plug-Flow detention time= 101.9 min calculated for 8,835 cf (80% of inflow)
Center-of-Mass det. time= 44.7 min (870.1 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	45.60'	4,862 cf	**5.50'W x 1,020.00'L x 4.50'H Field A** 25,245 cf Overall - 9,038 cf Embedded = 16,207 cf x 30.0% Voids
#2A	46.10'	7,242 cf	**ADS N-12 36"** Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows
#3	47.00'	15 cf	**1.0" Round Pipe Storage** L= 2,830.0' S= 0.0010 '/'
		12,119 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	46.80'	**24.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	47.20'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Discarded	45.60'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 12.35 hrs HW=47.10' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.60' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.80 cfs @ 12.54 hrs HW=47.14' (Free Discharge)
├**2=Orifice/Grate** (Controls 0.00 cfs)
├**3=Orifice/Grate** (Orifice Controls 0.80 cfs @ 2.41 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 12P: Recharge - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows

1 Chambers/Row x 20.00' Long +1,000.00' Row Adjustment = 1,020.00' Row Length
1 Rows x 42.0" Wide + 12.0" Side Stone x 2 = 5.50' Base Width
6.0" Stone Base + 42.0" Chamber Height + 6.0" Stone Cover = 4.50' Field Height

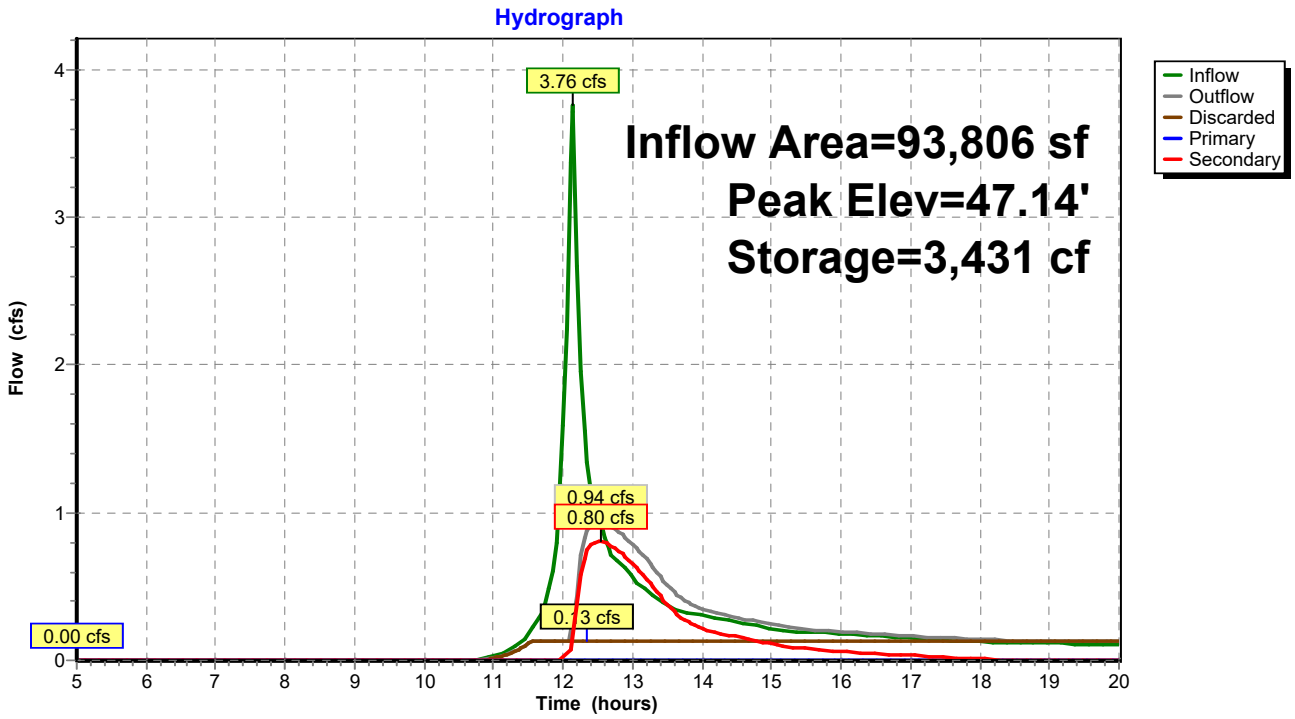
1 Chambers x 142.0 cf +1,000.00' Row Adjustment x 7.10 sf x 1 Rows = 7,242.0 cf Chamber Storage
1 Chambers x 177.1 cf +1,000.00' Row Adjustment x 8.86 sf x 1 Rows = 9,034.4 cf Displacement

25,244.9 cf Field - 9,034.4 cf Chambers = 16,210.5 cf Stone x 30.0% Voids = 4,863.2 cf Stone Storage

Chamber Storage + Stone Storage = 12,105.2 cf = 0.278 af
Overall Storage Efficiency = 48.0%
Overall System Size = 1,020.00' x 5.50' x 4.50'

1 Chambers
935.0 cy Field
600.4 cy Stone

Pond 12P: Recharge



Summary for Pond 15P: Porous

Inflow Area = 8,931 sf, 13.20% Impervious, Inflow Depth > 2.19" for 10 year event
Inflow = 0.21 cfs @ 12.84 hrs, Volume= 1,633 cf
Outflow = 0.05 cfs @ 14.45 hrs, Volume= 1,588 cf, Atten= 75%, Lag= 96.6 min
Discarded = 0.05 cfs @ 14.45 hrs, Volume= 1,588 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 45.25' @ 14.45 hrs Surf.Area= 2,236 sf Storage= 618 cf

Plug-Flow detention time= 113.1 min calculated for 1,583 cf (97% of inflow)
Center-of-Mass det. time= 103.5 min (946.4 - 842.9)

Volume	Invert	Avail.Storage	Storage Description
#1	44.83'	18 cf	**6.0" Round Pipe Storage** L= 90.0' S= 0.0050 '/'
#2	44.32'	1,508 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		1,525 cf	Total Available Storage

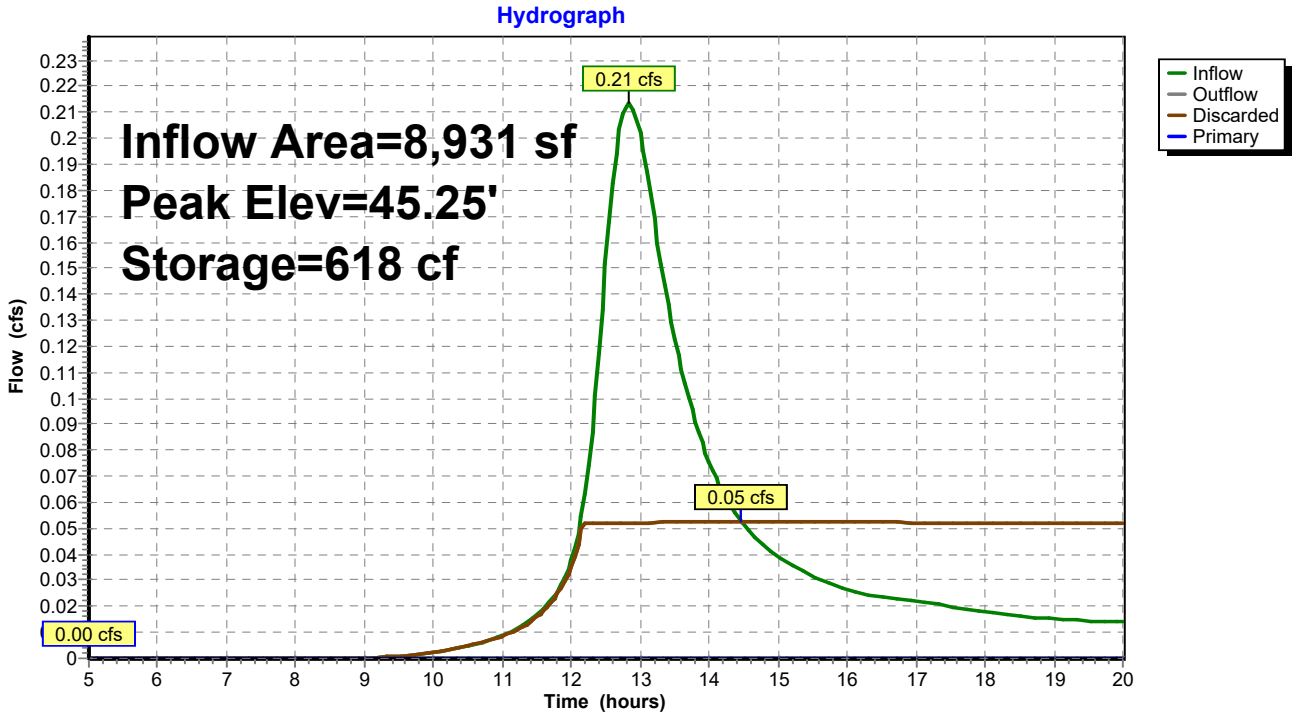
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.32	2,201	0.0	0	0
44.33	2,201	30.0	7	7
45.33	2,201	30.0	660	667
47.24	2,201	20.0	841	1,508

Device	Routing	Invert	Outlet Devices
#1	Primary	45.33'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	44.32'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 14.45 hrs HW=45.25' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.32' (Free Discharge)
↑—**1=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: Porous



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPRDA#1: PR DA#1 Runoff Area=55,666 sf 5.45% Impervious Runoff Depth>2.24"
Tc=6.0 min CN=63 Runoff=3.59 cfs 10,376 cf

SubcatchmentPRDA#2: PR DA#2 Runoff Area=28,819 sf 5.92% Impervious Runoff Depth>2.24"
Tc=6.0 min CN=63 Runoff=1.86 cfs 5,372 cf

SubcatchmentPRDA#3: PR DA#3 Runoff Area=93,806 sf 5.85% Impervious Runoff Depth>2.15"
Tc=6.0 min UI Adjusted CN=62 Runoff=5.80 cfs 16,803 cf

SubcatchmentPRDA#4: PR DA#4 Runoff Area=8,931 sf 13.20% Impervious Runoff Depth>3.09"
Tc=60.0 min CN=73 Runoff=0.30 cfs 2,299 cf

SubcatchmentPRDA#5: PR DA#5 Runoff Area=7,625 sf 81.06% Impervious Runoff Depth>5.19"
Tc=6.0 min CN=93 Runoff=1.01 cfs 3,300 cf

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND) Inflow=3.59 cfs 10,376 cf
Outflow=3.59 cfs 10,376 cf

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND) Inflow=3.44 cfs 15,726 cf
Outflow=3.44 cfs 15,726 cf

Reach PRDP#3: PRDR #3 (OFFSITE) Inflow=1.01 cfs 3,300 cf
Outflow=1.01 cfs 3,300 cf

Reach PRDP#4: PRDP#4 CULVERT Inflow=7.41 cfs 29,402 cf
Outflow=7.41 cfs 29,402 cf

Pond 12P: Recharge Peak Elev=47.47' Storage=4,622 cf Inflow=5.80 cfs 16,803 cf
Discarded=0.13 cfs 4,428 cf Primary=0.00 cfs 0 cf Secondary=2.55 cfs 9,989 cf Outflow=2.68 cfs 14,416 cf

Pond 15P: Porous Peak Elev=45.53' Storage=771 cf Inflow=0.30 cfs 2,299 cf
Discarded=0.05 cfs 1,681 cf Primary=0.11 cfs 366 cf Outflow=0.17 cfs 2,047 cf

Total Runoff Area = 194,847 sf Runoff Volume = 38,149 cf Average Runoff Depth = 2.35"
90.97% Pervious = 177,258 sf 9.03% Impervious = 17,589 sf

Summary for Subcatchment PRDA#1: PR DA#1

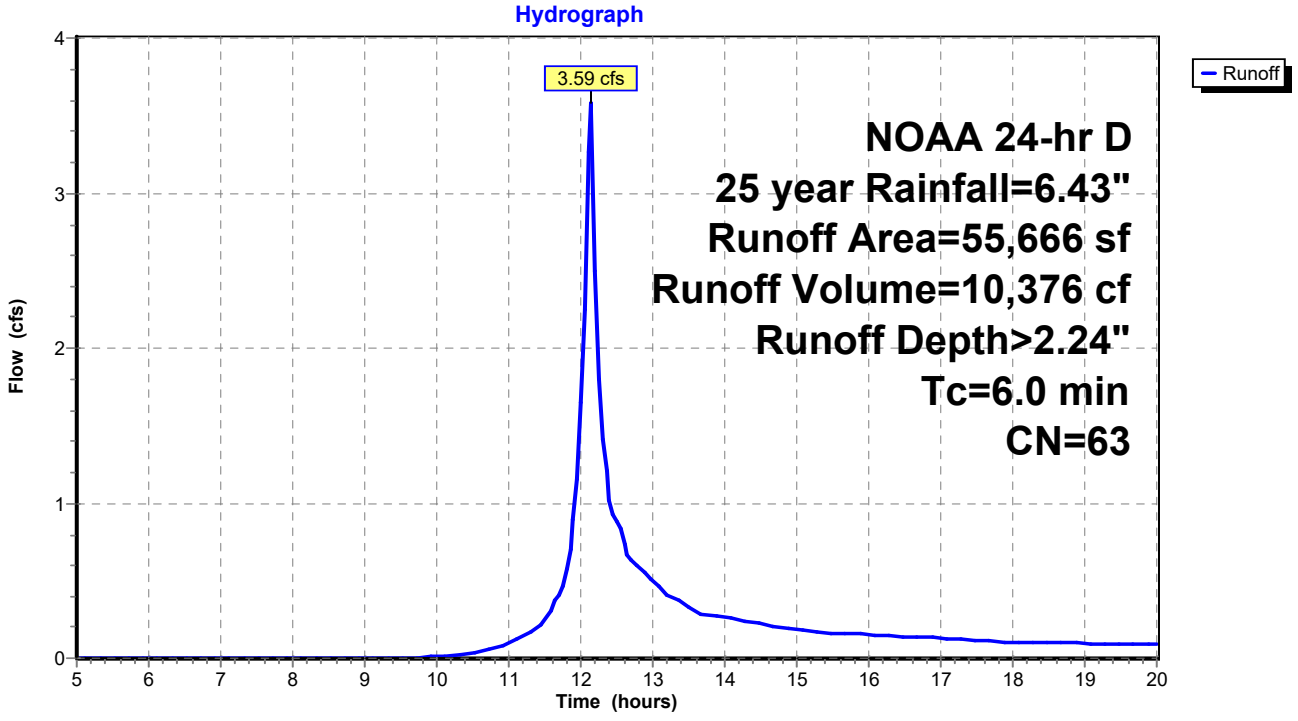
Runoff = 3.59 cfs @ 12.13 hrs, Volume= 10,376 cf, Depth> 2.24"
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Description
3,034	98	Paved parking, HSG B
52,632	61	>75% Grass cover, Good, HSG B
55,666	63	Weighted Average
52,632		94.55% Pervious Area
3,034		5.45% Impervious Area

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

Subcatchment PRDA#1: PR DA#1



Summary for Subcatchment PRDA#2: PR DA#2

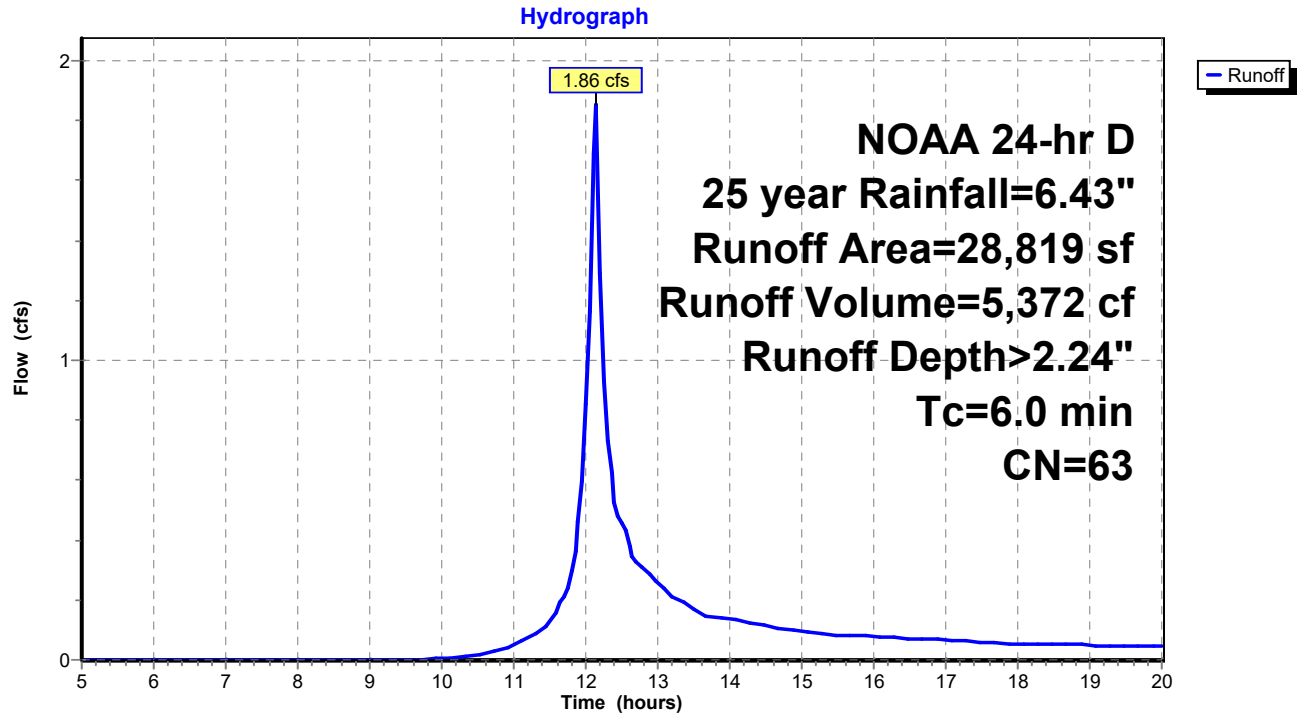
Runoff = 1.86 cfs @ 12.13 hrs, Volume= 5,372 cf, Depth> 2.24"
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Description
27,114	61	>75% Grass cover, Good, HSG B
314	98	Unconnected roofs, HSG B
1,391	98	Paved parking, HSG B
28,819	63	Weighted Average
27,114		94.08% Pervious Area
1,705		5.92% Impervious Area
314		18.42% Unconnected

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

Subcatchment PRDA#2: PR DA#2



Summary for Subcatchment PRDA#3: PR DA#3

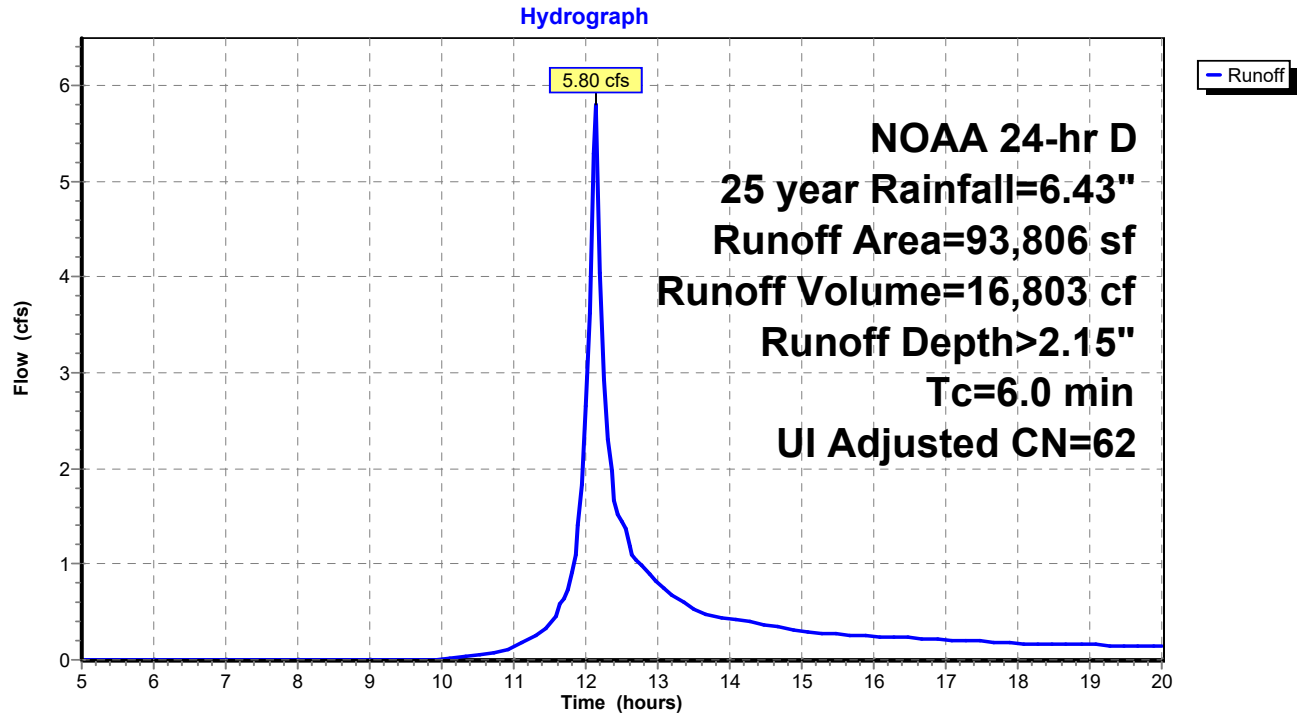
Runoff = 5.80 cfs @ 12.14 hrs, Volume= 16,803 cf, Depth> 2.15"
Routed to Pond 12P : Recharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Adj	Description
5,287	98		Unconnected pavement, HSG B
88,316	61		>75% Grass cover, Good, HSG B
203	98		Unconnected roofs, HSG B
93,806	63	62	Weighted Average, UI Adjusted
88,316			94.15% Pervious Area
5,490			5.85% Impervious Area
5,490			100.00% Unconnected

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

Subcatchment PRDA#3: PR DA#3



Summary for Subcatchment PRDA#4: PR DA#4

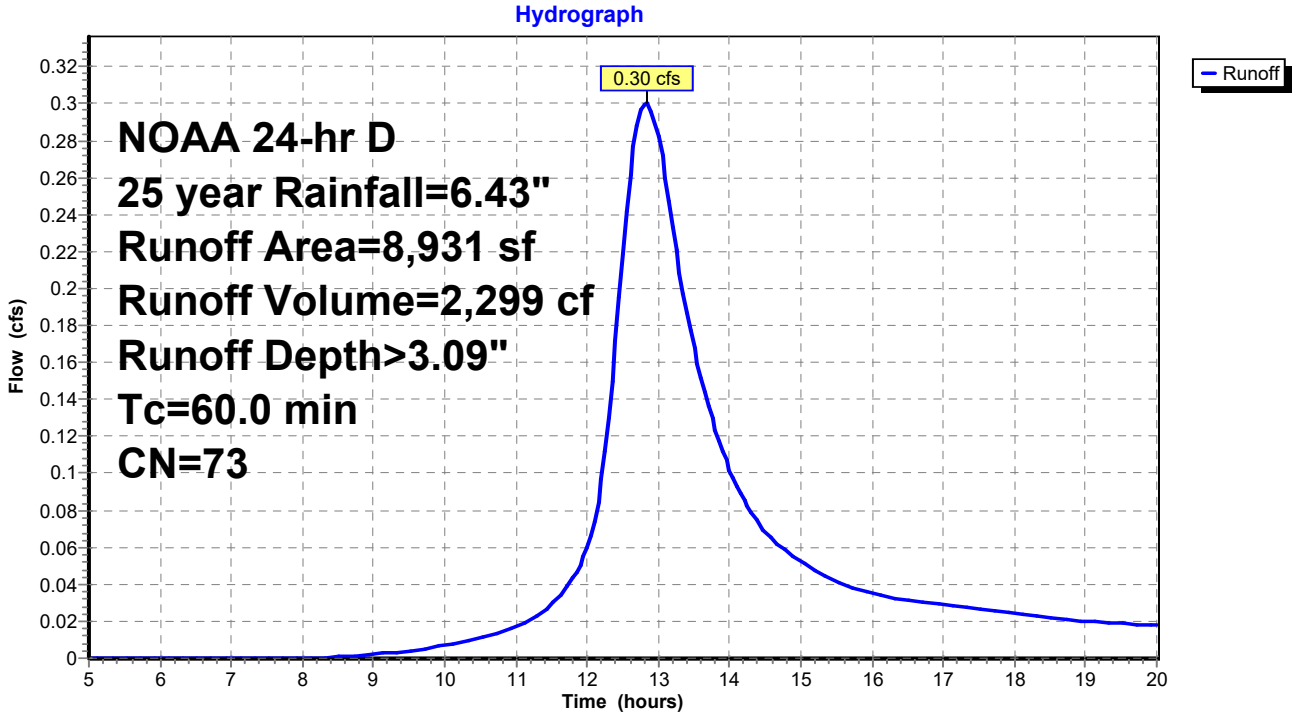
Runoff = 0.30 cfs @ 12.83 hrs, Volume= 2,299 cf, Depth> 3.09"
Routed to Pond 15P : Porous

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Description
1,179	98	Paved parking, HSG B
7,752	69	50-75% Grass cover, Fair, HSG B
8,931	73	Weighted Average
7,752		86.80% Pervious Area
1,179		13.20% Impervious Area

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

Subcatchment PRDA#4: PR DA#4



Summary for Subcatchment PRDA#5: PR DA#5

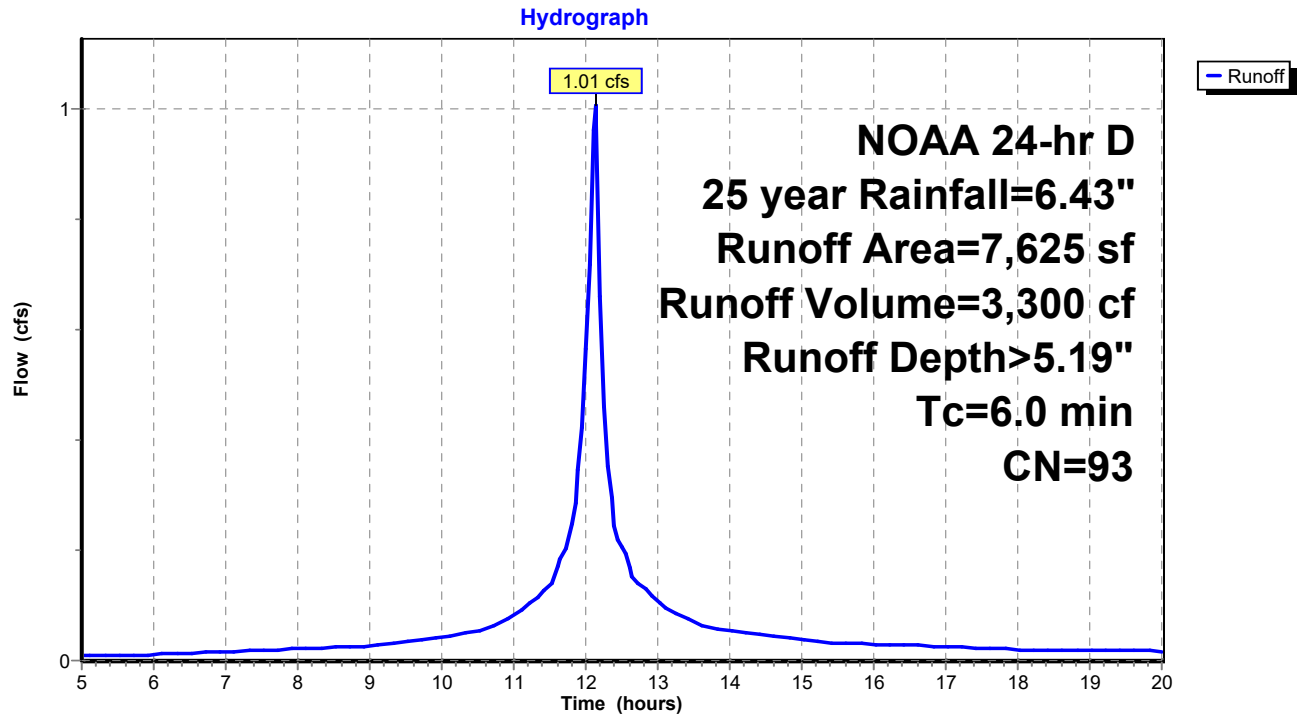
Runoff = 1.01 cfs @ 12.13 hrs, Volume= 3,300 cf, Depth> 5.19"
Routed to Reach PRDP#3 : PRDR #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 25 year Rainfall=6.43"

Area (sf)	CN	Description
6,181	98	Unconnected pavement, HSG B
1,444	69	50-75% Grass cover, Fair, HSG B
7,625	93	Weighted Average
1,444		18.94% Pervious Area
6,181		81.06% Impervious Area
6,181		100.00% Unconnected

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

Subcatchment PRDA#5: PR DA#5

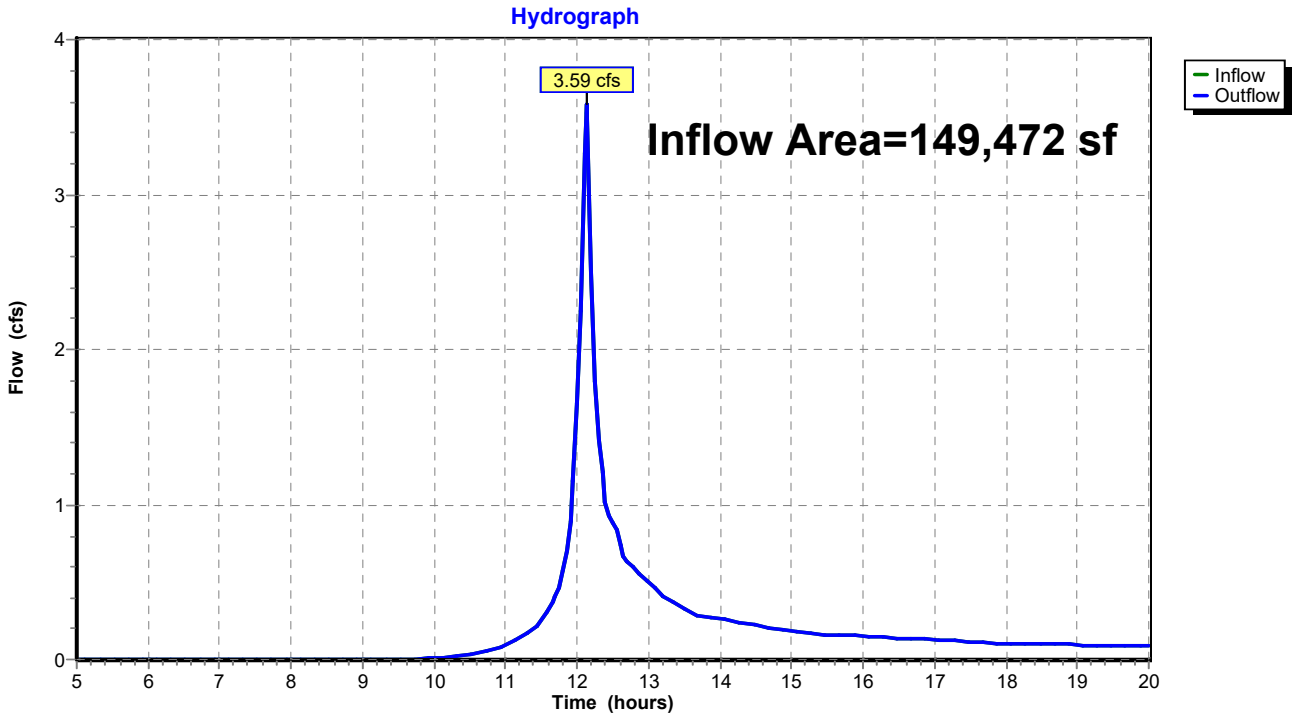


Summary for Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

Inflow Area = 149,472 sf, 5.70% Impervious, Inflow Depth > 0.83" for 25 year event
Inflow = 3.59 cfs @ 12.13 hrs, Volume= 10,376 cf
Outflow = 3.59 cfs @ 12.13 hrs, Volume= 10,376 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

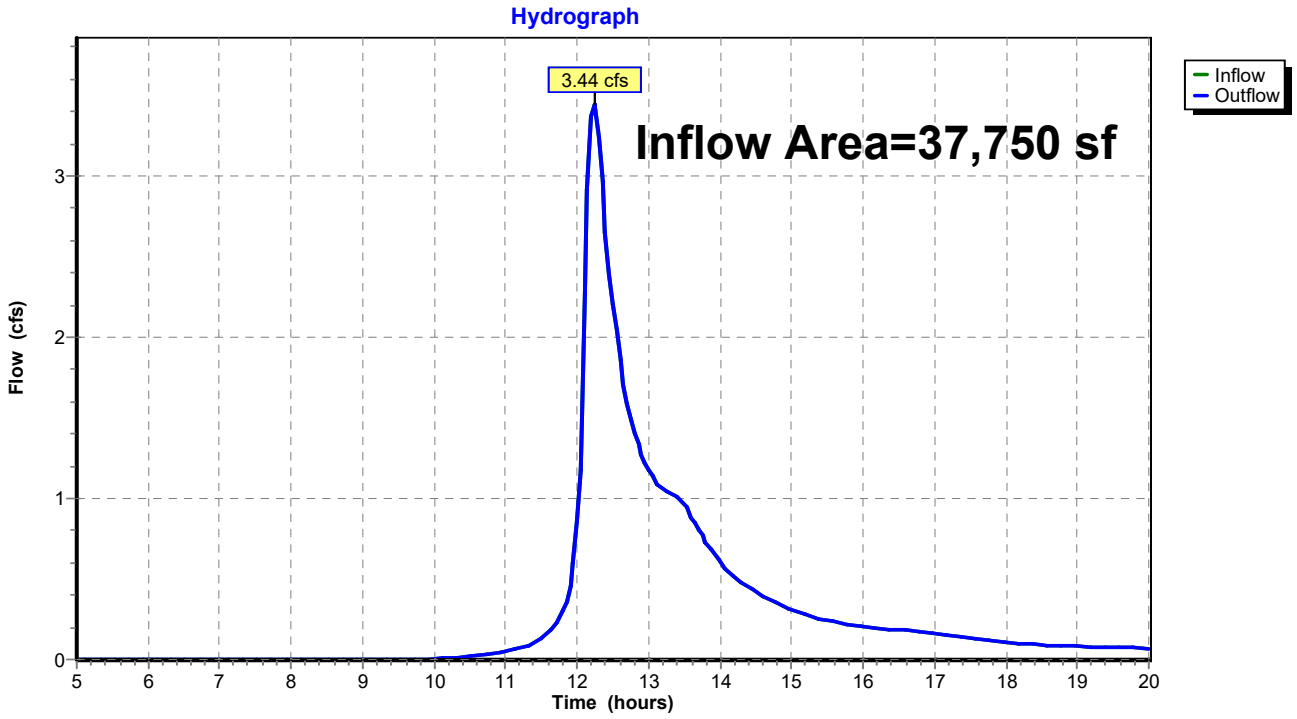


Summary for Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

Inflow Area = 37,750 sf, 7.64% Impervious, Inflow Depth > 5.00" for 25 year event
Inflow = 3.44 cfs @ 12.24 hrs, Volume= 15,726 cf
Outflow = 3.44 cfs @ 12.24 hrs, Volume= 15,726 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

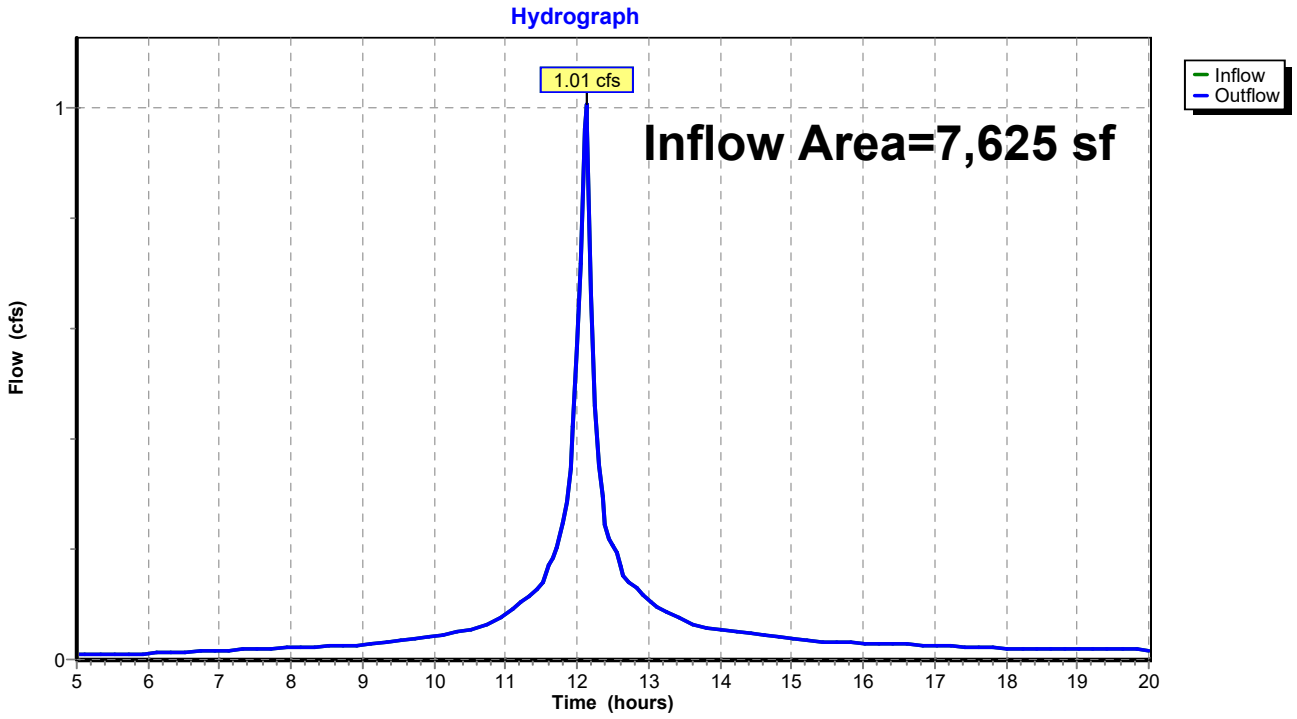


Summary for Reach PRDP#3: PRDR #3 (OFFSITE)

Inflow Area = 7,625 sf, 81.06% Impervious, Inflow Depth > 5.19" for 25 year event
Inflow = 1.01 cfs @ 12.13 hrs, Volume= 3,300 cf
Outflow = 1.01 cfs @ 12.13 hrs, Volume= 3,300 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#3: PRDR #3 (OFFSITE)

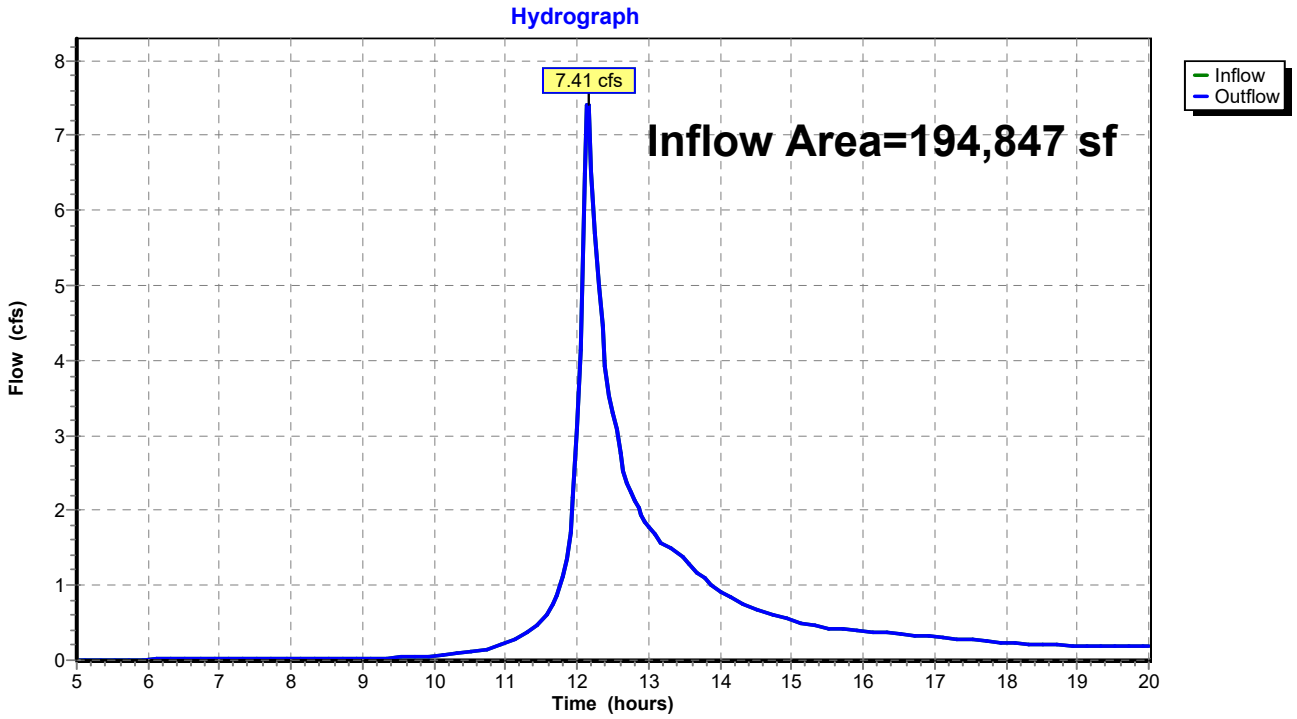


Summary for Reach PRDP#4: PRDP#4 CULVERT

Inflow Area = 194,847 sf, 9.03% Impervious, Inflow Depth > 1.81" for 25 year event
Inflow = 7.41 cfs @ 12.15 hrs, Volume= 29,402 cf
Outflow = 7.41 cfs @ 12.15 hrs, Volume= 29,402 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#4: PRDP#4 CULVERT



Summary for Pond 12P: Recharge

Inflow Area = 93,806 sf, 5.85% Impervious, Inflow Depth > 2.15" for 25 year event
Inflow = 5.80 cfs @ 12.14 hrs, Volume= 16,803 cf
Outflow = 2.68 cfs @ 12.27 hrs, Volume= 14,416 cf, Atten= 54%, Lag= 8.4 min
Discarded = 0.13 cfs @ 12.15 hrs, Volume= 4,428 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)
Secondary = 2.55 cfs @ 12.27 hrs, Volume= 9,989 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.47' @ 12.27 hrs Surf.Area= 5,615 sf Storage= 4,622 cf

Plug-Flow detention time= 74.8 min calculated for 14,416 cf (86% of inflow)
Center-of-Mass det. time= 30.8 min (846.1 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	45.60'	4,862 cf	**5.50'W x 1,020.00'L x 4.50'H Field A** 25,245 cf Overall - 9,038 cf Embedded = 16,207 cf x 30.0% Voids
#2A	46.10'	7,242 cf	**ADS N-12 36"** Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows
#3	47.00'	15 cf	**1.0" Round Pipe Storage** L= 2,830.0' S= 0.0010 '/'
		12,119 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	46.80'	**24.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	47.20'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Discarded	45.60'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 12.15 hrs HW=47.25' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.60' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=2.50 cfs @ 12.27 hrs HW=47.46' (Free Discharge)
├**2=Orifice/Grate** (Controls 0.00 cfs)
├**3=Orifice/Grate** (Orifice Controls 1.22 cfs @ 3.65 fps)
└**4=Orifice/Grate** (Orifice Controls 1.28 cfs @ 1.64 fps)

Pond 12P: Recharge - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows

1 Chambers/Row x 20.00' Long +1,000.00' Row Adjustment = 1,020.00' Row Length
1 Rows x 42.0" Wide + 12.0" Side Stone x 2 = 5.50' Base Width
6.0" Stone Base + 42.0" Chamber Height + 6.0" Stone Cover = 4.50' Field Height

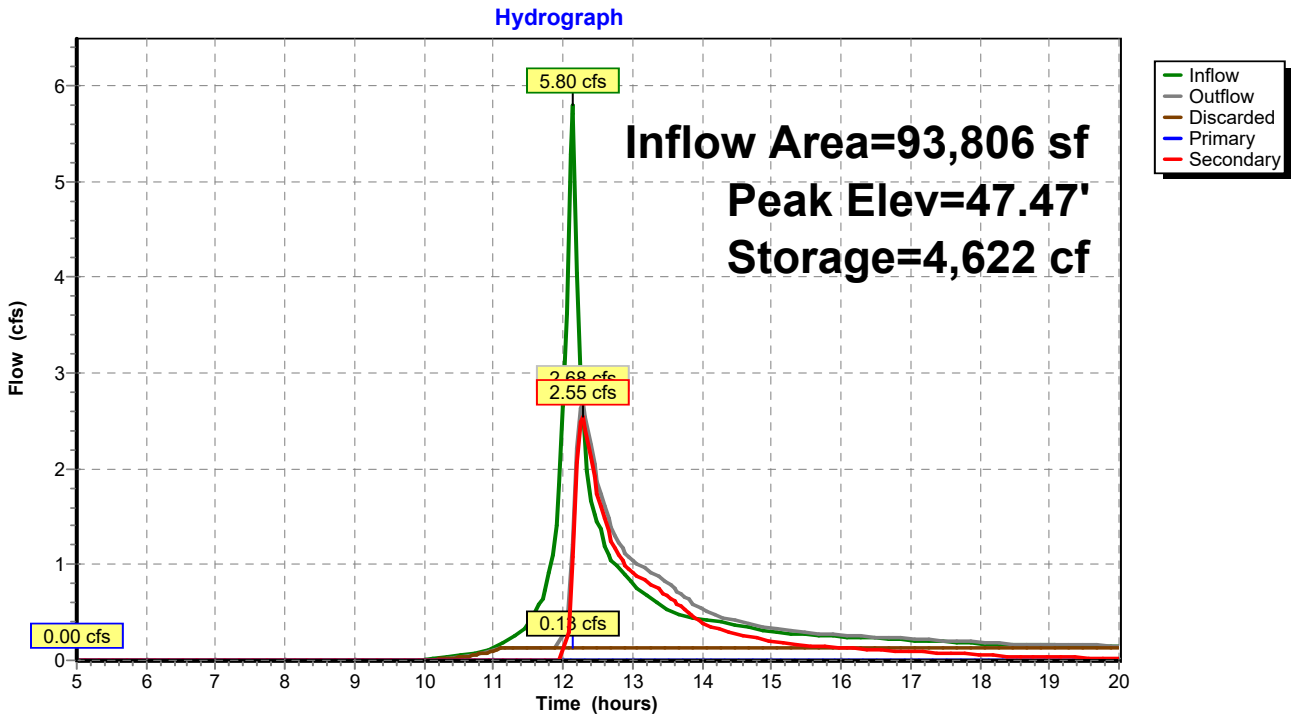
1 Chambers x 142.0 cf +1,000.00' Row Adjustment x 7.10 sf x 1 Rows = 7,242.0 cf Chamber Storage
1 Chambers x 177.1 cf +1,000.00' Row Adjustment x 8.86 sf x 1 Rows = 9,034.4 cf Displacement

25,244.9 cf Field - 9,034.4 cf Chambers = 16,210.5 cf Stone x 30.0% Voids = 4,863.2 cf Stone Storage

Chamber Storage + Stone Storage = 12,105.2 cf = 0.278 af
Overall Storage Efficiency = 48.0%
Overall System Size = 1,020.00' x 5.50' x 4.50'

1 Chambers
935.0 cy Field
600.4 cy Stone

Pond 12P: Recharge



Summary for Pond 15P: Porous

Inflow Area = 8,931 sf, 13.20% Impervious, Inflow Depth > 3.09" for 25 year event
Inflow = 0.30 cfs @ 12.83 hrs, Volume= 2,299 cf
Outflow = 0.17 cfs @ 13.52 hrs, Volume= 2,047 cf, Atten= 45%, Lag= 40.9 min
Discarded = 0.05 cfs @ 15.87 hrs, Volume= 1,681 cf
Primary = 0.11 cfs @ 13.52 hrs, Volume= 366 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 45.53' @ 13.52 hrs Surf.Area= 2,220 sf Storage= 771 cf

Plug-Flow detention time= 111.6 min calculated for 2,047 cf (89% of inflow)
Center-of-Mass det. time= 79.0 min (914.0 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	44.83'	18 cf	**6.0" Round Pipe Storage** L= 90.0' S= 0.0050 '/'
#2	44.32'	1,508 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		1,525 cf	Total Available Storage

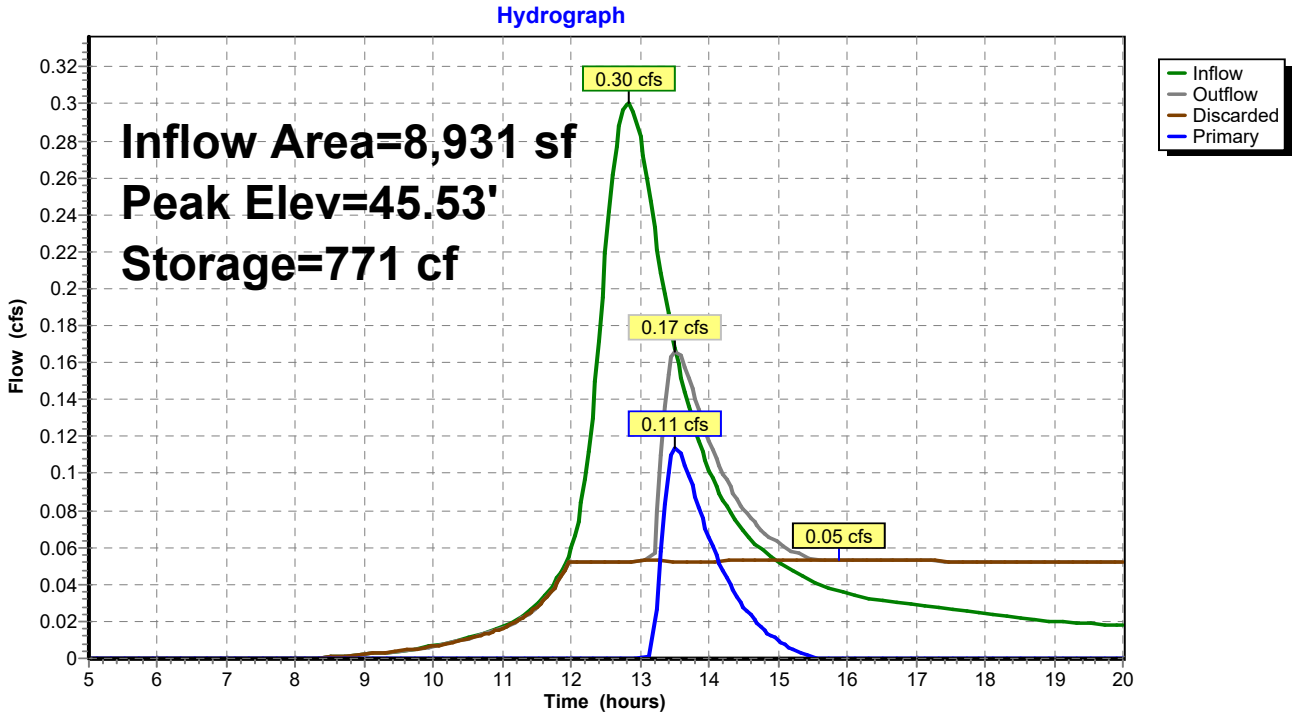
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.32	2,201	0.0	0	0
44.33	2,201	30.0	7	7
45.33	2,201	30.0	660	667
47.24	2,201	20.0	841	1,508

Device	Routing	Invert	Outlet Devices
#1	Primary	45.33'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	44.32'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 15.87 hrs HW=45.31' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.11 cfs @ 13.52 hrs HW=45.53' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.11 cfs @ 1.53 fps)

Pond 15P: Porous



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPRDA#1: PR DA#1 Runoff Area=55,666 sf 5.45% Impervious Runoff Depth>3.53"
Tc=6.0 min CN=63 Runoff=5.64 cfs 16,357 cf

SubcatchmentPRDA#2: PR DA#2 Runoff Area=28,819 sf 5.92% Impervious Runoff Depth>3.53"
Tc=6.0 min CN=63 Runoff=2.92 cfs 8,468 cf

SubcatchmentPRDA#3: PR DA#3 Runoff Area=93,806 sf 5.85% Impervious Runoff Depth>3.42"
Tc=6.0 min UI Adjusted CN=62 Runoff=9.22 cfs 26,705 cf

SubcatchmentPRDA#4: PR DA#4 Runoff Area=8,931 sf 13.20% Impervious Runoff Depth>4.55"
Tc=60.0 min CN=73 Runoff=0.44 cfs 3,388 cf

SubcatchmentPRDA#5: PR DA#5 Runoff Area=7,625 sf 81.06% Impervious Runoff Depth>6.84"
Tc=6.0 min CN=93 Runoff=1.31 cfs 4,349 cf

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND) Inflow=5.64 cfs 16,357 cf
Outflow=5.64 cfs 16,357 cf

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND) Inflow=8.60 cfs 28,974 cf
Outflow=8.60 cfs 28,974 cf

Reach PRDP#3: PRDR #3 (OFFSITE) Inflow=1.31 cfs 4,349 cf
Outflow=1.31 cfs 4,349 cf

Reach PRDP#4: PRDP#4 CULVERT Inflow=15.22 cfs 49,680 cf
Outflow=15.22 cfs 49,680 cf

Pond 12P: Recharge Peak Elev=47.86' Storage=6,112 cf Inflow=9.22 cfs 26,705 cf
Discarded=0.13 cfs 4,859 cf Primary=0.00 cfs 0 cf Secondary=6.17 cfs 19,351 cf Outflow=6.30 cfs 24,210 cf

Pond 15P: Porous Peak Elev=45.70' Storage=847 cf Inflow=0.44 cfs 3,388 cf
Discarded=0.05 cfs 1,821 cf Primary=0.32 cfs 1,155 cf Outflow=0.37 cfs 2,976 cf

Total Runoff Area = 194,847 sf Runoff Volume = 59,267 cf Average Runoff Depth = 3.65"
90.97% Pervious = 177,258 sf 9.03% Impervious = 17,589 sf

Summary for Subcatchment PRDA#1: PR DA#1

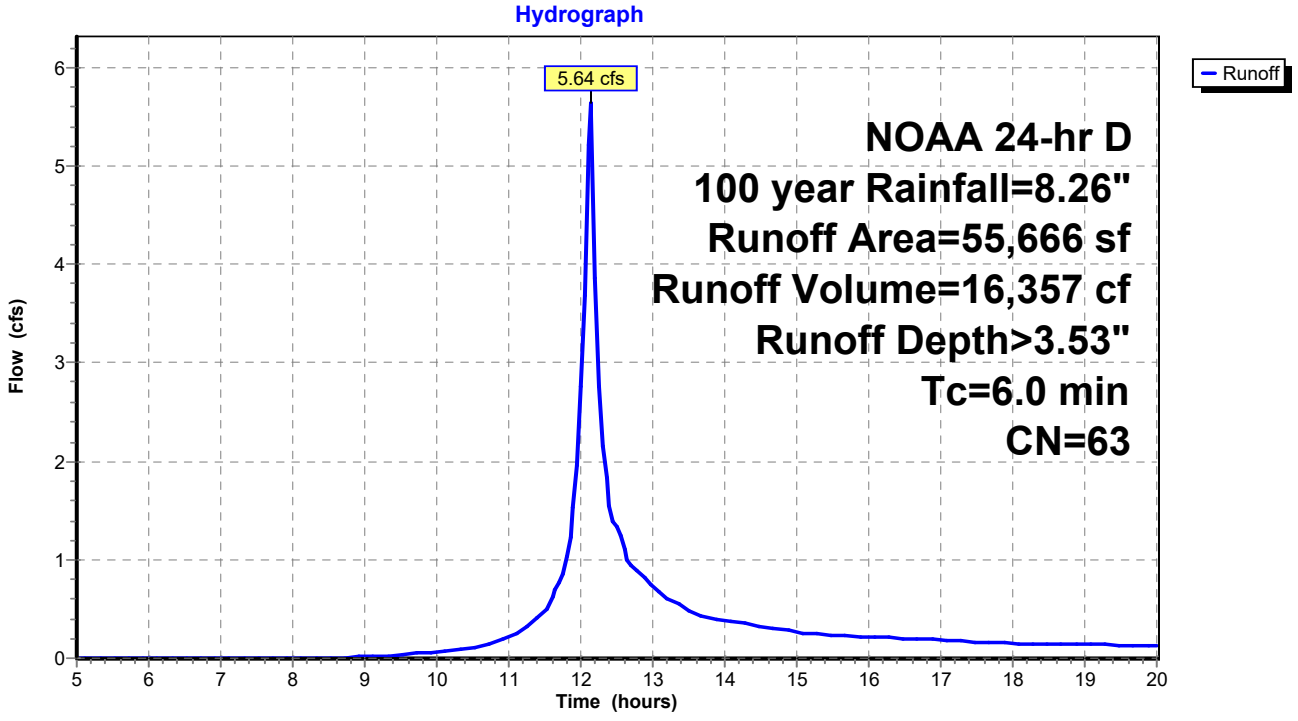
Runoff = 5.64 cfs @ 12.13 hrs, Volume= 16,357 cf, Depth> 3.53"
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Description
3,034	98	Paved parking, HSG B
52,632	61	>75% Grass cover, Good, HSG B
55,666	63	Weighted Average
52,632		94.55% Pervious Area
3,034		5.45% Impervious Area

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

Subcatchment PRDA#1: PR DA#1



Summary for Subcatchment PRDA#2: PR DA#2

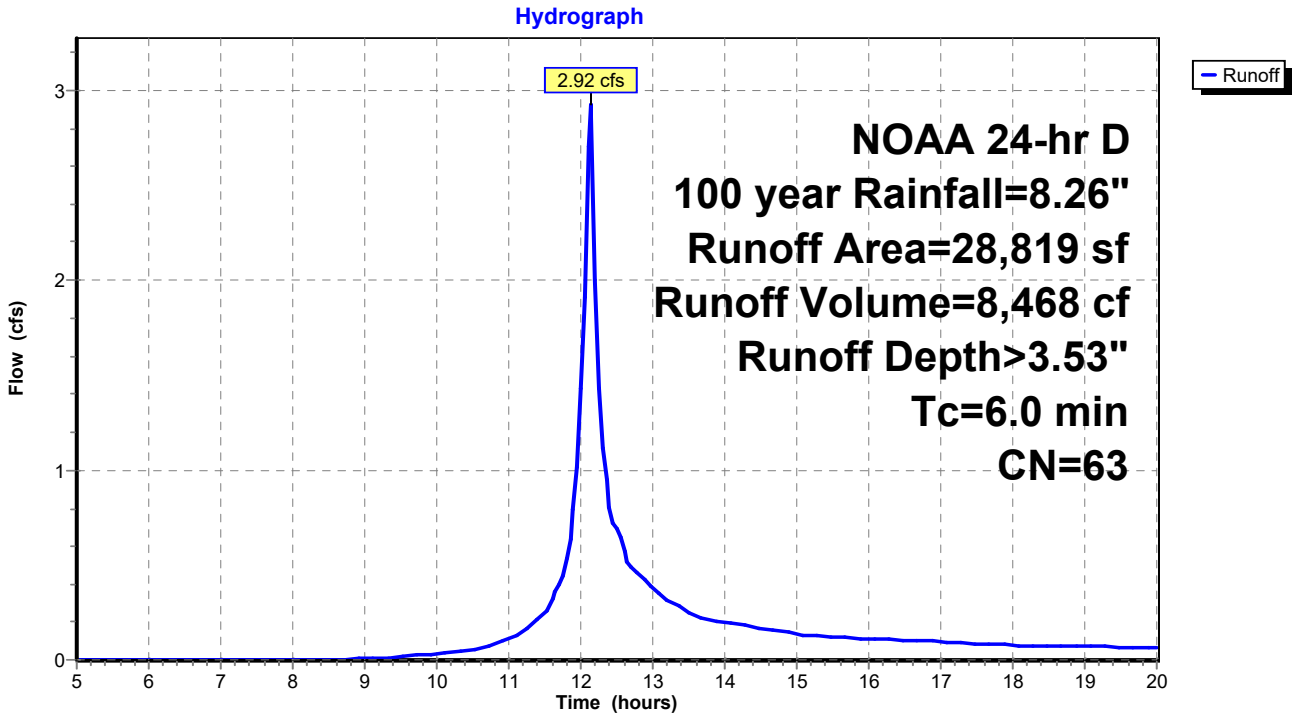
Runoff = 2.92 cfs @ 12.13 hrs, Volume= 8,468 cf, Depth> 3.53"
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Description
27,114	61	>75% Grass cover, Good, HSG B
314	98	Unconnected roofs, HSG B
1,391	98	Paved parking, HSG B
28,819	63	Weighted Average
27,114		94.08% Pervious Area
1,705		5.92% Impervious Area
314		18.42% Unconnected

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

Subcatchment PRDA#2: PR DA#2



Summary for Subcatchment PRDA#3: PR DA#3

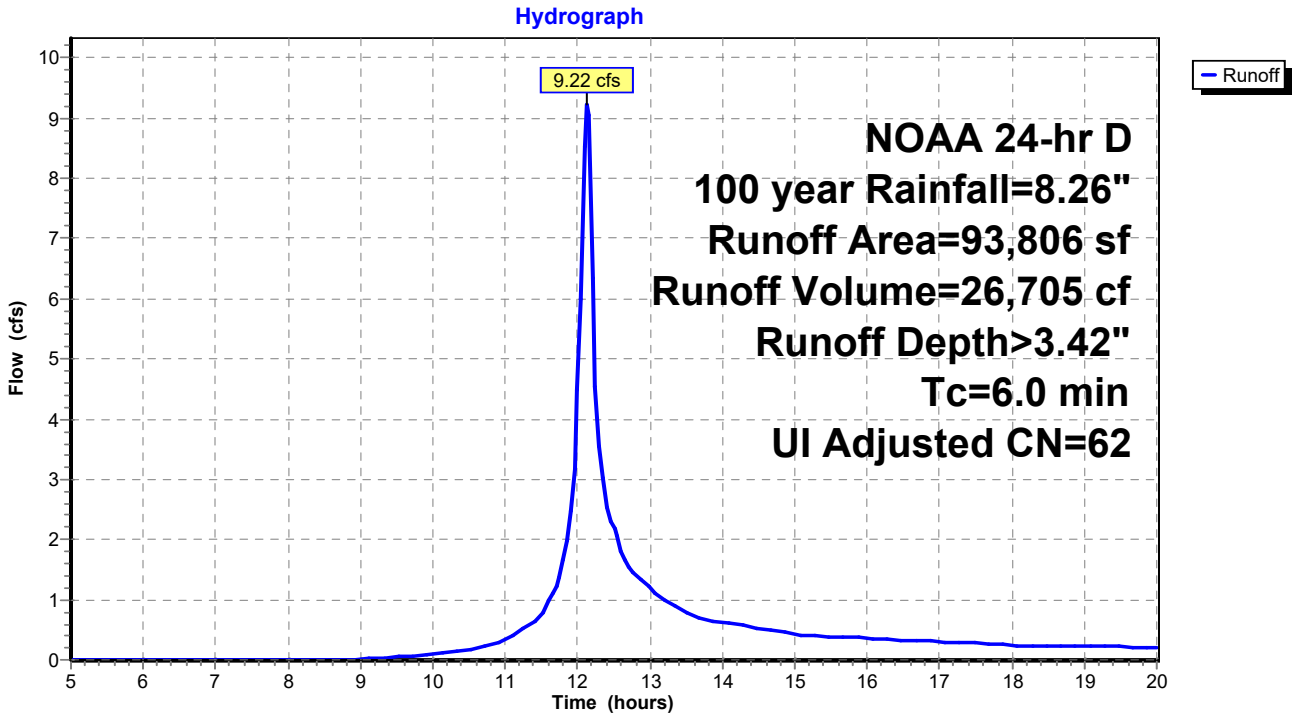
Runoff = 9.22 cfs @ 12.13 hrs, Volume= 26,705 cf, Depth> 3.42"
Routed to Pond 12P : Recharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Adj	Description
5,287	98		Unconnected pavement, HSG B
88,316	61		>75% Grass cover, Good, HSG B
203	98		Unconnected roofs, HSG B
93,806	63	62	Weighted Average, UI Adjusted
88,316			94.15% Pervious Area
5,490			5.85% Impervious Area
5,490			100.00% Unconnected

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

Subcatchment PRDA#3: PR DA#3



Summary for Subcatchment PRDA#4: PR DA#4

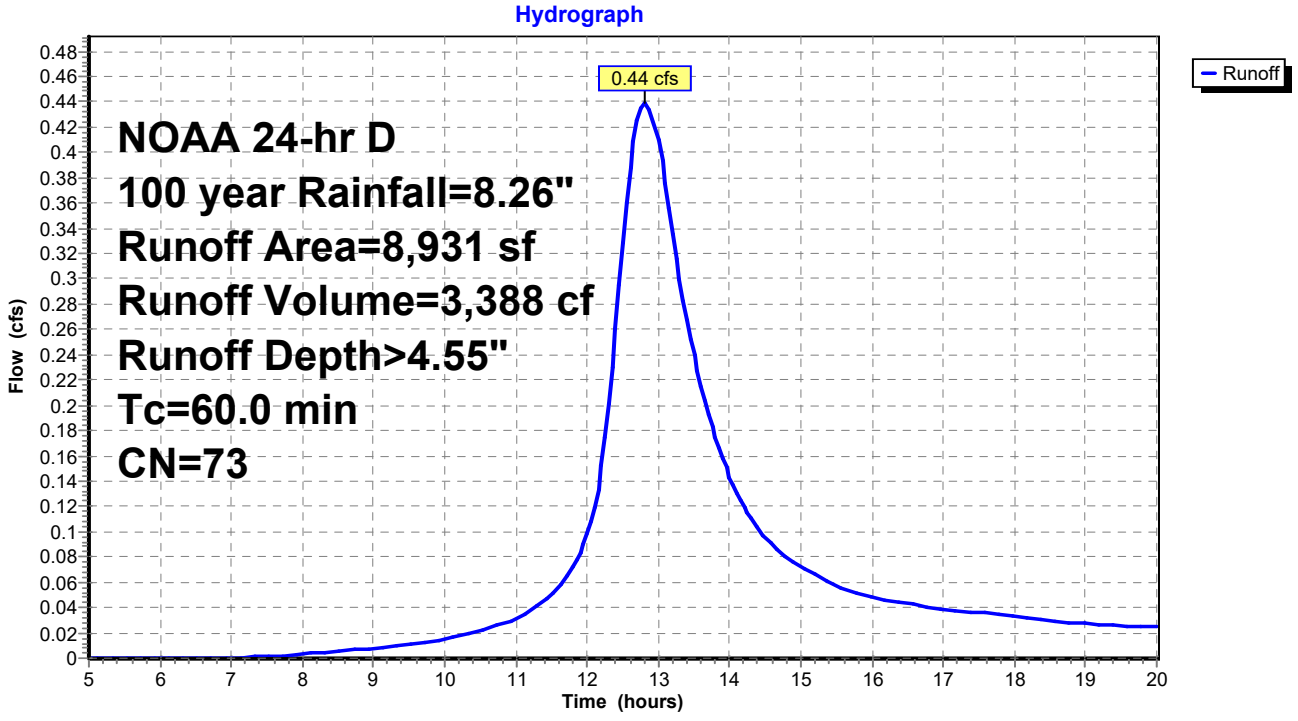
Runoff = 0.44 cfs @ 12.82 hrs, Volume= 3,388 cf, Depth> 4.55"
Routed to Pond 15P : Porous

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Description
1,179	98	Paved parking, HSG B
7,752	69	50-75% Grass cover, Fair, HSG B
8,931	73	Weighted Average
7,752		86.80% Pervious Area
1,179		13.20% Impervious Area

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

Subcatchment PRDA#4: PR DA#4



Summary for Subcatchment PRDA#5: PR DA#5

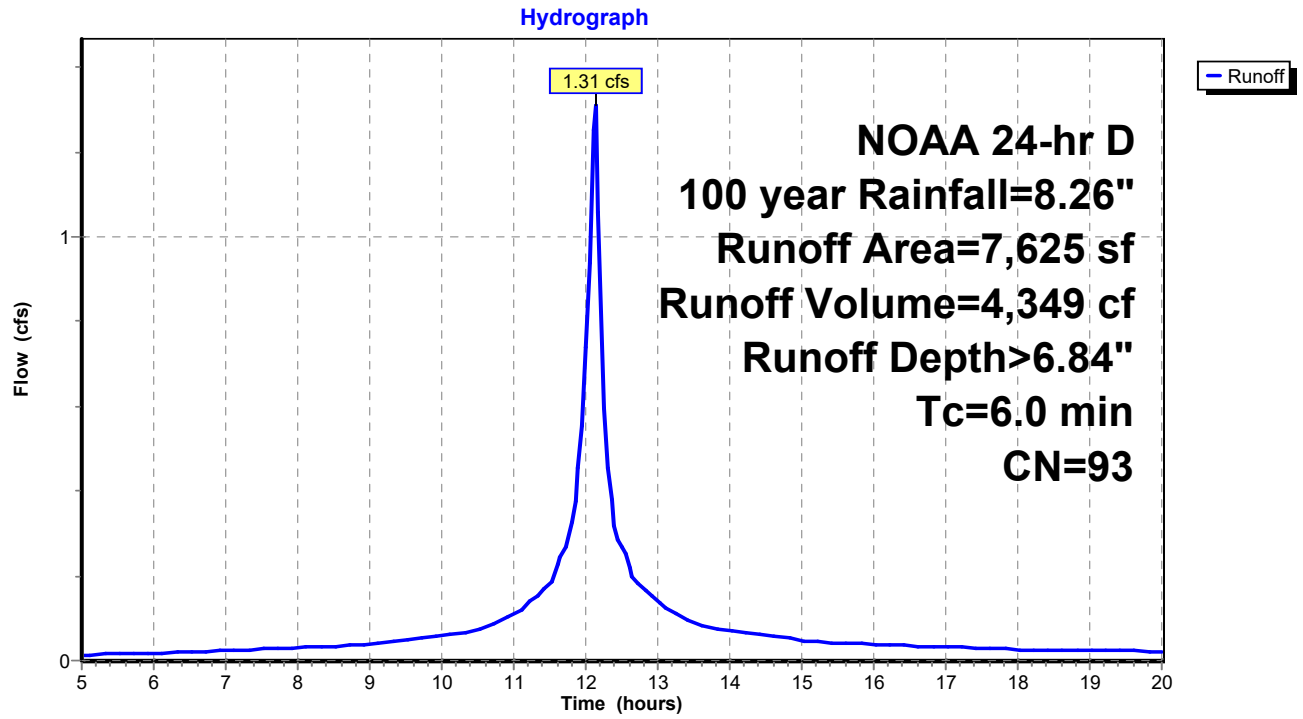
Runoff = 1.31 cfs @ 12.13 hrs, Volume= 4,349 cf, Depth> 6.84"
Routed to Reach PRDP#3 : PRDR #3 (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NOAA 24-hr D 100 year Rainfall=8.26"

Area (sf)	CN	Description
6,181	98	Unconnected pavement, HSG B
1,444	69	50-75% Grass cover, Fair, HSG B
7,625	93	Weighted Average
1,444		18.94% Pervious Area
6,181		81.06% Impervious Area
6,181		100.00% Unconnected

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

Subcatchment PRDA#5: PR DA#5

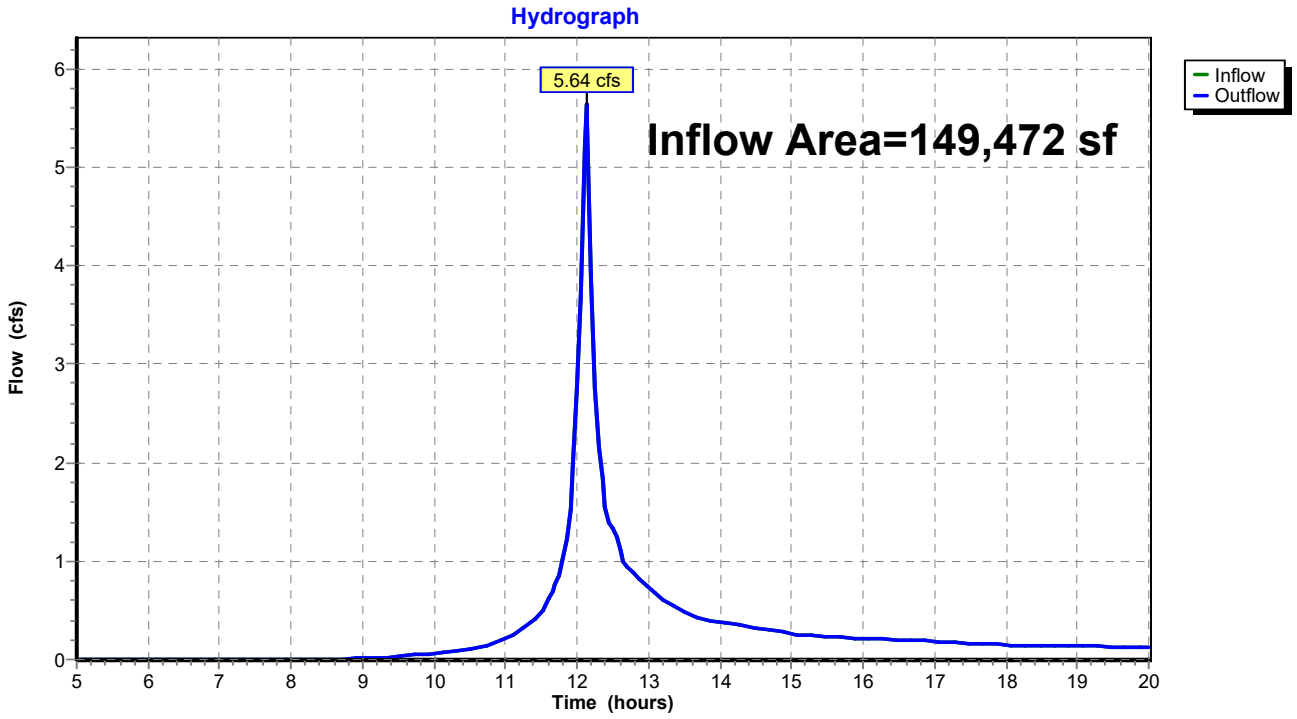


Summary for Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

Inflow Area = 149,472 sf, 5.70% Impervious, Inflow Depth > 1.31" for 100 year event
Inflow = 5.64 cfs @ 12.13 hrs, Volume= 16,357 cf
Outflow = 5.64 cfs @ 12.13 hrs, Volume= 16,357 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#1: PRDP #1 (NORTH SITE WETLAND)

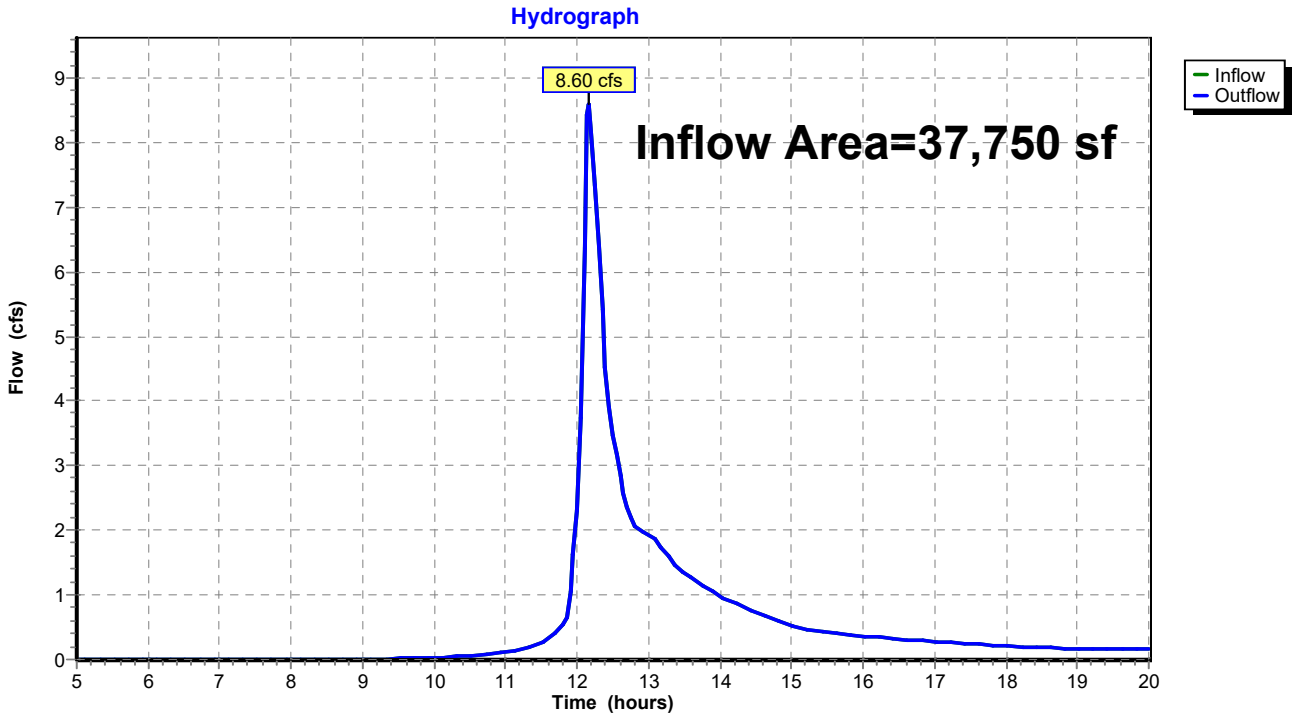


Summary for Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

Inflow Area = 37,750 sf, 7.64% Impervious, Inflow Depth > 9.21" for 100 year event
Inflow = 8.60 cfs @ 12.17 hrs, Volume= 28,974 cf
Outflow = 8.60 cfs @ 12.17 hrs, Volume= 28,974 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#2: PRDP #2 (SOUTH SITE WETLAND)

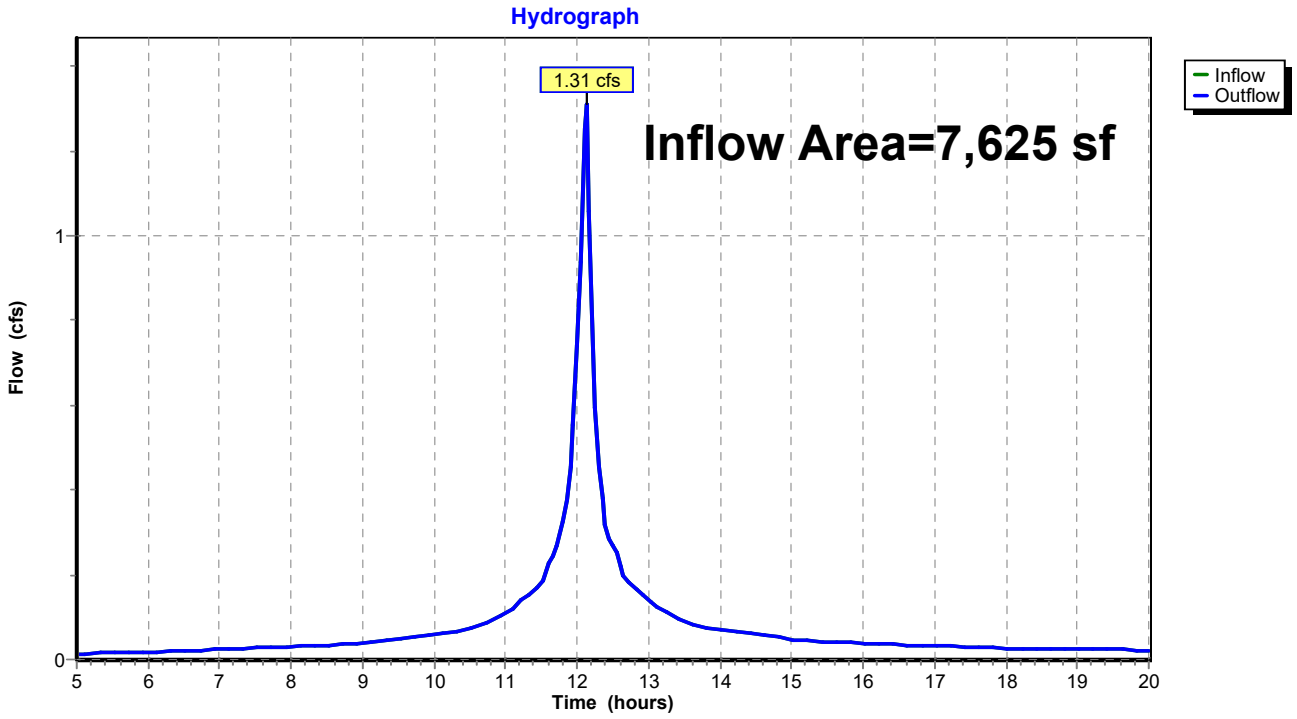


Summary for Reach PRDP#3: PRDR #3 (OFFSITE)

Inflow Area = 7,625 sf, 81.06% Impervious, Inflow Depth > 6.84" for 100 year event
Inflow = 1.31 cfs @ 12.13 hrs, Volume= 4,349 cf
Outflow = 1.31 cfs @ 12.13 hrs, Volume= 4,349 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach PRDP#4 : PRDP#4 CULVERT

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#3: PRDR #3 (OFFSITE)

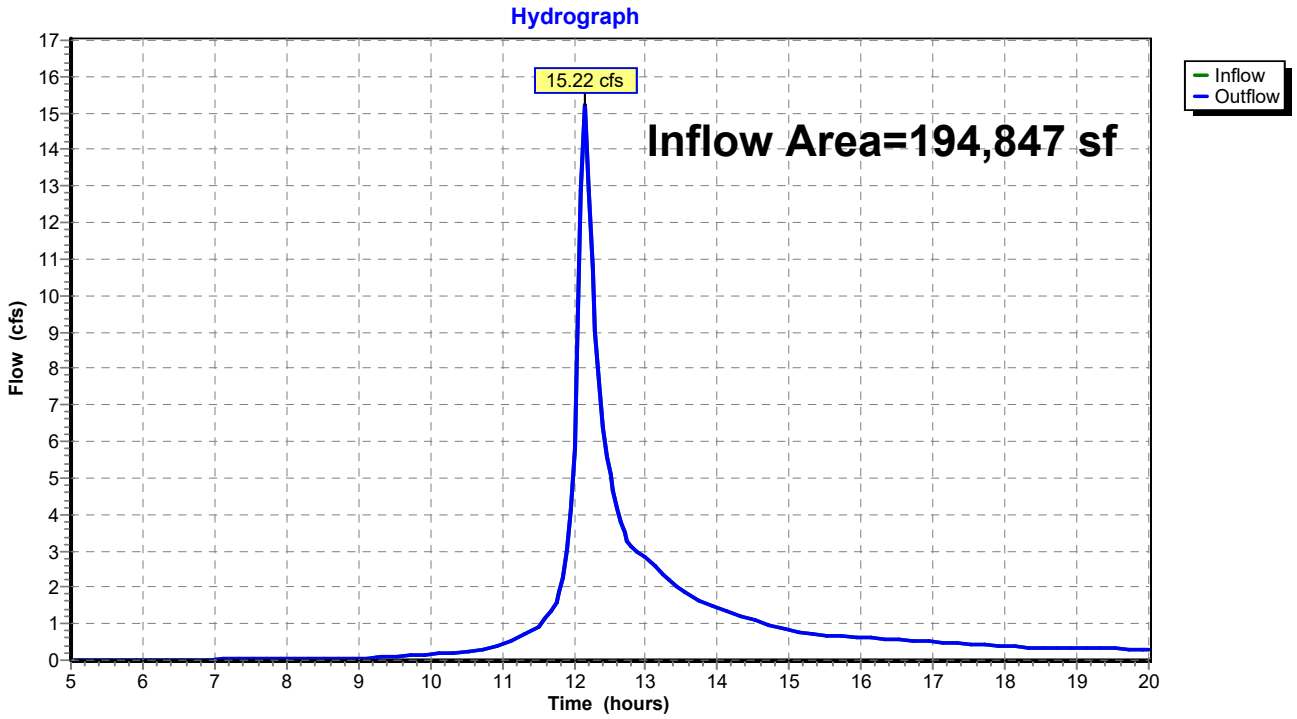


Summary for Reach PRDP#4: PRDP#4 CULVERT

Inflow Area = 194,847 sf, 9.03% Impervious, Inflow Depth > 3.06" for 100 year event
Inflow = 15.22 cfs @ 12.15 hrs, Volume= 49,680 cf
Outflow = 15.22 cfs @ 12.15 hrs, Volume= 49,680 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach PRDP#4: PRDP#4 CULVERT



Summary for Pond 12P: Recharge

Inflow Area = 93,806 sf, 5.85% Impervious, Inflow Depth > 3.42" for 100 year event
Inflow = 9.22 cfs @ 12.13 hrs, Volume= 26,705 cf
Outflow = 6.30 cfs @ 12.21 hrs, Volume= 24,210 cf, Atten= 32%, Lag= 4.6 min
Discarded = 0.13 cfs @ 12.00 hrs, Volume= 4,859 cf
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
Routed to Reach PRDP#1 : PRDP #1 (NORTH SITE WETLAND)
Secondary = 6.17 cfs @ 12.21 hrs, Volume= 19,351 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.86' @ 12.21 hrs Surf.Area= 5,615 sf Storage= 6,112 cf

Plug-Flow detention time= 54.4 min calculated for 24,210 cf (91% of inflow)
Center-of-Mass det. time= 22.9 min (827.2 - 804.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	45.60'	4,862 cf	**5.50'W x 1,020.00'L x 4.50'H Field A** 25,245 cf Overall - 9,038 cf Embedded = 16,207 cf x 30.0% Voids
#2A	46.10'	7,242 cf	**ADS N-12 36"** Inside #1 Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows
#3	47.00'	15 cf	**1.0" Round Pipe Storage** L= 2,830.0' S= 0.0010 '/'
		12,119 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Secondary	48.10'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	46.80'	**24.0" W x 2.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	47.20'	**36.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Discarded	45.60'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.13 cfs @ 12.00 hrs HW=47.19' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.60' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=6.10 cfs @ 12.21 hrs HW=47.86' (Free Discharge)
├**2=Orifice/Grate** (Controls 0.00 cfs)
├**3=Orifice/Grate** (Orifice Controls 1.58 cfs @ 4.75 fps)
└**4=Orifice/Grate** (Orifice Controls 4.52 cfs @ 3.01 fps)

Pond 12P: Recharge - Chamber Wizard Field A

Chamber Model = ADS N-12 36" (ADS N-12® Pipe)
Inside= 36.1"W x 36.1"H => 7.10 sf x 20.00'L = 142.0 cf
Outside= 42.0"W x 42.0"H => 8.86 sf x 20.00'L = 177.1 cf
Row Length Adjustment= +1,000.00' x 7.10 sf x 1 rows

1 Chambers/Row x 20.00' Long +1,000.00' Row Adjustment = 1,020.00' Row Length
1 Rows x 42.0" Wide + 12.0" Side Stone x 2 = 5.50' Base Width
6.0" Stone Base + 42.0" Chamber Height + 6.0" Stone Cover = 4.50' Field Height

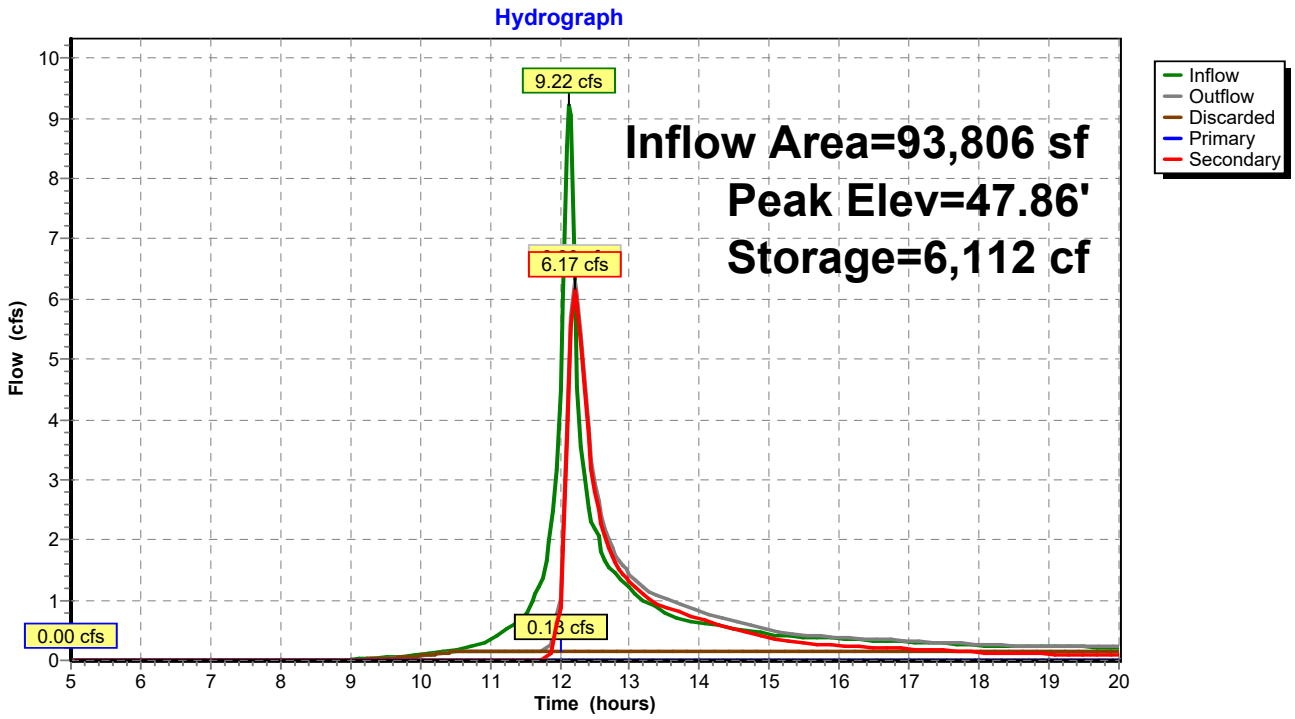
1 Chambers x 142.0 cf +1,000.00' Row Adjustment x 7.10 sf x 1 Rows = 7,242.0 cf Chamber Storage
1 Chambers x 177.1 cf +1,000.00' Row Adjustment x 8.86 sf x 1 Rows = 9,034.4 cf Displacement

25,244.9 cf Field - 9,034.4 cf Chambers = 16,210.5 cf Stone x 30.0% Voids = 4,863.2 cf Stone Storage

Chamber Storage + Stone Storage = 12,105.2 cf = 0.278 af
Overall Storage Efficiency = 48.0%
Overall System Size = 1,020.00' x 5.50' x 4.50'

1 Chambers
935.0 cy Field
600.4 cy Stone

Pond 12P: Recharge



Summary for Pond 15P: Porous

Inflow Area = 8,931 sf, 13.20% Impervious, Inflow Depth > 4.55" for 100 year event
Inflow = 0.44 cfs @ 12.82 hrs, Volume= 3,388 cf
Outflow = 0.37 cfs @ 13.11 hrs, Volume= 2,976 cf, Atten= 15%, Lag= 17.4 min
Discarded = 0.05 cfs @ 16.80 hrs, Volume= 1,821 cf
Primary = 0.32 cfs @ 13.11 hrs, Volume= 1,155 cf
Routed to Reach PRDP#2 : PRDP #2 (SOUTH SITE WETLAND)

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 45.70' @ 13.11 hrs Surf.Area= 2,205 sf Storage= 847 cf

Plug-Flow detention time= 83.6 min calculated for 2,976 cf (88% of inflow)
Center-of-Mass det. time= 48.0 min (873.8 - 825.8)

Volume	Invert	Avail.Storage	Storage Description
#1	44.83'	18 cf	**6.0" Round Pipe Storage** L= 90.0' S= 0.0050 '/'
#2	44.32'	1,508 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		1,525 cf	Total Available Storage

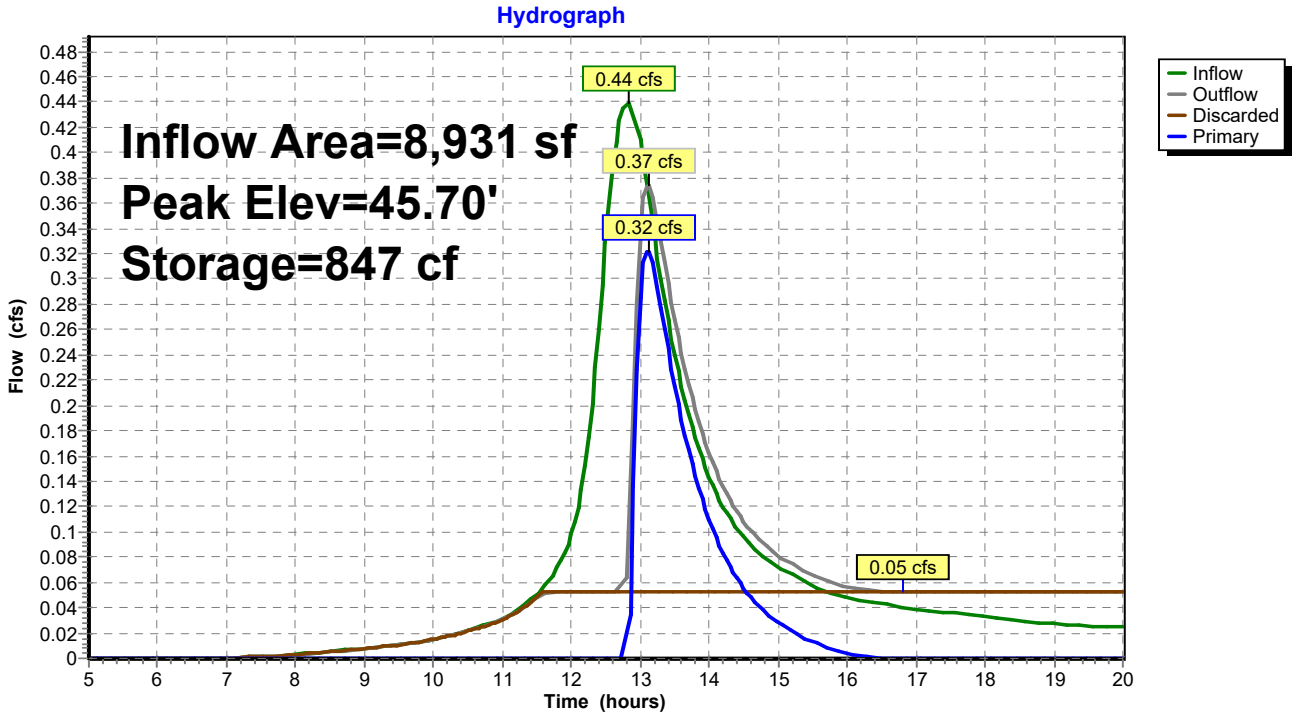
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.32	2,201	0.0	0	0
44.33	2,201	30.0	7	7
45.33	2,201	30.0	660	667
47.24	2,201	20.0	841	1,508

Device	Routing	Invert	Outlet Devices
#1	Primary	45.33'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	44.32'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 16.80 hrs HW=45.31' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.32 cfs @ 13.11 hrs HW=45.70' (Free Discharge)
↑—**1=Orifice/Grate** (Orifice Controls 0.32 cfs @ 2.07 fps)

Pond 15P: Porous



APPENDIX D

Long-Term Pollution Prevention and Stormwater Operation and Maintenance Plan

LONG-TERM POLLUTION PREVENTION PLAN AND STORMWATER OPERATION AND MAINTENANCE PLAN

Olmsted Green Community Field: 550 Morton Street, Boston, MA

TABLE OF CONTENTS

INTRODUCTION

The purpose of this document is to specify the pollution prevention measures and stormwater management system operation and maintenance for the Olmsted Green site located at 550 Morton Street, Boston, MA 02131. The Responsible Party indicated below shall implement the management practices outlined in this document and proactively conduct operations at the project site in an environmentally responsible manner. Compliance with this Manual does not in any way dismiss the responsible party, owner, property manager, or occupants from compliance with other applicable federal, state or local laws.

Responsible Party: Brooke Charter Schools
Mark Loring
190 Cummins Highway, Roslindale, MA 02131
(704)351-5066

This Document has been prepared in compliance with Standards 4 and 9 of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards, which state:

Standard 4:
The Long Term Pollution Prevention Plan shall include the proper procedures for the following:

- Good housekeeping
- Storing materials and waste products inside or under cover
- Vehicle washing
- Routine inspections of stormwater best management practices
- Spill prevention and response
- Maintenance of lawns, gardens, and other landscaped areas
- Pet waste management
- Operation and management of septic systems
- Proper management of deicing chemicals and snow

Standard 9:
The Long-Term Operation and Maintenance Plan shall at a minimum include:

- Stormwater management system(s) owner(s)
- The party or parties responsible for operation and maintenance, including how future property owners shall be notified of the presence of the stormwater management system and the requirement for operation and maintenance
- The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks
- A plan that is drawn to scale and shows the location of all stormwater BMPs in each treatment train along with the discharge point
- A description of public safety features
- An estimated operations and maintenance budget

1.0 LONG-TERM POLLUTION PREVENTION PLAN

The Responsible Party shall implement the following good housekeeping procedures at the project site to reduce the possibility of accidental releases and to reduce safety hazards.

1.1 Storage of Hazardous Materials

To prevent leaks and spills, keep hazardous materials and waste products under cover or inside. Use drip pans or spill containment systems to prevent chemicals from entering the drainage system. Inspect storage areas for materials and waste products at least once per year to determine amount and type of the material on site, and if the material requires disposal.

Securely store liquid petroleum products and other liquid chemicals in federally- and state-approved containers. Restrict access to maintenance personnel and administrators.

1.2 Storage of Waste Products

Collect and store all waste materials in securely lidded dumpster(s) or other secure containers as applicable to the material. Keep dumpster lids closed and the areas around them clean. Do not fill the dumpsters with liquid waste or hose them out. Sweep areas around the dumpster regularly and put the debris in the garbage, instead of sweeping or hosing it into the parking lot. Legally dispose of collected waste on a regular basis.

Segregate liquid wastes, including motor oil, antifreeze, solvents, and lubricants, from solid waste and recycle through hazardous waste disposal companies, whenever possible. Separate oil filters, batteries, tires, and metal filings from grinding and polishing metal parts from common trash items and recycle. These items are not trash and are illegal to dump. Contact a hazardous waste hauler for proper disposal to a hazardous waste collection center.

1.3 Spill Prevention and Response

Implement spill response procedures for releases of significant materials such as fuels, oils, or chemical materials onto the ground or other area that could reasonably be expected to discharge to surface or groundwater.

- For minor spills, keep fifty (50) gallon spill control kits and Speedy Dry at all shop and work areas.
- Immediately contact applicable Federal, State, and local agencies for reportable quantities as required by law.
- Immediately perform applicable containment and cleanup procedures following a spill release.
- Promptly remove and dispose of all material collected during the response in accordance with Federal, State and local requirements. A licensed emergency response contractor may be required to assist in cleanup of releases depending on the amount of the release, and the ability of the Contractor to perform the required response.
- Reportable quantities of chemicals, fuels, or oils are established under the Clean Water Act and enforced through Massachusetts Department of Environmental Protection (DEP).

1.4 Minimize Soil Erosion

Soil erosion facilitates mechanical transport of nutrients, pathogens, and organic matter to surface water bodies. Repair all areas where erosion is occurring throughout the project site. Stabilize bare soil with riprap, seed, mulch, or vegetation.

1.5 Vehicle Washing

Vehicle washing will occur within the covered service area. The car wash will be a state-of-the art system that will reclaim and reuse water for the car wash operation. Eventual discharge of the wash water will be directed to the sanitary sewer.

1.6 Maintenance of Lawns, Gardens, and other Landscaped Areas

Pesticides and fertilizers shall not be used in the landscaped areas associated with the project site and shall not be stored on-site. Dumping of lawn wastes, brush or leaves or other materials or debris is not permitted in any Resource Area. Grass clippings, pruned branches and any other landscaped waste should be disposed of or composted in an appropriate location. No irrigation shall be used in the landscaped areas for this project.

1.7 Management of Deicing Chemicals and Snow

The qualified contractor selected for snow plowing and deicing shall be made fully aware of the requirements of this section.

No road salt (sodium chloride) shall be stored on-site. The use of magnesium chloride de-icing product with a 0.5 to 1.0 percent sodium chloride mix for snow and ice treatment is permitted. The product shall be stored in a locked room inside the building and shall be used at exterior stairs and walkways. The snow plow contractor shall adhere to these magnesium chloride use and storage requirements.

Snow shall not be stockpiled in wetland resource areas or the 100-foot Buffer Zone. In severe conditions where snow cannot be stockpiled on site, the snow shall be removed from the site and properly disposed of in accordance with DEP Guideline BRP601-01.

Use of sand is permitted only for impervious roadways and parking areas. If sand is applied, the snow plowed from impervious areas shall not be stored on porous asphalt.

Porous pavement areas are proposed throughout the site. These areas will be delineated on-site using pavement markings. Porous pavement performs well in cold climates and can reduce meltwater runoff during the snowmelt period; however, there are specific winter management techniques that must be followed for porous pavement systems.

The porous pavement areas shall be maintained during snow events as provided below:

- Apply anti-icing treatments only when absolutely necessary (in extreme events). It is not anticipated that deicing chemicals will be required for typical winter events.
- Plow as needed after storm events. Avoid scarifying the porous pavement surface. Special plow blades should be used whenever possible. Raised blade is not recommended.
- Apply the minimum amount of deicing agents during and after storms required to control compact snow and ice that are not removed by plowing.
- Do not apply sand in porous pavement areas “No Sanding” signs shall be posted before the first snowfall and maintenance and snow removal contractors shall be made aware of this requirement.

Before winter begins, the property owner and the contractor shall review snow plowing, deicing, and stockpiling procedures. Areas designated for stockpiling should be cleaned of any debris. Street and parking lot sweeping should be followed in accordance with the Operation and Maintenance Plan.

1.8 Coordination with other Permits and Requirements

Certain conditions of other approvals affecting the long term management of the property shall be considered part of this Long Term Pollution Prevention Plan. The Owner shall become familiar with those documents and comply with the guidelines set forth in those documents.

2.0 STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN

2.1 Introduction

This Operation and Maintenance Plan (O&M Plan) for the Olmsted Green Community Field site is required under Standard 9 of the 2008 MassDEP Stormwater Handbook to provide best management practices for implementing maintenance activities for the stormwater management system in a manner that minimizes impacts to wetland resource areas.

The Owner shall implement this O&M Plan and proactively conduct operations at the site in an environmentally responsible manner. Compliance with this O&M Plan does not in any way dismiss the Owner from compliance with other applicable Federal, State or local laws.

Routine maintenance during construction and post-development phases of the project, as defined in the Operation and Maintenance Plan, shall be permitted without amendment to the Order of Conditions. A continuing condition in the Certificate of Compliance shall ensure that maintenance can be performed without triggering further filings under the Wetlands Protection Act.

All stormwater best management practices (BMPs) shall be operated and maintained in accordance with the design plans and the Operation and Maintenance Plan approved by the issuing authority. The Owner shall:

a. Maintain an operation and maintenance log for the last three years, including inspections, repairs, replacement and disposal (for disposal the log shall indicate the type of material and the disposal location). This is a rolling log in which the responsible party records all operation and maintenance activities for the past three years.

b. Make this log available to MassDEP and the Conservation Commissions upon request; and

c. Allow members and agents of the MassDEP and the Conservation Commissions to enter and inspect the premises to evaluate and ensure that the Owner complies with the Operation and Maintenance requirements for each BMP.

2.2 Stormwater Operation and Maintenance Requirements

Inspect and maintain the stormwater management system as directed below. For the location of each component of the system. Repairs to any component of the system shall be made as soon as possible to prevent any potential pollutants (including silt) from entering the resource areas.

<u>Porous Pavement</u>

Porous pavement areas are proposed throughout the site. These areas will be delineated on-site using pavement markings.

Frequent cleaning and maintenance of the porous pavement surface is critical to prevent clogging. Frequent vacuum sweeping along with jet washing of porous pavement is required. No winter sanding shall be conducted on the porous surface. For proper maintenance:

- Minimize salt use during winter months.
- No winter sanding is allowed.
- Keep landscaped areas well maintained to prevent soil from being transported onto the pavement.
- Regularly monitor the porous pavement surface to check for deterioration and make sure that it drains properly after storm events.
- Clean the surface of each porous pavement area using vacuum sweeping as required to keep the pavement functioning as designed. At a minimum, the porous pavement shall be cleaned after the winter season and every three months thereafter. This requirement may be adjusted as needed, based on regular visual inspections of the porous pavement surface.
- Never reseal or repave with impermeable materials.
- Once per year, the infiltrative capacity of the porous pavement should be tested by running a

hose over each porous pavement area for 30 minutes.

- Sections of damaged porous asphalt (rutting, etc.) can be repaired by heating and rerolling the asphalt.
- When infiltrative capacity of porous pavement is reduced to less than the design rate, the porous pavement shall be replaced by milling to the choker course.

2.3 Street Sweeping

Perform street sweeping at least twice per year, whenever there is significant debris present on roads and parking lots. Street sweeping shall occur in the spring and fall. Sweepings must be handled and disposed of properly according to the Boston Conservation Commission.

2.4 Repair of the Stormwater Management System

The stormwater management system shall be maintained. The repair of any component of the system shall be made as soon as possible to prevent any potential pollutants including silt from entering the resource areas or the existing closed drainage system.

2.5 Reporting

The Owner shall maintain a record of drainage system inspections and maintenance (per this Plan) and submit a yearly report to the Boston Conservation Commission.

STORMWATER MANAGEMENT SYSTEM INSPECTION FORM

550 Morton Street,
Olmsted Green Community Field
Boston, MA 02131

Inspected by:_____
Date:_____

Component	Status/Inspection	Action Taken
Porous Asphalt		
Stormwater Outfalls & Level Spreaders		
General site conditions – evidence of erosion, etc.		

SUBMIT COPIES OF STORMWATER MANAGEMENT SYSTEM INSPECTION FORM TO THE BOSTON CONSERVATION COMMISSIONS WITH THE YEARLY REPORT.

APPENDIX E

Soil Investigations

NRCS Soil Maps and Descriptions
Geotechnical Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Norfolk and Suffolk Counties, Massachusetts

March 15, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

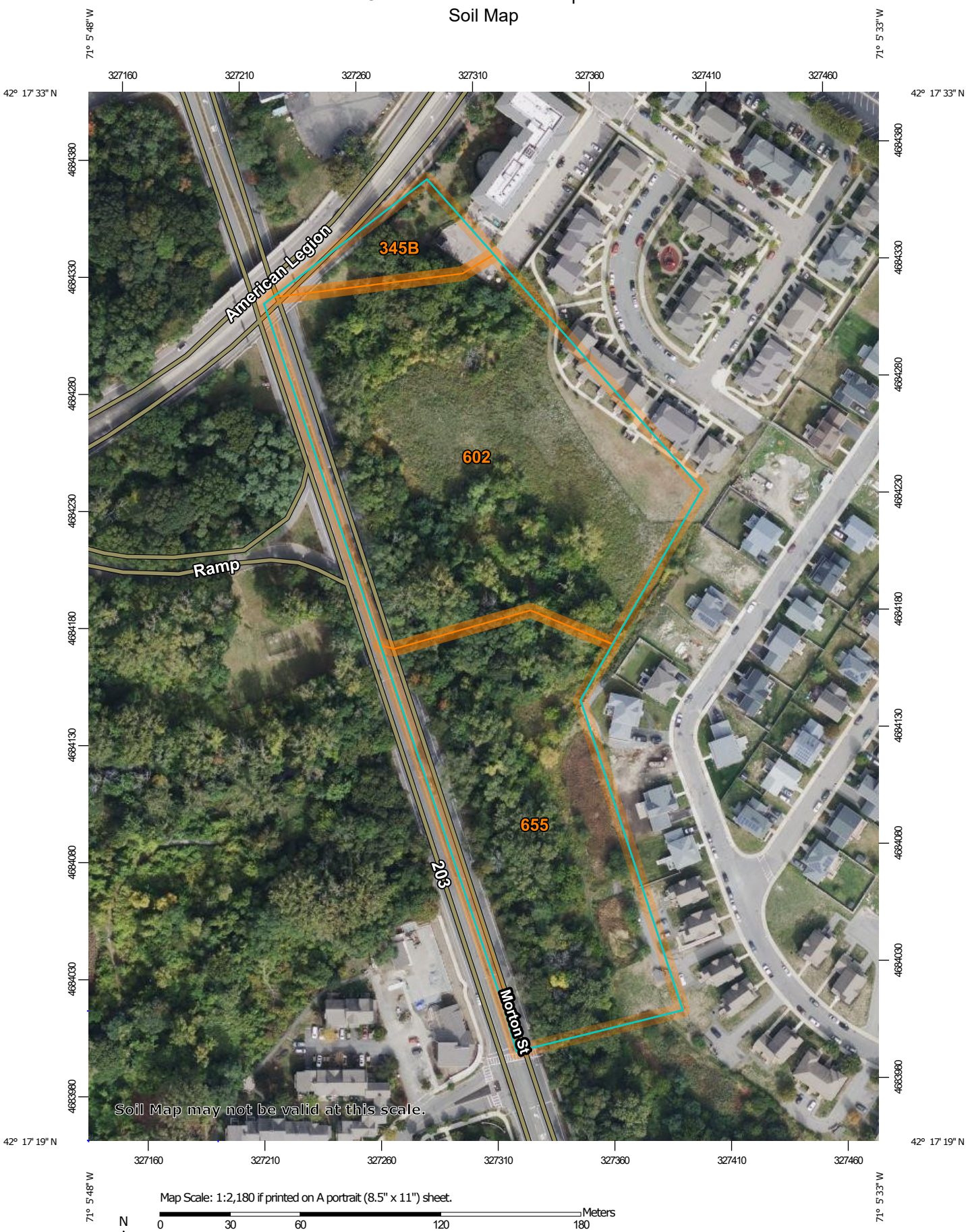
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,180 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N 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 1:25,000.

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: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

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

Date(s) aerial images were photographed: Aug 13, 2020—Oct 18, 2020

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
345B	Pittstown silt loam, 2 to 8 percent slopes	0.5	5.7%
602	Urban land, 0 to 15 percent slopes	5.0	56.2%
655	Udorthents, wet substratum	3.4	38.1%
Totals for Area of Interest		**8.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Norfolk and Suffolk Counties, Massachusetts

345B—Pittstown silt loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: vkxf
Elevation: 0 to 260 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Pittstown and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pittstown

Setting

Landform: Drumlins
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from metamorphic rock

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 15 to 30 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY037MA - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Newport

Percent of map unit: 15 percent
Hydric soil rating: No

Udorthents
Percent of map unit: 5 percent
Hydric soil rating: Unranked

602—Urban land, 0 to 15 percent slopes

Map Unit Setting
National map unit symbol: vkyj
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Urban land: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting
Parent material: Excavated and filled land

Minor Components

Rock outcrops
Percent of map unit: 1 percent
Hydric soil rating: Unranked

655—Udorthents, wet substratum

Map Unit Setting
National map unit symbol: vkyd
Elevation: -30 to 310 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Riser, tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Excavated and filled sandy and gravelly human transported material over highly-decomposed herbaceous organic material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Urban land

Percent of map unit: 3 percent
Hydric soil rating: Unranked

Ipswich

Percent of map unit: 2 percent
Landform: Marshes
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

May 28, 2021

Lena New Boston, LLC
c/o New Boston Fund
1700 District Avenue, Suite 310
Burlington, MA 01803

Attention: Mr. Eric VanDusen

Reference: Olmsted Green Development – Sports Fields; Boston, Massachusetts
Summary of Subsurface Exploration and Laboratory Testing

This letter documents the results of our subsurface exploration program and soil assessment performed for the proposed Olmsted Green Sports Fields in Boston, Massachusetts. This letter was prepared in accordance with our proposal dated March 8, 2021 and the subsequent authorization of Lena New Boston, LLC. These services are subject to the limitations contained in **Appendix A**.

The purpose of the subsurface exploration program was to document the existing subsurface soil, groundwater, and bedrock conditions to assess the suitability of the existing soils for re-use at the site, determine the permeability of the site soils as it pertains to the drainage of the proposed sports fields, and to provide foundation recommendations for the proposed stand-alone storage structure adjacent to the field.

Background

Located southeast of the intersection of American Legion Highway and Morton Street, the subject site consists of a wooded, undeveloped parcel which is generally bounded to the east and south by residential neighborhoods. It is understood that the residential neighborhoods located to the east along Osprey Way and Sandpiper Lane were constructed as part of a previous phase of the Olmsted Green development. Existing site grades are highly variable, with several slopes and knolls across the site and ground surface varying from approximately Elevation +47 to Elevation +57.

It is understood that the development of the site involves the construction of a 180-foot by 300-foot soccer field with an overlain softball field, as well as associated seating and site improvements, including retaining walls. As part of the proposed construction, it is understood that an approximate 1,250 square-foot storage building is planned to be constructed south east of the proposed sports fields.

Subsurface Explorations

A subsurface exploration program consisting of six (6) test pits was conducted at the site on May 4, 2021 by Lederman Engineering, Inc. under contract to McPhail Associates, LLC (McPhail). Approximate locations of the test pits are indicated on the attached Subsurface

Exploration Plan, **Figure 1**. Logs of the test pits prepared by McPhail are contained in **Appendix B**.

The test pits were performed with a track-mounted excavator and were typically advanced to depths ranging from 5 to 10 feet below the existing ground surface. It is noted that test pit TP-1 encountered refusal on concrete foundation remains, so additional test pits (identified as TP-1A and TP-1B) were performed approximately 5 and 10 feet away from the original location, respectively, both of which encountered refusal on foundation remains at similar depths.

The test pits were monitored by a McPhail representative who prepared field logs, obtained and visually classified soil samples, made minor adjustments of the test pit locations as needed, and determined the required exploration depths based upon the actual subsurface conditions encountered. Field locations of the subsurface explorations were performed by Feldman Land Surveyors under contract to others.

Laboratory Testing

At the completion of the field work, soil samples were returned to our laboratory for more detailed classification, analysis, and testing. The laboratory testing consisted of sieve analyses to determine the gradation and confirm the visual classifications of the existing site soils. Laboratory test procedures were performed in general accordance with applicable ASTM Standards. The results of the gradation testing appear on **Figure 2** and **Figure 3** following the text of this letter.

Subsurface Conditions

A detailed description of the subsurface conditions encountered within the explorations is documented on the test pit logs contained in **Appendix B**. Approximate locations of the test pits are indicated on the enclosed Subsurface Exploration Plan, **Figure 1**.

Based on the subsurface explorations, our laboratory testing, and our general knowledge of the geology of the surrounding area, the following is a description of the generalized subsurface conditions across the site encountered from ground surface downward.

With the exception of test pit TP-4, where surficial fill soil was observed, surface treatments observed in the test pits consisted of a 4 to 12-inch thickness of topsoil. Underlying the topsoil, or constituting ground surface in TP-4, the test pits encountered an urban fill deposit which was observed to extend to depths between 5 and 10 feet below existing ground surface. In general, the fill deposit was observed to consist of a loose to dense, brown to black, silty, sandy gravel, varying to a gravelly sand with some silt. The fill material at the site was also observed to contain varying quantities of cobbles, brick,

concrete, steel reinforcing bar, organic materials, glass, ash and cinders. The results of gradation testing performed on samples of the fill material appear on **Figure 2**.

Test pits TP-2 through TP-4 were terminated within the fill material at depths ranging from 7 to 10 feet below existing ground surface. As outlined above, test pit TP-1 encountered refusal on concrete foundation remains within the fill material, so additional test pits (identified as TP-1A and TP-1B) were performed approximately 5 and 10 feet away from the original location, respectively, both of which encountered refusal on foundation remains at similar depths.

Test pit TP-5 encountered a natural glacial till deposit underlying the fill material at a depth of 5 feet below existing ground surface. The glacial till was observed to consist of a dense, gray, silty, gravelly sand with trace clay. The results of gradation testing performed on a sample of the glacial till material appear on **Figure 3**. TP-5 was terminated within the glacial till deposit at a depth of 6 feet below existing ground surface.

Test pit TP-6 encountered excavator refusal at a depth of 10 feet below existing ground surface on what is anticipated to be the surface of the underlying bedrock. Groundwater was observed in test pits TP-5 and TP-6 at depths of 5 and 6 feet below existing ground surface, respectively. It is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, runoff particularly during or following periods of heavy precipitation, and alterations of existing drainage patterns. Furthermore, it is anticipated that groundwater may become seasonally perched on the surface of the relatively impervious glacial till or bedrock deposits which underlie the site.

Permeability Analysis

Based on the laboratory grain-size distributions of soil samples obtained from the test pits, the soil texture class was determined using the USDA textural triangle. The soil texture class was then used to determine the Rawls Infiltration Rates. It is understood that the Rawls Infiltration Rates are based on research performed by Rawls, Brakensiek and Sexton in 1982 which used laboratory permeability testing to develop a relationship between texture class and saturated permeability.

In addition, McPhail estimated the coefficient of permeability of the soils at the site using empirical correlations based on laboratory grain-size distribution using the Kozeny-Carmen method. The Kozeny-Carmen method involves the use of parameters such as void ratio, particle shape and density, which are estimated from the test pit data and the representative laboratory grain size analyses.

As outlined above, the following table provides permeability related recommendations for the site soils based up McPhail's analyses:

Material	Test Pit No.	Sample Depth	Soil Textural Class	Rawls Rate (in/hr)	Recommended Coefficient of Permeability Range (cm/s)
Fill	TP-1	0.3′ – 5′	Sandy Loam	1.02	1×10^{-3} to 1×10^{-4}
	TP-1B	0.3′ – 7′	Loamy Sand	2.41	
	TP-2	0.3′ – 7′	Sandy Loam	1.02	
	TP-3	0.3′ – 6′	Sandy Loam	1.02	
	TP-4	0.3′ – 8′	Sandy Loam	1.02	
	TP-6	0.5′ – 10′	Loamy Sand	2.41	
Glacial Till	TP-5	5′ – 6′	Sandy Loam	1.02	5×10^{-4} to 1×10^{-5}

It should be noted that the existing site soils are heterogeneous in composition and variable in density, thus, it is anticipated that the coefficient of permeability may be highly variable (especially within the fill deposit) and the results of our permeability testing may not be representative of all soils across the site.

Foundation Design Recommendations

Based on our current understanding of the proposed development, it is understood that a single-story storage building is planned to be constructed southeast of the proposed sports fields. Based upon the subsurface conditions encountered at the site, it is recommended that foundation support for the proposed structure consist of conventional spread footing foundations in conjunction with slab-on-grade construction. Furthermore, it is noted that the recommendations contained herein are applicable to the design of all footings associated with the proposed site retaining walls. Specific foundation design recommendations are contained below.

The uncontrolled fill located above the glacial till and bedrock is unsuitable for footing support in its current condition. As such, any footings, and thickened or haunched slabs that support vertical load, should bear directly on the natural inorganic glacial till deposit or bedrock, on compacted structural fill placed over the natural glacial till deposit or bedrock, or on lean concrete placed directly over the natural glacial till deposit or bedrock. For continuity of footing design for the various subsurface conditions, a design bearing pressure of 3 tons per square-foot (tsf) is recommended. Recommended minimum footing widths for continuous and isolated spread footings are 24 and 30 inches, respectively.

All footings in unheated areas should be provided with a minimum 4-foot thickness of soil cover as frost protection. Interior foundations should be located such that the top of the foundation concrete is a minimum of 6 inches below the underside of the lowest level slab.

All foundations should be located such that they bear below a theoretical line drawn upward and outward at 2 to 1 (horizontal to vertical) from the bottom exterior edge of all adjacent footings, structures and utilities.

Based upon the depth to the bedrock observed in test pit TP-6, and the size of the proposed storage building, it is anticipated that bulk excavation of the proposed building footprint will be more efficient than isolated excavation for foundation bearing surfaces. As such, it is recommended that preparation of the bearing surfaces for support of the spread footings and the slabs-on-grade include the removal of all topsoil and existing fill within the proposed building footprint down to the surface of the glacial till deposit. In areas where the existing fill extends deeper than the proposed bottom of footing elevation, compacted structural fill should be placed from the surface of the glacial till deposit to the proposed bottom of footing elevation and to the subgrade of the proposed slabs.

Where proposed footings are to be supported on structural fill, the lateral limits of the excavation should extend beyond the outside edge of the footings for a horizontal distance equal to the depth from the bottom of the proposed footing to the surface of the natural, undisturbed glacial till deposit, plus two (2) feet in all plan directions.

Structural fill should consist of dry, suitable portions of the excavated on-site fill or glacial till containing less than 25 percent passing the No. 200 sieve or an off-site well-graded, natural sand and gravel (i.e. gravel borrow) containing less than eight (8) percent passing the No. 200 sieve. Reuse of the on-site soil as structural fill will require special measures to maximize their reuse as discussed in more detail in the "Foundation Construction Considerations" section of this letter.

All structural fill and gravel borrow placed within the footprint of the proposed building for support of the footings and slabs-on-grade should be placed in lifts having a compacted thickness of six (6) inches and be compacted to a minimum of 95 percent of its maximum modified Proctor dry density. The placement and compaction of structural fill and gravel borrow should be monitored by a registered professional engineer or his designated representative in accordance with the provisions of the Code.

As an alternative to placement of structural fill, proposed footings may be supported on lean concrete placed on the surface of the natural glacial till deposit. The limits of the excavation for lean concrete placement should extend beyond the outside edge of the footing for a minimum horizontal distance of 6 inches. The excavation required for the placement of lean concrete is anticipated to be performed within a trench box which should minimize the size of the overexcavation and, hence, will generate less displaced soil in comparison with the excavation required for the placement of structural fill. In addition, as groundwater will likely be encountered above the surface of the glacial till and/or bedrock deposits, the use of lean concrete would require less dewatering. Lean concrete placed for support of the spread footings should have a minimum 28-day design compressive strength of 1,000 pounds per square-inch.

The proposed lowest level floor slabs should be designed as conventional slabs-on-grades underlain by a 6-inch minimum thickness of 3/4-inch crushed stone underlain by a thickness of filter fabric placed over the structural fill or glacial till subgrade. If lean concrete is utilized below the proposed footings, and the existing fill material has not been removed below the

proposed slab, it is recommended that the existing fill subgrade be proof compacted. Prior to placing the crushed stone, the exposed existing fill subgrade should be proof compacted with a minimum of four (4) passes of a double-drum vibratory roller. All soft and/or compressible areas identified by the proof compaction should be removed and replaced with compacted structural fill. Some cosmetic cracking of the slab may occur with time due to the presence of the existing fill which will remain below the slab.

It is currently understood that no occupied below-grade space is planned to be constructed as part of the proposed structures. As such, it is not anticipated that a foundation drainage system will be required for the proposed structures. All pits and localized depressions in the lowest-level slabs (i.e. elevator pits, etc.) should be provided with cementitious waterproofing to protect against groundwater intrusion.

Below-grade foundation walls receiving lateral support at the top and bottom (i.e. restrained walls) should be designed for a lateral earth pressure corresponding to an equivalent fluid density of 60 pounds per cubic-foot (pcf). Similarly, drained cantilevered retaining walls, (i.e. receiving no lateral support at the top) should be designed for a lateral earth pressure corresponding to an equivalent fluid density of 40 pcf. To these values must be added the pressures attributable to earthquake forces per Section 1610.2 of the Code.

Lateral forces can be considered to be transmitted from the structures to the soil by passive pressure against the foundation walls utilizing an equivalent fluid density of 120 pcf providing that the walls are designed to resist these pressures. Lateral force can also be considered to be transmitted from the structures to the soil by friction on the base of footings using a coefficient of 0.4, to which a safety factor of 1.5 should be applied.

Geotechnical Construction Considerations

The primary geotechnical construction considerations include the preparation of the bearing surfaces for the storage building and its slab-on-grade subgrade, preparation of the bearing surfaces for footings associated with site retaining walls, preparation of the proposed turf field subgrade, removal of existing foundation remains, re-use of excavated on-site soil, and off-site removal of excess excavated soil.

Preparation of the bearing surfaces for support of the spread footings and the slabs-on-grade should include the removal of all existing topsoil and fill material within the proposed building footprint to the surface of the glacial till deposit or bedrock and to the lateral limits defined herein for the placement of structural fill or lean concrete, as applicable. Further, the existing foundation remains which are present across the site should be removed in their entirety below footing locations, and within the limits of structural fill placed below footings.

To minimize disturbance to the glacial till deposit and structural fill bearing surfaces, all footing bearing surfaces consisting of soil should be excavated with a bucket which has

either a smooth, toothless cutting edge or a steel plate welded across the teeth. Further, it is recommended that as soon as the glacial till and structural fill bearing surfaces are exposed, they be immediately covered with a 3-inch thickness of 3/4-inch crushed stone to prevent disturbance of the subgrade during subsequent forming operations. If bearing surfaces consist of bedrock, or if lean concrete is placed for support of footings, this crushed stone layer may be omitted.

Preparation of the proposed turf field subgrade should include the removal of all topsoil within the limits of the proposed field. Following excavation of the topsoil, it is recommended that the existing fill subgrade be proof compacted. Prior to placing the turf field subgrade, which is anticipated to consist of a thickness of stone containing perforated drain pipes, the exposed existing fill subgrade should be proof compacted with a minimum of four (4) passes of a double-drum vibratory roller. All soft and/or compressible areas identified by the proof compaction should be removed and replaced with compacted structural fill.

It is anticipated that portions of the excavated soils may be re-used on-site as ordinary fill and structural fill, provided they are maintained in a dry condition and can be properly compacted. Excavated fill and glacial till to be reused on-site as structural fill should typically contain less than 25% by weight passing the No. 200 sieve. Excavated soil with greater than 25% by weight passing the No. 200 sieve should be segregated and can be reused on-site as ordinary fill subject to the provisions contained herein. Additionally, based on the results of our subsurface exploration, cobbles and boulders are likely to be encountered in the glacial till deposit and there is brick, concrete and other building debris in the fill material. Thus, prior to reusing this soil, it will be necessary to cull out all material in excess of 4 inches in its largest dimension.

Grain size distributions of representative samples of the fill and glacial till material indicate that the fines content ranges from about 10 to 30 percent. It is emphasized that excavated material will become unsuitable for re-use if it becomes too wet. Therefore, it is recommended that stockpiles of excavated material intended for reuse be protected against increases in moisture content by securely covering the stockpiles at all times with 6-mil polyethylene for protection from precipitation and also as a dust mitigation measure. The placement and compaction of on-site material should be completed during relatively dry and non-freezing conditions. If, due to any of the above conditions, the excavated material is unsuitable for reuse, an off-site gravel borrow should be used.

It is further noted that increases in moisture content to the existing fill subgrade of the turf field may result in a weakened subgrade condition. As such, the installation of perforated drain pipes within a permeable subgrade layer below the field is considered a paramount consideration to mitigate oversaturation of the site soils and improve the long-term performance of the field.

Due to the presence of organic material (roots) in the existing topsoil, we do not recommend reusing these materials as structural fill beneath footings or the slabs-on-grade.

The on-site existing topsoil and may be reused as ordinary fill in landscaped areas, provided it is protected from wet and freezing environments and can be compacted to the recommended densities.

Should excess excavated soil generated from the proposed construction require off-site removal, current Department of Environmental Protection (DEP) policies and regulations for off-site reuse of excess excavated soil require environmental characterization of the excavated soil prior to its off-site reuse. McPhail could perform this as an additional service if requested.

We trust that this information is sufficient for your present requirements. Please contact us if you require further information regarding this matter.

Very truly yours,

McPHAIL ASSOCIATES, LLC

John A. Erikson, P.E.

Peter J. DeChaves, L.S.P.

N:\Working Documents\Jobs\7172 - Olmsted Soccer Field\7172 - Olmsted Sports Fields - Geotechnical Engineering Letter - 052821.docx

JAE/pjd

NORTH

APPROXIMATE LIMITS OF PROPOSED SITE IMPROVEMENT

APPROXIMATE LIMITS OF PROPOSED SPORT FIELD

APPROXIMATE LIMITS OF PROPOSED STORAGE BUILDING

TP-1A
TP-1B
TP-1
TP-2
TP-3
TP-4
TP-5
TP-6

AD 100(DOME)
RIM=46.00
INV=40.92

AB 203
RIM=47.90
INV OUT=45.20

AD 101(DOME)
RIM=46.00
INV=40.70

DMH 200
RIM=47.20
INV IN=40.58
INV OUT=40.47

AB 206
RIM=46.02
INV IN=42.70
INV OUT=42.60

12" CPP

MORTON STREET

LEGEND

⋈ — APPROXIMATE LOCATION OF TEST PIT PERFORMED BY LEDERMAN ENGINEERING, INC. ON MAY 4, 2021 FOR McPHAIL ASSOCIATES, LLC

REFERENCE: THIS PLAN WAS PREPARED FROM A 20-SCALE DRAWING ENTITLED "SITE UTILITY PLAN" DATED APRIL 8, 2021 BY NITSCH ENGINEERING, INC.

GRAPHIC SCALE
20 0 20 40 80

FILE NAME: W:\McPhail-fs2\McPhail\Acad\DBSV\7172\7172-F01-Site.dwg

McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)
www.mcphailgeo.com

OLMSTED GREEN SOCCER FIELD

BOSTON MASSACHUSETTS

SURFACE EXPLORATION PLAN

FOR

NEW BOSTON FUND

BY

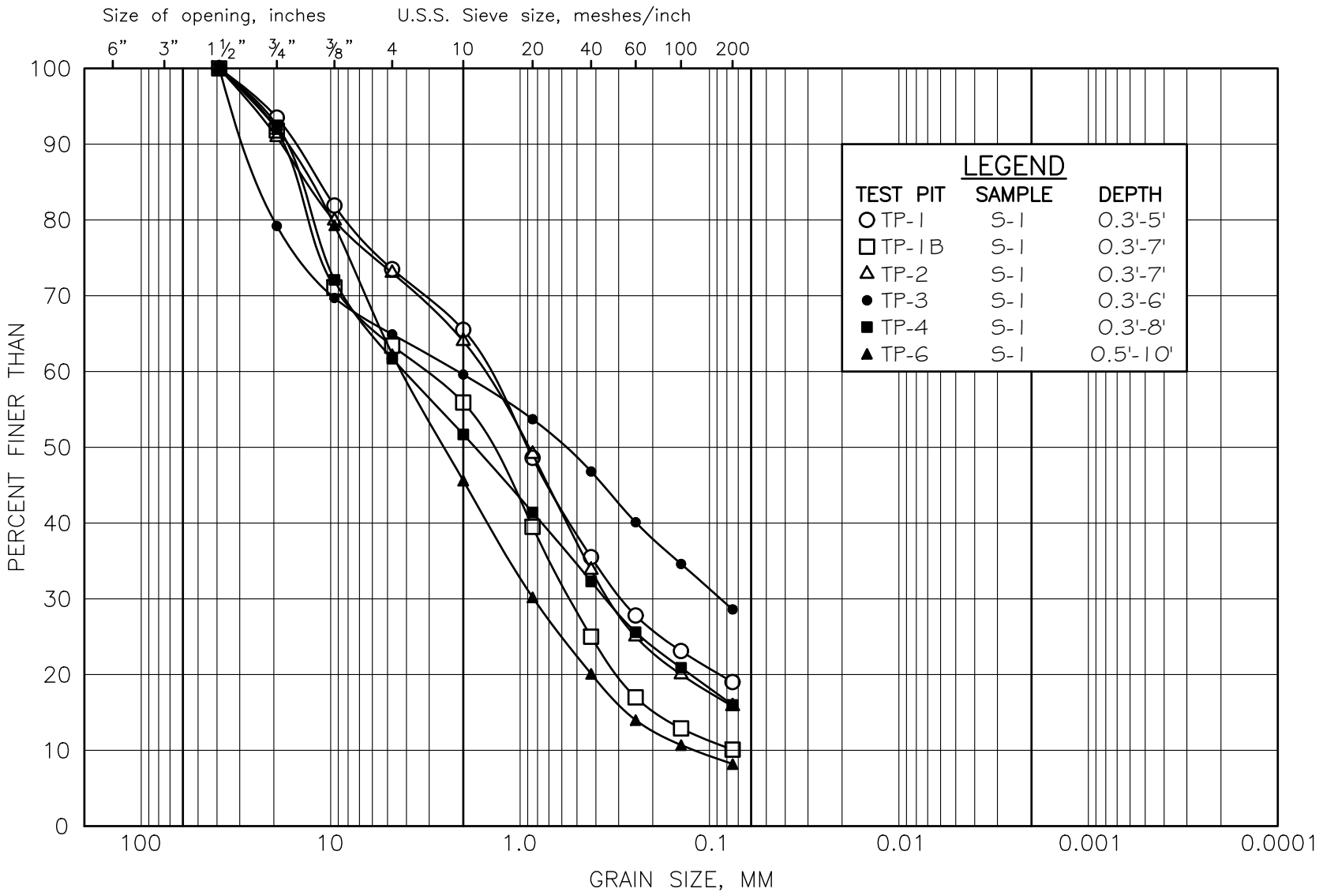
McPHAIL ASSOCIATES, LLC

Date: MAY 2021	Dwn: F.G.P.	Chkd: J.A.E.	Scale: 1" = 20'
Project No: 7172			FIGURE 1

FILE NAME: \\McPhail-fs2\McPhail\Acad\JOBS\7172\7172-F02_Sieve.dwg

PROJECT No. 7172

M.I.T. GRAIN SIZE SCALE



COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE			FINE GRAINED	

McPHAIL ASSOCIATES, LLC

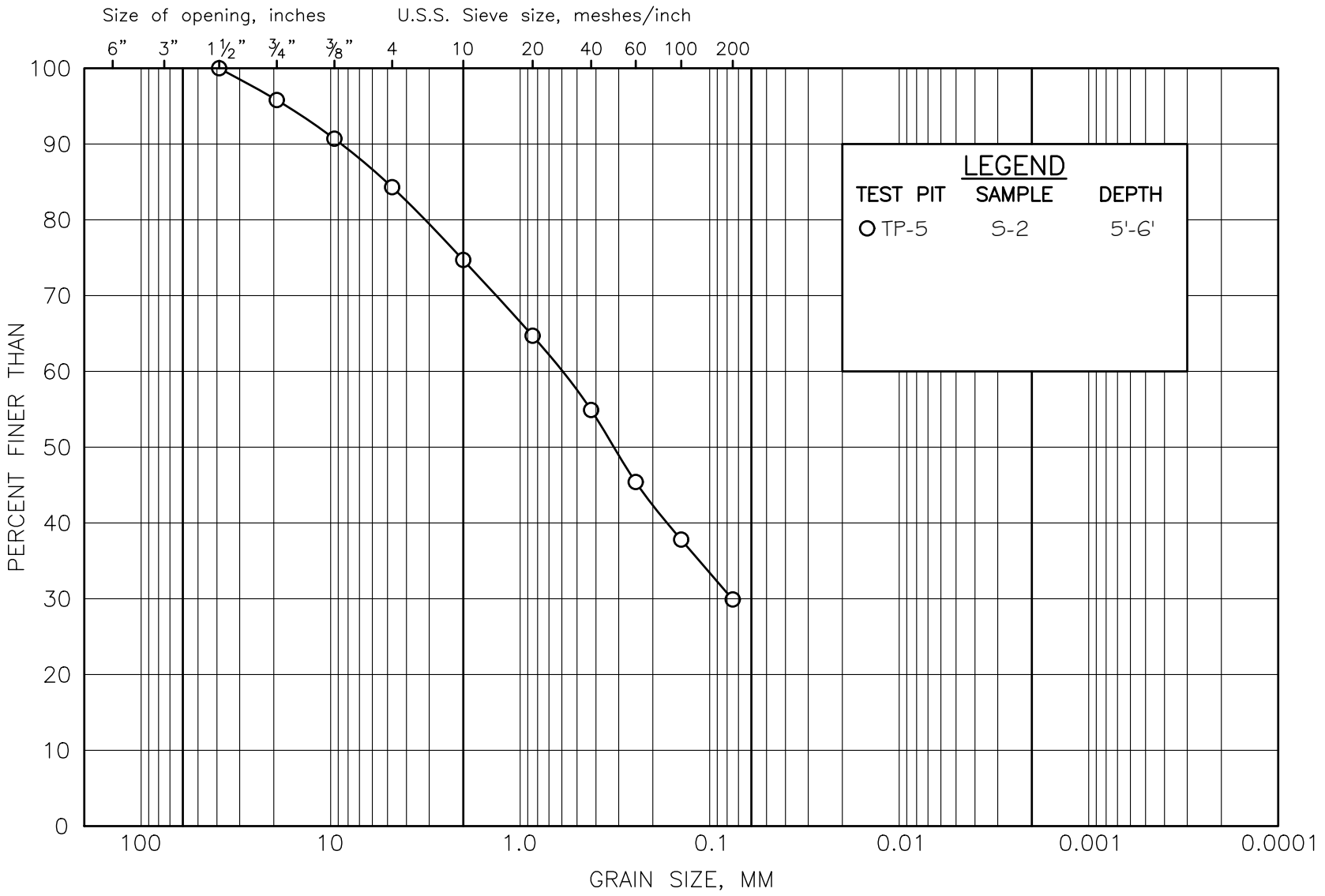
GRAIN SIZE DISTRIBUTION
FILL

FIGURE 2

FILE NAME: \\McPhail-fs2\McPhail\Acad\JOBS\7172\7172-F03_Sieve.dwg

PROJECT No. 7172

M.I.T. GRAIN SIZE SCALE



COBBLE SIZE	GRAVEL SIZE			SAND SIZE			FINE GRAINED	
	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE

McPHAIL ASSOCIATES, LLC

GRAIN SIZE DISTRIBUTION
GLACIAL TILL

FIGURE 3

APPENDIX A:

LIMITATIONS

LIMITATIONS

This letter has been prepared on behalf of and for the exclusive use of Lena New Boston, LLC for specific application to the proposed sports field to be located within the Olmsted Green Development in Boston, Massachusetts in accordance with generally accepted soil and geotechnical engineering practices. No other warranty, expressed or implied, is made.

In the event that any changes in nature or design of the proposed construction are planned, the conclusions and recommendations contained in this letter should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by McPhail Associates, LLC.

The analyses and recommendations presented in this letter are based upon the data obtained from the subsurface explorations performed at the approximate locations indicated on the enclosed plan. If variations in the nature and extent of subsurface conditions become evident during the course of construction, it will be necessary for a re-evaluation of the recommendations of this letter to be made after performing on-site observations during the construction period and noting the characteristics of any variations.

APPENDIX B:

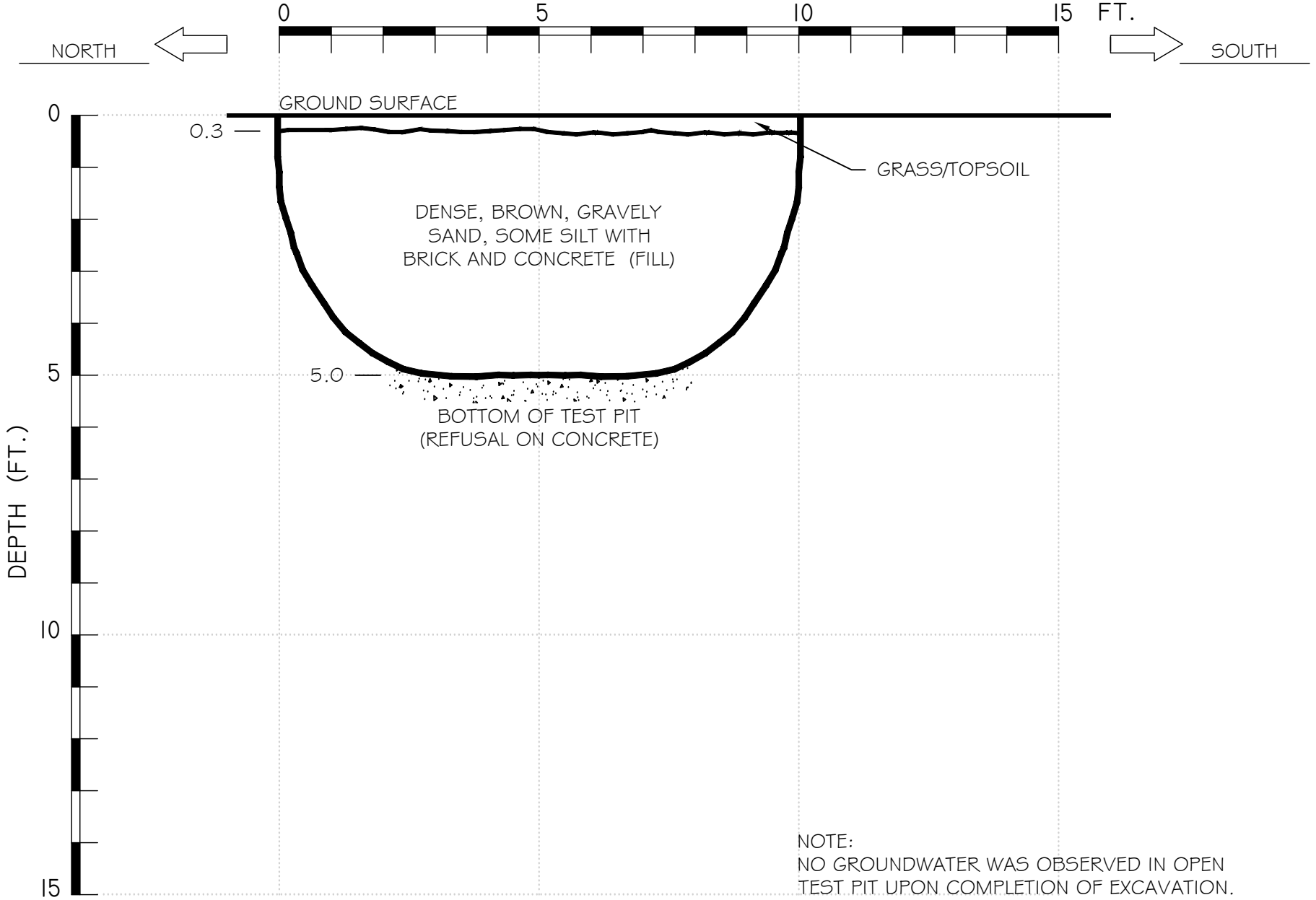
TEST PIT LOGS PREPARED BY MCPHAIL ASSOCIATES, LLC

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 1



NOTE:
NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION.

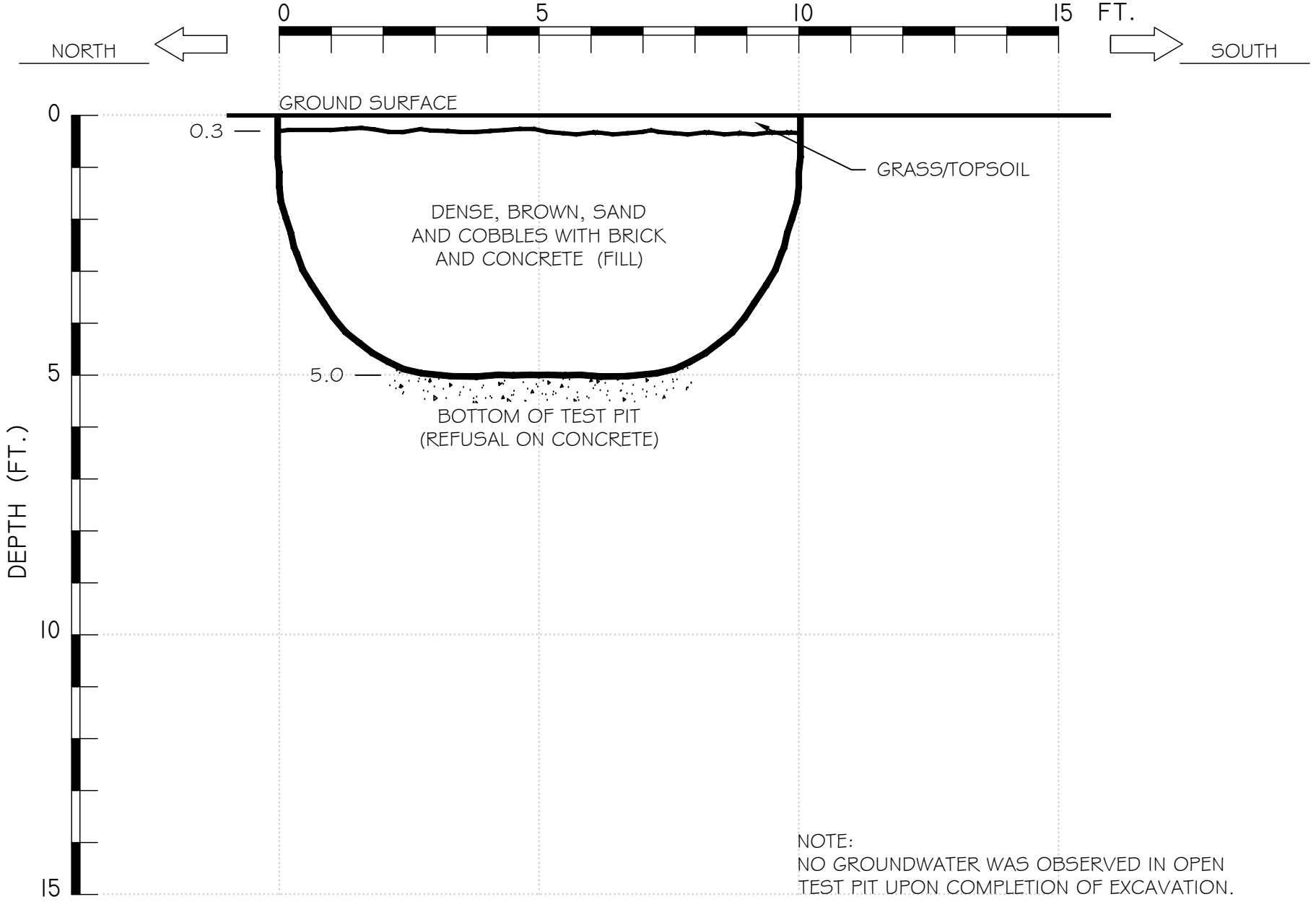
McPHAIL ASSOCIATES, LLC

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 1A



NOTE:
NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION.

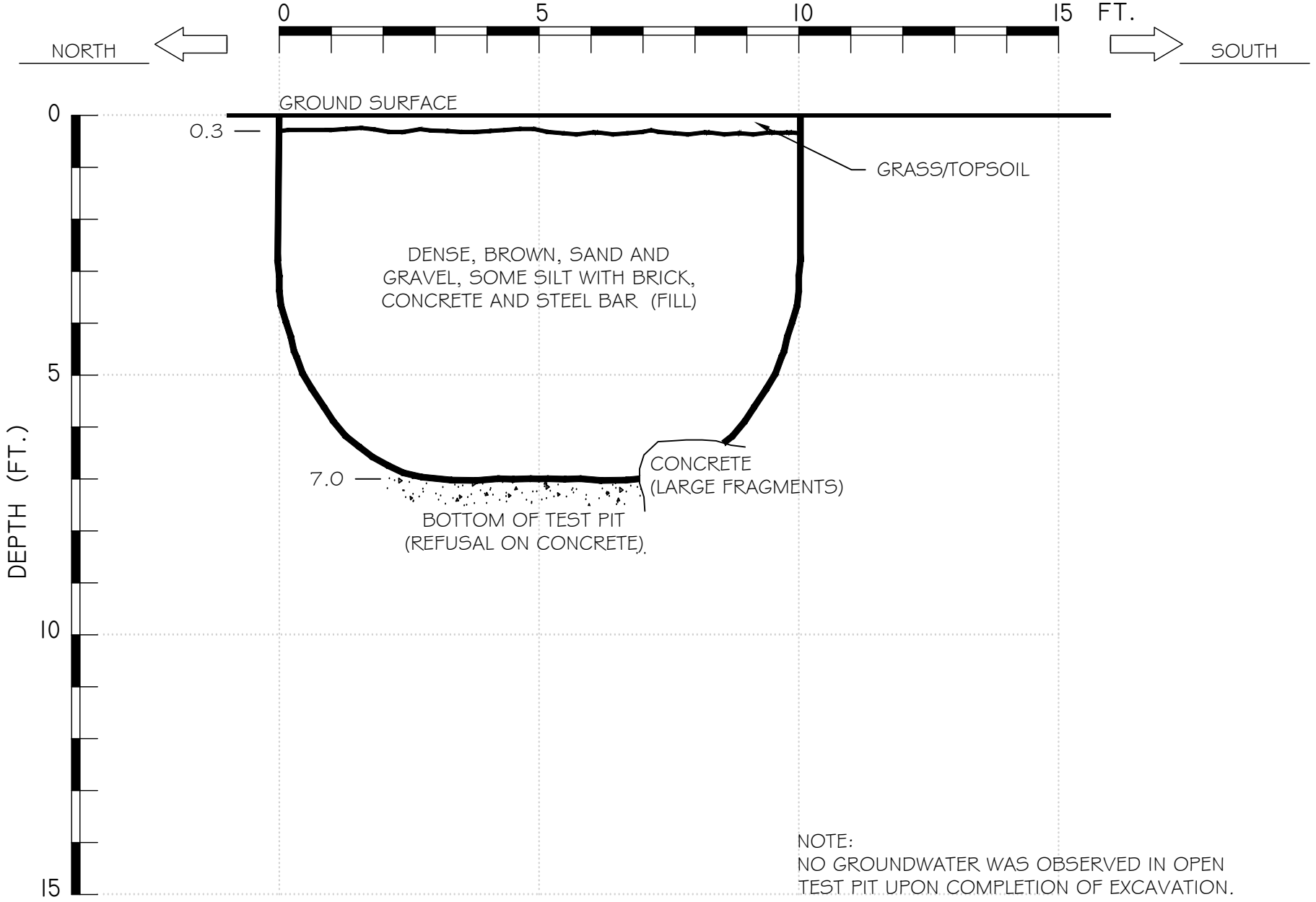
McPHAIL ASSOCIATES, LLC

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 1B



NOTE:
NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION.

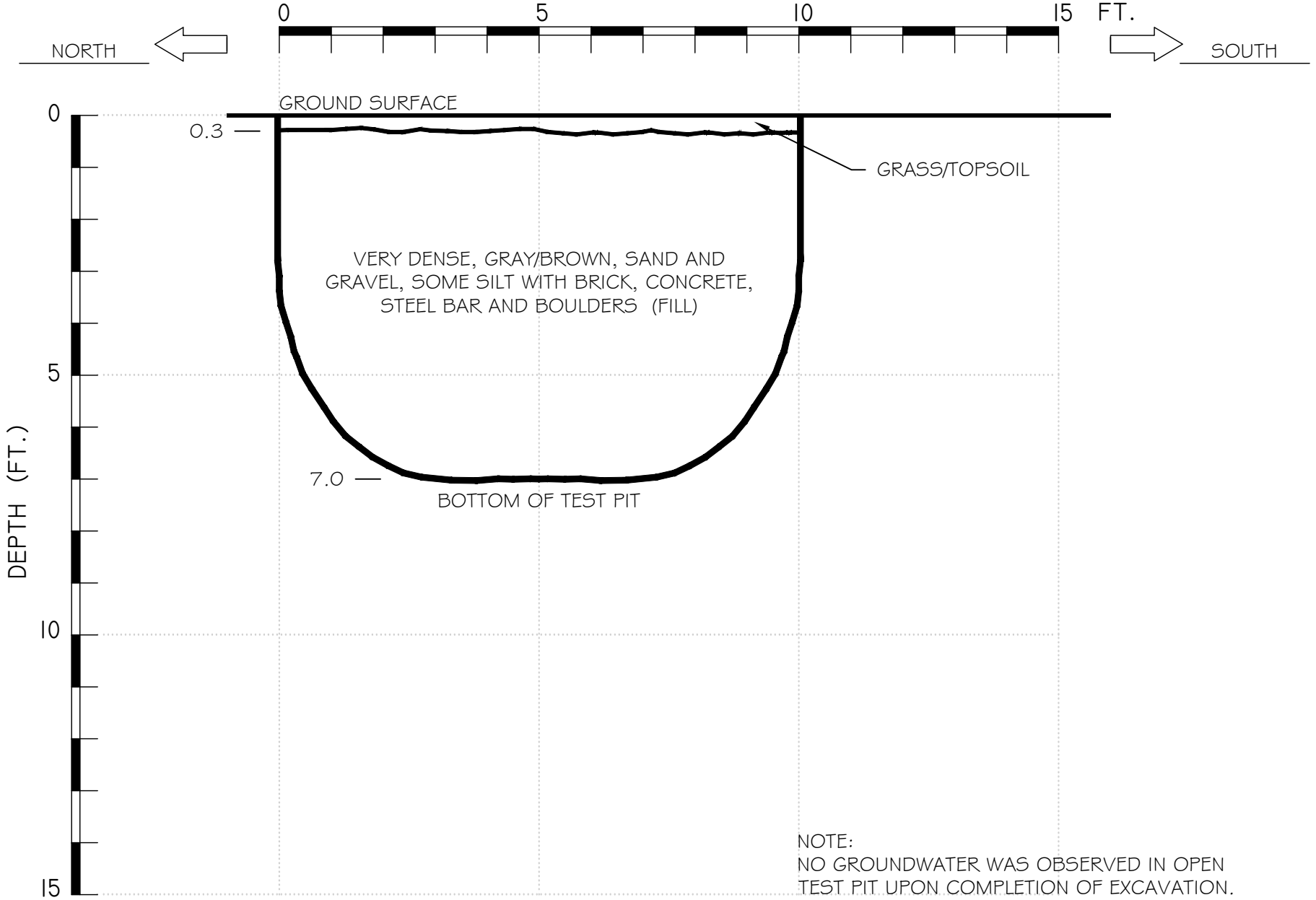
McPHAIL ASSOCIATES, LLC

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 2



NOTE:
NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION.

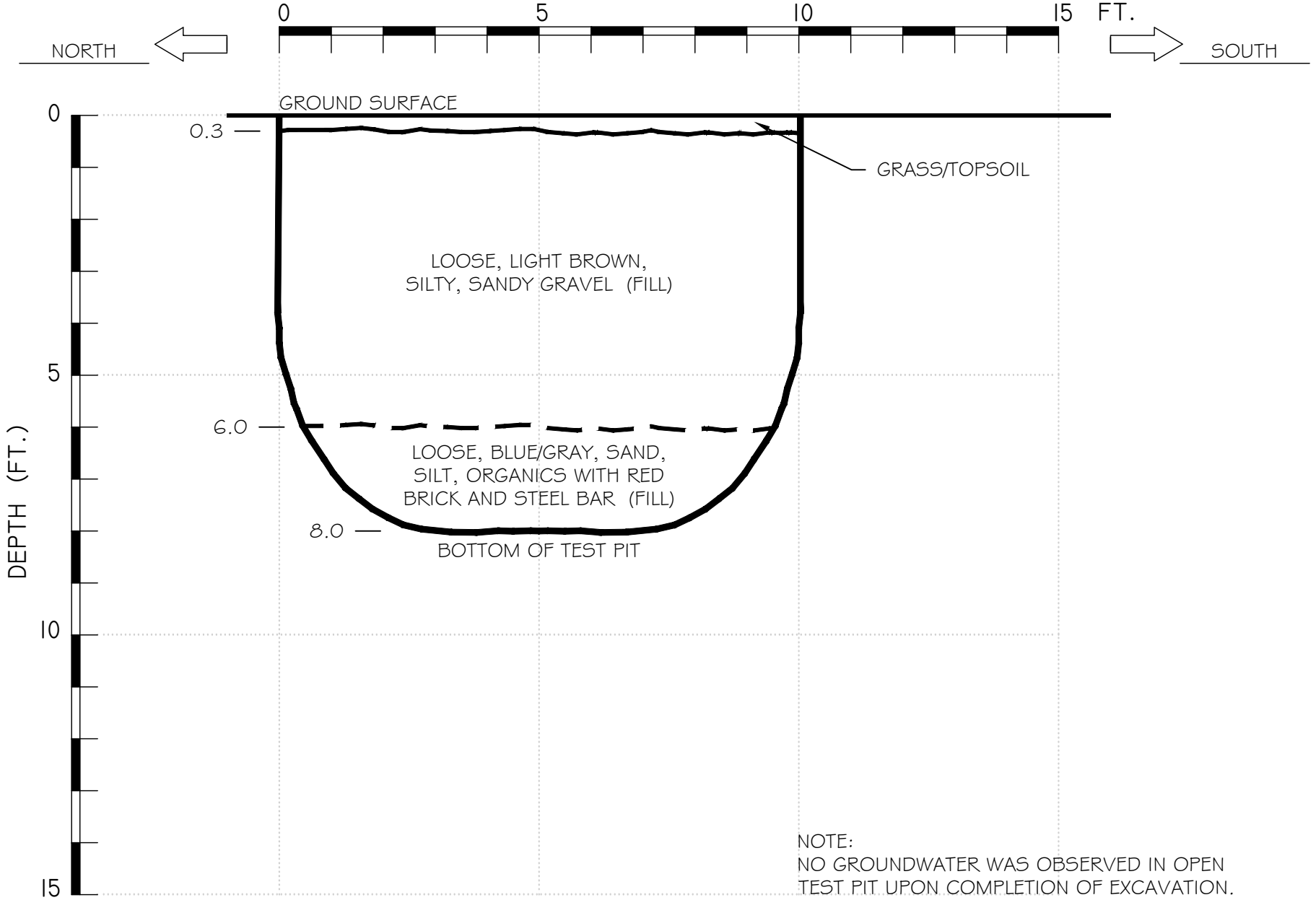
McPHAIL ASSOCIATES, LLC

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 3



McPHAIL ASSOCIATES, LLC

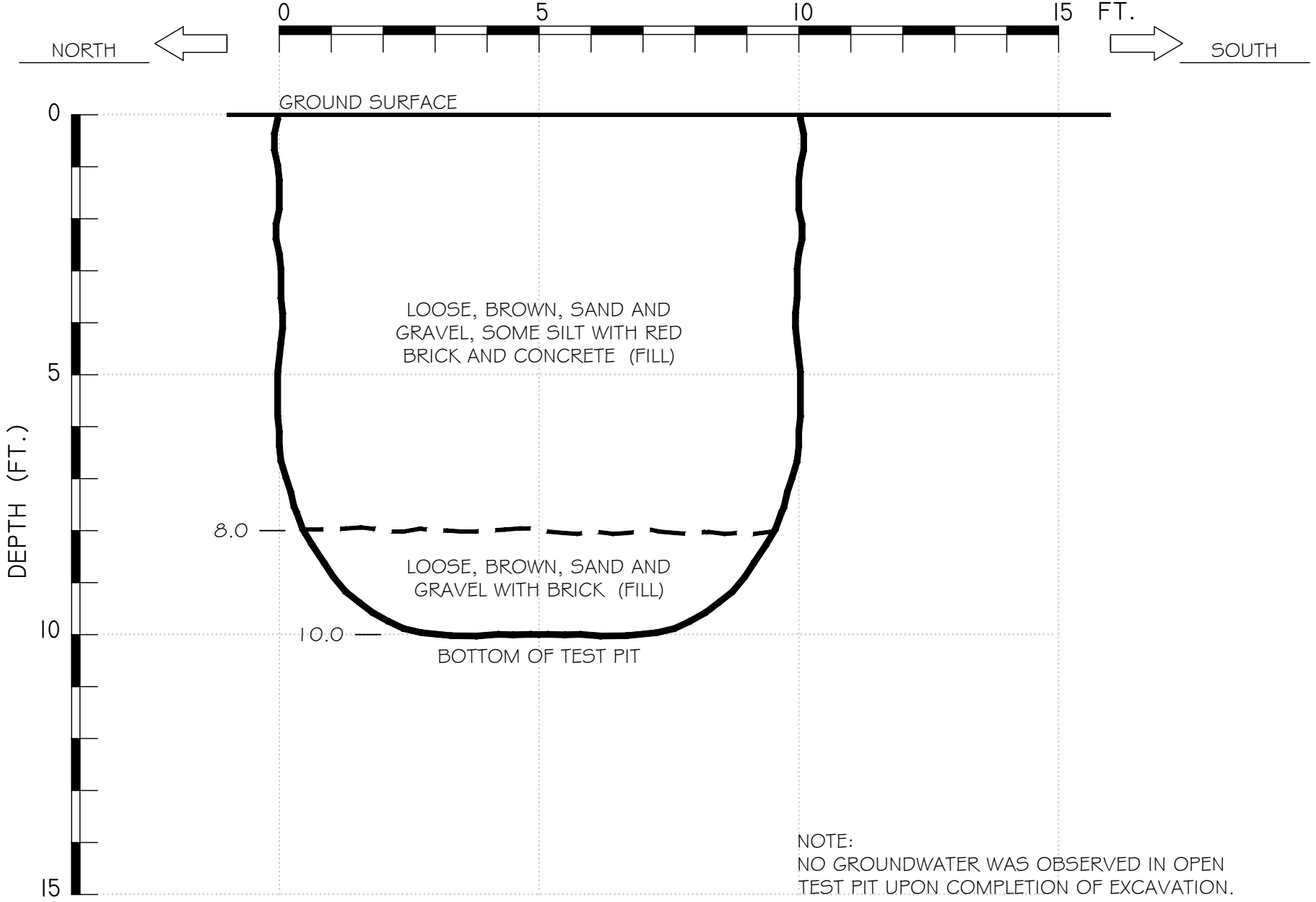
NOTE:
NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION.

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 4



NOTE:
NO GROUNDWATER WAS OBSERVED IN OPEN TEST PIT UPON COMPLETION OF EXCAVATION.

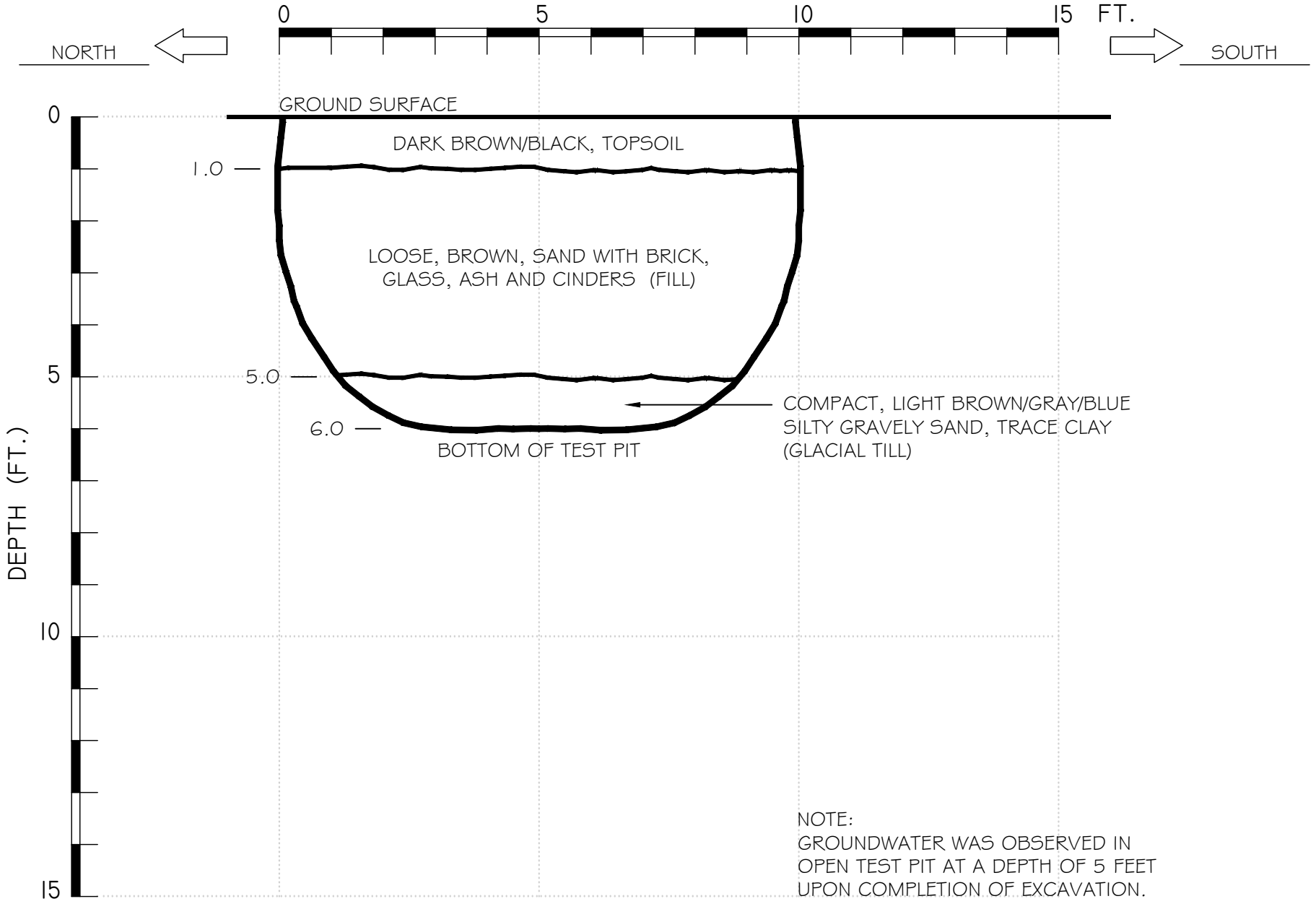
McPHAIL ASSOCIATES, LLC

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 5



NOTE:
GROUNDWATER WAS OBSERVED IN OPEN TEST PIT AT A DEPTH OF 5 FEET UPON COMPLETION OF EXCAVATION.

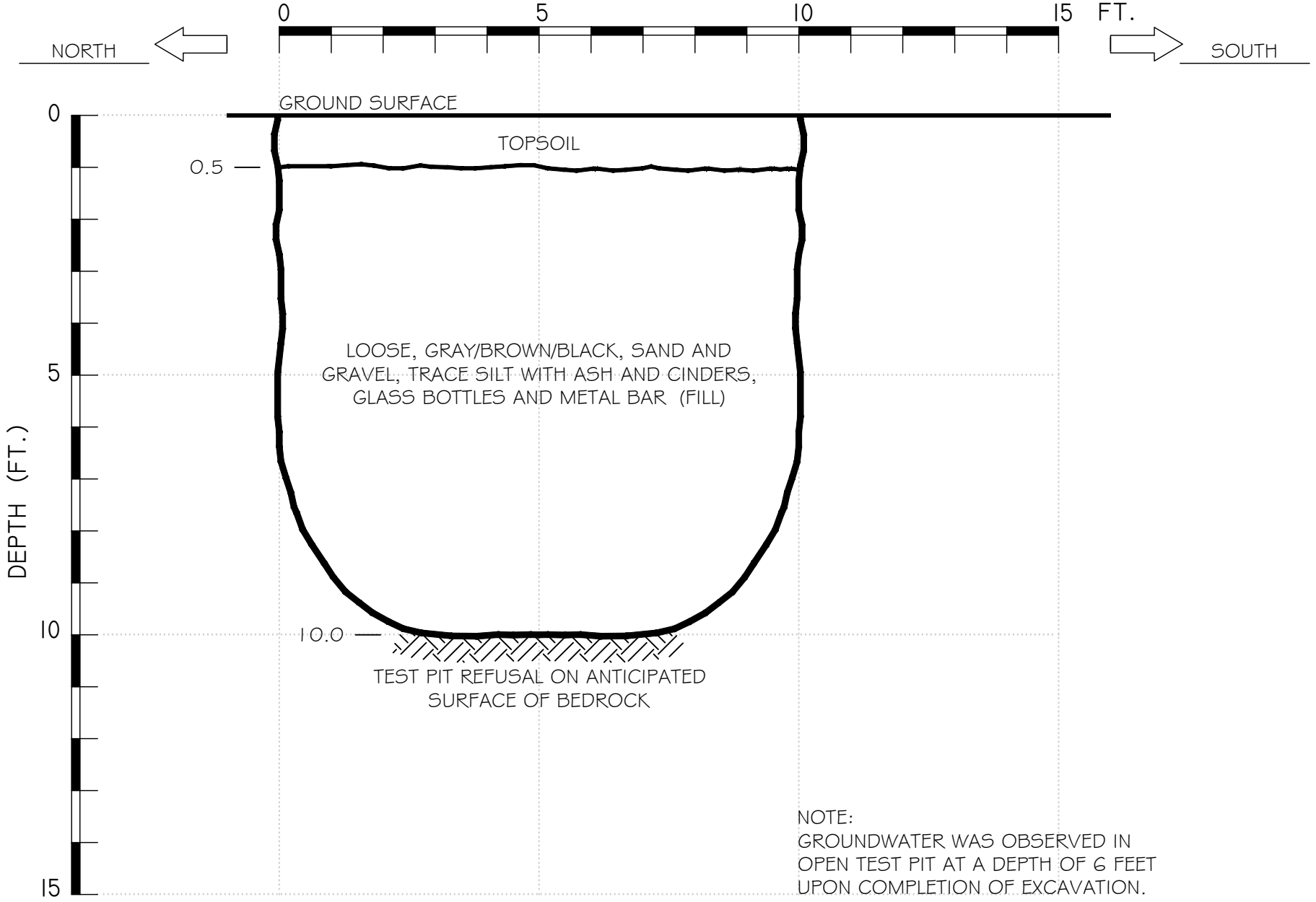
McPHAIL ASSOCIATES, LLC

JOB NO. 7172

DATE MAY 4, 2021

TEST PIT LOG

TEST PIT NO. 6



NOTE:
GROUNDWATER WAS OBSERVED IN OPEN TEST PIT AT A DEPTH OF 6 FEET UPON COMPLETION OF EXCAVATION.

McPHAIL ASSOCIATES, LLC

NORTH

APPROXIMATE LIMITS OF PROPOSED SITE IMPROVEMENT

APPROXIMATE LIMITS OF PROPOSED SPORT FIELD

APPROXIMATE LIMITS OF PROPOSED STORAGE BUILDING

TP-1A
TP-1B
TP-1
TP-2
TP-3
TP-4
TP-5
TP-6
B-1 (OW)
B-2 (OW)
B-3 (OW)
B-4 (OW)

MORTON STREET

LEGEND

— APPROXIMATE LOCATION OF TEST PIT PERFORMED BY LEDERMAN ENGINEERING, INC. ON MAY 4, 2021 FOR McPHAIL ASSOCIATES, LLC

— APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP. ON AUGUST 4 AND 5, 2021 FOR McPHAIL ASSOCIATES, LLC

(OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE

REFERENCE: THIS PLAN WAS PREPARED FROM A 20-SCALE DRAWING ENTITLED "SITE UTILITY PLAN" DATED APRIL 8, 2021 BY NITSCH ENGINEERING, INC.

GRAPHIC SCALE
20 0 20 40 80

McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)
www.mcphailgeo.com

OLMSTED GREEN SOCCER FIELD

BOSTON MASSACHUSETTS

SURFACE EXPLORATION PLAN

FOR

NEW BOSTON FUND

BY

McPHAIL ASSOCIATES, LLC

Date: AUGUST 2021	Dwn: F.G.P.	Chkd: J.A.E.	Scale: 1" = 20'
Project No: 7172			FIGURE 1

FILE NAME: W:\McPhail-fs2\McPhail\Acad\OBSY\7172\F01 Site Rev1.dwg

Project:	Olmstead Green	**Job #:**	7172.9.01
Location:	Osprey Way, Boston, MA	**Date Started:**	8-4-21
City/State:	Boston, MA	**Date Finished:**	8-4-21

Boring No.

B-1(OW)

Contractor: Carr-Dee Corp.
Driller/Helper: Joe/ Neil
Logged By/Reviewed By: L. Espindola
Surface Elevation (ft):

Casing Type/Depth (ft): 3.75" HSA + 2.25" HSA
Casing Hammer (lbs)/Drop (in): 300lb/24"
Sampler Size/Type: 2" Splitspoon
Sampler Hammer (lbs)/Drop (in): 140lb/30"

Groundwater Observations

Date	Depth	Elev.	Notes
8-4-21	17'		
8-6-21	17'		

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample TVOC (ppm)	N-Value / RQD	No.	Pen. /Rec. (in)	Depth (ft)	Blows/6" / Min/ft	Sample Description and Boring Notes
1			0.2 /	TOPSOIL	1.3	53	S1	24/12	0.0-2.0	31 42 11 12	Very dense, gray/brown, SAND and GRAVEL, some silt, w/ 6" of stone below topsoil. (Fill)
2											
3					2.2	19	S2	24/16	2.0-4.0	14 10 9 11	Compact, gray/brown to orange, SANDY SILT and GRAVEL, w/ wood. (Fill)
4											
5					4.1	18	S3	24/14	4.0-6.0	6 13 5 5	Compact, gray/brown to orange, GRAVELLY SAND and SILT. (Fill)
6											
7					1.9	11	S4	24/16	6.0-8.0	6 6 5 4	Compact, gray/brown, SAND, SILT and GRAVEL, w/ wood. (Fill)
8											
9					1.9	6	S5	24/13	8.0-10.0	4 3 3 4	Loose, gray/brown, SAND and SILT to SANDY SILT and GRAVEL. (Fill)
10				FILL							
11					3.3	4	S6	24/16	10.0-12.0	1 2 2 2	Very loose to loose, blue/gray, SANDY SILT, some gravel, w/ organic fibers, brick and wood. (Fill)
12											
13					1.3	4	S7	24/12	12.0-14.0	1 2 2 3	Very loose to loose, blue/gray, SANDY SILT, some gravel, w/ organic fibers, brick and wood (Fill)
14											
15					2.0	116	S8	24/20	14.0-16.0	8 72 44 31	Very dense, gray to black, SAND, some silt w/ asphalt and ash & cinders. (Fill)
16											
17					0.8	39	S9	24/20	16.0-18.0	21 19 20 18	Dense, black, GRAVELLY SAND, some silt w/ brick, ash & cinders and asphalt. (Fill)
18											
19					1.9	16	S10	24/15	18.0-20.0	19 11 5 6	Compact, blue/gray to black, SAND and SILT, some gravel w/ brick and ash & cinders. (Fill)
20			20.0 /								
21					2.8	16	S11	24/22	20.0-22.0	4 7 9 9	Compact, blue/gray to orange, mottled, SANDY SILT, some gravel. (Alluvium)
22				ALLUVIUM							
23					2.0	114/10"	S12	16/8	22.0-23.3	5 14 100/4"	Compact, blue/gray to orange, mottled, SANDY SILT, some gravel. (Alluvium)

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
Observation well installed to 25' below ground surface, w/ 10 feet of screen.

Total Volatile Organic Compounds (TVOC) measured w/ PID Model:
TVOC Background: ppm
Weather: Overcast
Temperature:

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Olmstead Green	**Job #:**	7172.9.01
Location:	Osprey Way, Boston, MA	**Date Started:**	8-4-21
City/State:	Boston, MA	**Date Finished:**	8-4-21

Boring No.

B-1(OW)

Contractor: Carr-Dee Corp.
Driller/Helper: Joe/ Neil
Logged By/Reviewed By: L. Espindola
Surface Elevation (ft):

Casing Type/Depth (ft): 3.75" HSA + 2.25" HSA
Casing Hammer (lbs)/Drop (in): 300lb/24"
Sampler Size/Type: 2" Splitspoon
Sampler Hammer (lbs)/Drop (in): 140lb/30"

Groundwater Observations

Date	Depth	Elev.	Notes
8-4-21	17'		
8-6-21	17'		

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample TVOC (ppm)	Sample N-Value / RQD	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows/6" / Min/ft	Sample Description and Boring Notes
25											
26				ALLUVIUM	2.3	10	S13	24/12	25.0-27.0	3 4 6 6	Loose to compact, blue/gray, mottled, SANDY SILT, some weathered and fractured gravel. (Alluvium)
27			27.0 /	Bottom or borehole 27 feet below ground surface.							
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
Observation well installed to 25' below ground surface, w/ 10 feet of screen.

Total Volatile Organic Compounds (TVOC) measured w/ PID Model:
TVOC Background: ppm
Weather: Overcast
Temperature:

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Olmstead Green	**Job #:**	7172.9.01
Location:	Osprey Way, Boston, MA	**Date Started:**	8-4-21
City/State:	Boston, MA	**Date Finished:**	8-4-21

Boring No.

B-2(OW)

Contractor: Carr-Dee Corp.
Driller/Helper: Joe/ Neil
Logged By/Reviewed By: L. Espindola
Surface Elevation (ft):

Casing Type/Depth (ft): 3.75" HSA
Casing Hammer (lbs)/Drop (in): 300lb/24"
Sampler Size/Type: 2" Splitspoon
Sampler Hammer (lbs)/Drop (in): 140lb/30"

Groundwater Observations

Date	Depth	Elev.	Notes
8-4-21	15'		
8-6-21	14.8'		

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample TVOC (ppm)	Sample N-Value / RQD	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows/6" / Min/ft	Sample Description and Boring Notes
1			0.2 /	TOPSOIL	1.1	18	S1	24/18	0.0-2.0	2 6 12 14	Compact, brown, SAND and GRAVEL, some silt, w/ brick and ash & cinders. (Fill)
2											
3					2.4	23	S2	24/16	2.0-4.0	6 10 13 9	Compact, brown, SILTY SAND and GRAVEL, w/ brick and ash & cinders. (Fill)
4											
5					3.2	36	S3	24/20	4.0-6.0	10 9 27 6	Dense, brown, SILTY SAND and GRAVEL, w/ brick and 8" wood log. (Fill)
6				FILL							
7					1.3	13	S4	24/8	6.0-8.0	8 7 6 5	Compact, brown, SILT, SAND and GRAVEL, w/ brick and wood. (Fill)
8											
9					2.3	5	S5	24/6	8.0-10.0	6 3 2 3	Loose, brown, SAND and GRAVEL, some silt, w/ brick. (Fill)
10						100/3"	S6	3/3	10.0-10.3	100/3"	Very Dense, white/gray, crushed cobble. (Fill)
11											Augered to 12' to bypass obstruction.
12			12.0 /								
13					1.9	25	S7	24/18	12.0-14.0	9 12 13 17	Compact, gray, GRAVELLY SAND, trace silt. (Glacial Outwash)
14				GLACIAL OUTWASH							
15					1.1	20	S8	24/14	14.0-16.0	5 8 12 22	Compact, gray, GRAVELLY SAND, trace silt. (Glacial Outwash)
16			16.0 /	Bottom or borehole 16 feet below ground surface.							
17											
18											
19											
20											
21											
22											

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
Observation well installed to 20' below ground surface, w/ 10 feet of screen.

Total Volatile Organic Compounds (TVOC) measured w/ PID Model:
TVOC Background: ppm
Weather: Overcast
Temperature:

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Olmstead Green	**Job #:**	7172.9.01
Location:	Osprey Way, Boston, MA	**Date Started:**	8-5-21
City/State:	Boston, MA	**Date Finished:**	8-5-21

Boring No.

B-3(OW)

Contractor: Carr-Dee Corp.
Driller/Helper: Joe/ Steve
Logged By/Reviewed By: L. Espindola
Surface Elevation (ft):

Casing Type/Depth (ft): 3.75" HSA
Casing Hammer (lbs)/Drop (in): 300lb/24"
Sampler Size/Type: 2" Splitspoon
Sampler Hammer (lbs)/Drop (in): 140lb/30"

Groundwater Observations

Date	Depth	Elev.	Notes
8-5-21	13'		

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample TVOC (ppm)	Sample N-Value / RQD	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows/6" / Min/ft	Sample Description and Boring Notes
1			0.2 /	TOPSOIL	0.3	10	S1	24/12	0.0-2.0	2 3 7 5	Compact, brown, SILTY SAND and GRAVEL, w/ brick. (Fill)
2											
3					0.9	19	S2	24/8	2.0-4.0	7 9 10 7	Compact, brown, SILTY SAND and GRAVEL, w/ brick and ash & cinders. (Fill)
4											
5				FILL	1.4	20	S3	24/12	4.0-6.0	7 15 5 4	Compact, brown, SAND, SILT and GRAVEL, w/ brick. (Fill)
6											
7					1.1	6	S4	24/18	6.0-8.0	4 3 3 6	Loose, brown, SAND, SILT and GRAVEL, w/ brick and glass. (Fill)
8											
9					0.5	16	S5	24/14	8.0-10.0	11 7 9 12	Compact, brown, SAND, SILT and GRAVEL, w/ glass. (Fill)
10			10.0 /								
11					0.6	36	S6	24/16	10.0-12.0	22 19 17 16	Dense, gray, GRAVELLY SAND, trace silt. (Glacial Outwash)
12				GLACIAL OUTWASH							
13					0.8	17	S7	24/20	12.0-14.0	11 9 8 9	Compact, gray, GRAVELLY SAND, trace silt. (Glacial Outwash)
14			14.0 /								
15				Bottom or borehole 14 feet below ground surface.							
16											
17											
18											
19											
20											
21											
22											

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
Observation well installed to 20' below ground surface, w/ 10 feet of screen.

Total Volatile Organic Compounds (TVOC) measured w/ PID Model:
TVOC Background: ppm
Weather: Rain
Temperature:

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

Project:	Olmstead Green	**Job #:**	7172.9.01
Location:	Osprey Way, Boston, MA	**Date Started:**	8-5-21
City/State:	Boston, MA	**Date Finished:**	8-5-21

Boring No.

B-4(OW)

Contractor: Carr-Dee Corp.
Driller/Helper: Joe/ Steve
Logged By/Reviewed By: L. Espindola
Surface Elevation (ft):

Casing Type/Depth (ft): 3.75" HSA
Casing Hammer (lbs)/Drop (in): 300lb/24"
Sampler Size/Type: 2" Splitspoon
Sampler Hammer (lbs)/Drop (in): 140lb/30"

Groundwater Observations			
Date	Depth	Elev.	Notes
8-5-21	12'		

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample TVOC (ppm)	Sample N-Value / RQD	Sample No.	Sample Pen./Rec. (in)	Sample Depth (ft)	Sample Blows/6" / Min/ft	Sample Description and Boring Notes
1			0.2 /	TOPSOIL	120	5	S1	24/14	0.0-2.0	3 3 2 2	Loose, brown, SAND, SILT and GRAVEL w/ brick, ash and cinders and wood. (Fill)
2											
3					3.1	15	S2	24/20	2.0-4.0	9 9 6 5	Compact, brown, SAND, SILT and GRAVEL w/ brick, ash & cinders and wood. (Fill)
4											
5				FILL	1.2	8	S3	24/6	4.0-6.0	6 4 4 3	Loose, brown, SAND, SILT and GRAVEL. (Fill)
6											
7					1.3	8	S4	24/18	6.0-8.0	2 5 3 3	Loose, brown, SANDY SILT and GRAVEL, w/ brick and ash & cinders. (Fill)
8											
9					1.6	3	S5	24/14	8.0-10.0	1 2 1 2	Very loose, brown, SAND, SILT and GRAVEL, w/ organic fibers, brick, ash & cinders and wood. (Fill)
10			10.0 /								
11					2.1	50	S6	24/14	10.0-12.0	25 24 26 26	Dense to very dense, gray, GRAVELLY SAND, trace silt. (Glacial Outwash)
12				GLACIAL OUTWASH							
13					1.6	26	S7	24/16	12.0-14.0	11 12 14 16	Compact, gray, GRAVELLY SAND, trace silt. (Glacial Outwash)
14			14.0 /								
15				Bottom or borehole 14 feet below ground surface.							
16											
17											
18											
19											
20											
21											
22											

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

SOIL COMPONENT

DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

Notes:
Observation well installed to 20' below ground surface, w/ 10 feet of screen.

Total Volatile Organic Compounds (TVOC) measured w/ PID Model:
TVOC Background: ppm
Weather: Rain
Temperature:

McPHAIL ASSOCIATES, LLC
2269 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140
TEL: 617-868-1420
FAX: 617-868-1423

SECTION 4

DOCUMENTATION OF ABUTTER NOTIFICATION

Abutter Notification
Affidavit of Service
Certified Abutters List

City of Boston Environment

CITY of BOSTON Conservation Commission

NOTIFICATION TO ABUTTERS
BOSTON CONSERVATION COMMISSION

In accordance with the Massachusetts Wetlands Protection Act, Massachusetts General Laws Chapter 131, Section 40, and the Boston Wetlands Ordinance, you are hereby notified as an abutter to a project filed with the Boston Conservation Commission.

A. Brooke Charter Schools has filed a Notice of Intent with the Boston Conservation Commission seeking permission to alter an Area Subject to Protection under the Wetlands Protection Act (General Laws Chapter 131, section 40) and/or the Boston Wetlands Ordinance.

B. The address of the lot where the activity is proposed is 550 Morton Street.

C. The project involves the construction of a new community field, walkway, restroom building, seating, storage area, and driveway.

D. Copies of the application may be obtained by contacting the Boston Conservation Commission at **CC@boston.gov**.

E. Copies of the application may be obtained from Boston Conservation Commission by contacting them at (617)635-3850 between the hours of 830am, 5om.

F. In accordance with the Chapter 107 of the Acts of 2022, the public hearing will take place **virtually** at https://zoom.us/j/6864582044. If you are unable to access the internet, you can call 1-929-205-6099, enter Meeting ID 686 458 2044 # and use # as your participant ID.

G. Information regarding the date and time of the public hearing may be obtained from the **Boston Conservation Commission** by emailing **CC@boston.gov** or calling **(617) 635-3850** between the hours of **9 AM to 5 PM, Monday through Friday.**

NOTE: Notice of the public hearing, including its date, time, and place, will be published at least five (5) days in advance in the **Boston Herald.**

NOTE: Notice of the public hearing, including its date, time, and place, will be posted on www.boston.gov/public-notices and in Boston City Hall not less than forty-eight (48) hours in advance. If you would like to provide comments, you may attend the public hearing or send written comments to CC@boston.gov or Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

NOTE: If you would like to provide comments, you may attend the public hearing or send written comments to CC@boston.gov or Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

NOTE: You also may contact the Boston Conservation Commission or the Department of Environmental Protection Northeast Regional Office for more information about this application or the Wetlands Protection Act. To contact DEP, call: the Northeast Region: (978) 694-3200.

NOTE: If you plan to attend the public hearing and are in need of interpretation, please notify staff at CC@boston.gov by 12 PM the day before the hearing.

BABEL NOTICE

English:

IMPORTANT! This document or application contains **important information** about your rights, responsibilities and/or benefits. It is crucial that you understand the information in this document and/or application, and we will provide the information in your preferred language at no cost to you. If you need them, please contact us at cc@boston.gov or 617-635-3850.

Spanish:

¡IMPORTANTE! Este documento o solicitud contiene **información importante** sobre sus derechos, responsabilidades y/o beneficios. Es fundamental que usted entienda la información contenida en este documento y/o solicitud, y le proporcionaremos la información en su idioma preferido sin costo alguno para usted. Si los necesita, póngase en contacto con nosotros en el correo electrónico cc@boston.gov o llamando al 617-635-3850.

Haitian Creole:

AVI ENPÒTAN! Dokiman oubyen aplikasyon sa genyen **enfòmasyon ki enpòtan** konsènan dwa, responsablite, ak/oswa benefis ou yo. Li enpòtan ke ou konprann enfòmasyon ki nan dokiman ak/oubyen aplikasyon sa, e n ap bay enfòmasyon an nan lang ou prefere a, san ou pa peye anyen. Si w bezwen yo, tanpri kontakte nou nan cc@boston.gov oswa 617-635-3850.

Traditional Chinese:

非常重要！這份文件或是申請表格包含關於您的權利，責任，和／或福利的重要信息。請您務必完全理解這份文件或申請表格的全部信息，這對我們來說十分重要。我們會免費給您提供翻譯服務。如果您有需要請聯系我們的郵箱 cc@boston.gov 電話# 617-635-3850..

Vietnamese:

QUAN TRỌNG! Tài liệu hoặc đơn yêu cầu này chứa **thông tin quan trọng** về các quyền, trách nhiệm và/hoặc lợi ích của bạn. Việc bạn hiểu rõ thông tin trong tài liệu và/hoặc đơn yêu cầu này rất quan trọng, và chúng tôi sẽ cung cấp thông tin bằng ngôn ngữ bạn muốn mà không tính phí. Nếu quý vị cần những dịch vụ này, vui lòng liên lạc với chúng tôi theo địa chỉ cc@boston.gov hoặc số điện thoại 617-635-3850.

Simplified Chinese:

非常重要！这份文件或是申请表格包含关于您的权利，责任，和／或福利的重要信息。请您务必完全理解这份文件或申请表格的全部信息，这对我们来说十分重要。我们会免费给您提供翻译服务。如果您有需要请联系我们的邮箱 cc@boston.gov 电话# 617-635-3850.

CITY of BOSTON

Cape Verdean Creole:

INPURTANTI! Es dukumentu ó aplikason ten **informason inpurtanti** sobri bu direitus, rasponsabilidadis i/ó benefísius. Ê krusial ki bu intendi informason na es dukumentu i/ó aplikason ó nu ta da informason na língua di bu preferênsia sen ninhun kustu pa bó. Si bu prisiza del, kontata-nu na cc@boston.gov ó 617-635-3850.

Arabic:

مهم! يحتوي هذا المستند أو التطبيق على معلومات مهمة حول حقوقك ومسؤولياتك أو فوائدك. من الأهمية أن تفهم المعلومات الواردة في هذا المستند أو التطبيق. سوف نقدم المعلومات بلغتك المفضلة دون أي تكلفة عليك. إذا كنت في حاجة إليها، يرجى الاتصال بنا على cc@boston.gov أو 617-635-3850.

Russian:

ВАЖНО! В этом документе или заявлении содержится **важная информация** о ваших правах, обязанностях и/или льготах. Для нас очень важно, чтобы вы понимали приведенную в этом документе и/или заявлении информацию, и мы готовы бесплатно предоставить вам информацию на предпочитаемом вами языке. Если Вам они нужны, просьба связаться с нами по адресу электронной почты cc@boston.gov, либо по телефону 617-635-3850.

Portuguese:

IMPORTANTE! Este documento ou aplicativo contém **Informações importantes** sobre os seus direitos, responsabilidades e/ou benefícios. É importante que você compreenda as informações contidas neste documento e/ou aplicativo, e nós iremos fornecer as informações em seu idioma de preferência sem nenhum custo para você. Se precisar deles, fale conosco: cc@boston.gov ou 617-635-3850.

French:

IMPORTANT ! Ce document ou cette demande contient des **informations importantes** concernant vos droits, responsabilités et/ou avantages. Il est essentiel que vous compreniez les informations contenues dans ce document et/ou cette demande, que nous pouvons vous communiquer gratuitement dans la langue de votre choix. Si vous en avez besoin, veuillez nous contacter à cc@boston.gov ou au 617-635-3850.

CITY of BOSTON

City of Boston
Environment

CITY of BOSTON
Conservation Commission

AVI POU PWOPRIYETÈ KI GEN PWOPRIYETE KOLE AK LÒT YO
BOSTON CONSERVATION COMMISSION (KOMISYON KONSÈVASYON BOSTON)

Annakò avèk Lwa sou Pwoteksyon Zòn Imid nan Massachusetts (Massachusetts Wetlands Protection Act), Lwa Jeneral Massachusetts (Massachusetts General Laws) Chapit 131, Seksyon 40, ak Òdinans sou Zòn Marekaj nan Boston (Boston Wetlands Ordinance), n ap avize w antanke yon pwopriyetè ki gen pwopriyete kole ak lòt yo e ki asosye ak yon pwojè ki anrejistre avèk Boston Conservation Commission (Komisyon Konsèvasyon Boston) an.

A. Brooke Charter Schools depoze yon aplikasyon avèk Komisyon Konsèvasyon Boston (Boston Conservation Commission) kote l ap mande pèmisyon pou modifye yon Zòn ki Ka Sijè a Pwoteksyon anba Lwa pou Pwoteksyon Zòn Marekaj (Wetlands Protection Act) (Lwa Jeneral Chapit 131, seksyon 40) ak Òdinans sou Zòn Imid nan Boston (Boston Wetlands Ordinance) yo.

B. Adrès sit kote aktivite y ap pwopoze a ye a se 550 Morton Street.

C. Pwojè a gen ladann konstwi yon nouvo tèren pou kominote a, pasrèl, twalèt, chèz, zòn depo, ak kote pou machin yo antre.

D. Ou ka jwenn kopi Avi Entansyon yo lè ou kontakte Komisyon Konsèvasyon nan Boston sou CC@boston.gov.

E. Ou ka jwenn kopi Avi Dentansyon an nan men Komisyon Konsèvasyon Boston nan (617)635-3850 ant 8:30 AM, 5:00 PM.

F. An akò avèk Chapit 107 nan Zak 2022 yo, odyans piblik la pral fèt vityèlman sou sit entènèt sa https://zoom.us/j/6864582044. Si ou pa gen aksè a entènèt, ou ka patisipe nan telefòn. Rele (929) 205-6099, antre nimewo reyinyon an: 686 458 2044 # epi itilize # kòm ID patisipan ou.

G. Ou ka jwenn enfòmasyon konsènan dat ak lè odyans piblik la nan **Boston Conservation Commission (Komisyon Konsèvasyon Boston)** lè w voye yon imèl nan **CC@boston.gov** oswa lè w rele nan **(617) 635-4416** ant **9 AM a 5 PM, Lendi jiska Vandredi.**

REMAKE: Y ap pibliye avi sou odyans piblik la, ansanm ak dat la, lè a ak ki kote l ap fèt, omwen senk (5) jou davans nan **Boston Herald**.

REMAKE: Y ap pibliye avi sou odyans piblik la, ansanm ak dat la, lè a ak ki kote l ap fèt, sou www.boston.gov/public-notices ak nan Meri Boston (Boston City Hall) pa mwens ke karantuit (48) èdtan davans. Si w ta renmen pataje kòmantè w yo, ou kapab patisipe nan odyans piblik la oswa voye kòmantè w yo alekri nan CC@boston.gov oswa nan Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

REMAKE: Ou kapab kontakte Boston Conservation Commission (Komisyon Konsèvasyon Boston) oswa Biwo Rejyonal Nòdès Depatman Pwoteksyon Anviwònman an pou plis enfòmasyon sou aplikasyon sa a oswa sou Lwa sou Pwoteksyon Zòn Imid yo (Wetlands Protection Act). Pou kontakte Depatman Pwoteksyon Anviwònman an (DEP), rele Rejyon Nòdès la nan: (978) 694-3200.

REMAKE: Si w gen lentansyon ale nan odyans piblik la e ou bezwen sèvis entèpretasyon, tanpri avize manm pèsonèl yo nan CC@boston.gov avan 12 PM (Midi) jou anvan odyans lan.

City of Boston
Environment

CITY of BOSTON
Conservation Commission

NOTIFICACIÓN PARA PROPIETARIOS Y/O VECINOS COLINDANTES
COMISIÓN DE CONSERVACIÓN DE BOSTON

De conformidad con la Ley de protección de los humedales de Massachusetts, el Capítulo 131, Sección 40 de las Leyes Generales de Massachusetts y la Ordenanza sobre los humedales de Boston, por la presente queda usted notificado como propietario o vecino colindante de un proyecto presentado ante la Comisión de Conservación de Boston.

A. Brooke Charter Schools ha presentado una solicitud a la Comisión de Conservación de Boston pidiendo permiso para modificar una zona sujeta a protección en virtud de la Ley de protección de los humedales (Leyes generales, capítulo 131, sección 40) y la Ordenanza sobre los humedales de Boston.

B. La dirección del lote donde se propone la actividad es 550 Morton Street.

C. El proyecto consiste en La construcción de un nuevo parque comunitario, una pasarela, un edificio de aseos, asientos, zona de almacenamiento y acceso de vehículos..

D. Se pueden obtener copias del Aviso de Intención comunicándose con la Comisión de Conservación de Boston en CC@boston.gov.

E. Las copias de la notificación de intención pueden obtenerse en Comisión de conservación de Boston a (617)635-3850 entre las 8:30 AM, 5:00 PM.

F. De acuerdo con el Capítulo 107 de las Actas de 2022, la audiencia pública se llevará a cabo virtualmente en https://zoom.us/j/6864582044. Si no puede acceder a Internet, puede llamar al 1-929-205-6099, ingresar ID de reunión 686 458 2044 # y usar # como su ID de participante.

G. La información relativa a la fecha y hora de la audiencia pública puede solicitarse a la **Comisión de Conservación de Boston** por correo electrónico a **CC@boston.gov** o llamando al **(617) 635-4416** entre las **9 AM y las 5 PM, de lunes a viernes.**

NOTA: La notificación de la audiencia pública, incluida su fecha, hora y lugar, se publicará en el **Boston Herald** con al menos cinco (5) días de antelación.

NOTA: La notificación de la audiencia pública, incluida su fecha, hora y lugar, se publicará en www.boston.gov/public-notices y en el Ayuntamiento de Boston con no menos de cuarenta y ocho (48) horas de antelación. Si desea formular comentarios, puede asistir a la audiencia pública o enviarlos por escrito a CC@boston.gov o al Ayuntamiento de Boston, Departamento de Medio Ambiente, Sala 709, 1 City Hall Square, Boston, MA 02201.

NOTA: También puede comunicarse con la Comisión de Conservación de Boston o con la Oficina Regional del Noreste del Departamento de Protección Ambiental para obtener más información sobre esta solicitud o la Ley de Protección de Humedales. Para comunicarse con el DEP, llame a la Región Noreste: (978) 694-3200.

NOTA: si tiene previsto asistir a la audiencia pública y necesita servicios de interpretación, sírvase informar al personal en CC@boston.gov antes de las 12 PM del día anterior a la audiencia.

City of Boston
Environment

CITY of BOSTON
Conservation Commission

AFFIDAVIT OF SERVICE
FOR ABUTTER NOTIFICATION

Under the Massachusetts Wetlands Protection Act
and Boston Wetlands Ordinance

I, John Schmid, hereby certify under pains and penalties of perjury that that at least one week prior to the public hearing, I gave notice to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, section 40, and the DEP Guide to Abutter Notification dated April 8, 1994, in connection with the following matter:

A Notice of Intent was filed under the Massachusetts Wetlands Protection Act and/or the Boston Wetlands Ordinance by Brooke Charter Schools for the construction of a new community field, walkway, restroom building, seating, storage area, and driveway. located at 550 Morton Street, Boston, MA 02131.

The Abutter Notification For, the list of abutters to whom it was given, and their addresses are attached to this Affidavit of Service.

John Schmid
Name

02/09/2023
Date

OWNER	MAIL_ADDRESSEE	MAIL_ADDRESS	MAIL_CS MAIL_ZIPCODE		Property_Address
ABDAL-KHALLAQ NAIMA		26 SENATOR BOLLINGS CI	DORCHESTER, MA, 02124		26 SENATOR BOLLING CI Boston MA 02124
ARVAY LIANA LOUISE		7 LARK DR, Unit 202	MATTAPAN, MA, 02126		7 LARK DR 202 Boston MA 02126
BOSTON ASSETS & CURRENCY CP		800 BOYLSTON ST 16TH FLR	BOSTON, MA, 02199		5 LARK DR 203 Boston MA 02126
BOSTON POLICE POST 1018 VFW	C/O AMERICAN TOWER	PO BOX 723597	ATLANTA, GA, 31139		300 CANTERBURY ST Boston MA 02131
BOSTON POLICE POST 1018 VFW	C/O B.P.D POST 1018 VFW	300 CANTERBURY ST	ROSLINDALE, MA, 02131		300 CANTERBURY ST Boston MA 02131
CAINE ALPHEUS		9 LARK DR #201	MATTAPAN, MA, 02126		9 LARK DR 201 Boston MA 02126
CAMERON VINCE LEAU-SEAN		27 SNOWDEN WY	DORCHESTER, MA, 02124		27 SNOWDEN WY Boston MA 02124
CHEN TING		19 SNOWDEN WY	DORCHESTER, MA, 02124		19 SNOWDEN WY Boston MA 02124
COLETTI MARGARET		1 LARK DR #205	MATTAPAN, MA, 02126		1 LARK DR 205 Boston MA 02126
COMMONWEALTH OF MASS		450 WALK HILL ST	DORCHESTER, MA, 02124		HARVARD ST Boston MA 02124
COMMWLTH OF MASSACHUSETTS		430 CANTERBURY ST	ROSLINDALE, MA, 02131		430 CANTERBURY ST Boston MA 02131
CRUZ HARVARD LLC	C/O CRUZ DEVELOPMENT CORP	1 JOHN ELIOT SQ	ROXBURY, MA, 02119		27 SENATOR BOLLING CI Boston MA 02124, 31 SENATOR BOLLING CI Boston MA 02124, 35 SENATOR BOLLING CI Boston MA 02124, 39 SENATOR BOLLING CI Boston MA 02124, 40 SENATOR BOLLING CI Boston MA 02124 & 43 SENATOR BOLLING CI Boston MA 02124
CRUZ HARVARD LLC	C/O CRUZ DEVELOPMENT CORP	43 SENATOR BOLLING CIR	DORCHESTER, MA, 02124		43 SENATOR BOLLING CI Boston MA 02124
CRUZ JUSTIN B		17 SNOWDEN WAY	DORCHESTER, MA, 02124		17 SNOWDEN WY Boston MA 02124
CUNNINGHAM JACOBI I		6 WEST MAIN ST, Unit 208	MATTAPAN, MA, 02126		6 WEST MAIN ST 208 Boston MA 02126
FELTON FREDERIC L		14 BLUE JAY CI #302	MATTAPAN, MA, 02126		14 BLUE JAY CI 302 Boston MA 02126
FOUREAU ANNAISE		1 HUMMINGBIRD LANE #103	MATTAPAN, MA, 02126		1 HUMMINGBIRD LA 103 Boston MA 02126
FOUST BONNIE A		6 BLUE JAY CI #306	MATTAPAN, MA, 02126		6 BLUE JAY CI 306 Boston MA 02126
GREEN SHAWN		45 SENATOR BOLLING CIRCLE	DORCHESTER, MA, 02124		45 SENATOR BOLLING CI Boston MA 02124
HALBERT WILLIAM E		37 SENATOR BOLLING CIR	DORCHESTER, MA, 02124		37 SENATOR BOLLING CI Boston MA 02124
HARVARD COMMONS LP	C/O CRUZ DEVELOPMENT CORP	1 JOHN ELIOT SQ	ROXBURY, MA, 02119		465 469 HARVARD ST Boston MA 02124
HEARTH OLMSTEAD LP	C/O PEABODY PROPERTIES INC	536 GRANITE STREET	BRAINTREE, MA, 02184		2 KINGBIRD RD Boston MA 02124
HEYWARD FRANKIE D		4 WEST MAIN ST #207	MATTAPAN, MA, 02126		4 WEST MAIN ST 207 Boston MA 02126
HODGES ALLAN		25 SNOWDEN WY	DORCHESTER, MA, 02124		25 SNOWDEN WY Boston MA 02124
HUANG XUE MING		21 SNOWDEN WY	DORCHESTER, MA, 02124		21 SNOWDEN WY Boston MA 02124
JANICKI TIMOTHY		32 SENATOR BOLLING CIR	DORCHESTER, MA, 02124		32 SENATOR BOLLING CI Boston MA 02124
JUARBE ARTURO		2 BLUE JAY CI #209	MATTAPAN, MA, 02126		2 BLUE JAY CI 209 Boston MA 02126
KAECHLER CARMEN E		2 LARK DR #102	MATTAPAN, MA, 02126		2 LARK DR 102 Boston MA 02126
LABONTE MARGARET CLARE		2 WEST MAIN ST, Unit 206	MATTAPAN, MA, 02126		2 WEST MAIN ST 206 Boston MA 02126
LENA NEW BOSTON LLC	C/O WINN RESIDENTIAL	6 FANEUIL HALL MKT PL -5TH FL	BOSTON, MA, 02109		31 47 SANDPIPER LA Boston MA 02124
LENA NEW BOSTON LLC	C/O KELLY SHOM	75 STATE ST SUITE #1410	BOSTON, MA, 02109		MORTON ST Boston MA 02124
LENA NEW BOSTON LLC	126 JOHN ST SUITE 10	C/O WINN COMPANIES	LOWELL, MA, 01852		591 MORTON ST Boston MA 02124
LENORA CRUZ LIVING TRUST		23 SENATOR BOLLING CIR	DORCHESTER, MA, 02124		23 SENATOR BOLLING CI Boston MA 02124
LISA G WARD REVOCABLE TRUST	C/O LISA G WARD	8 BLUE JAY CI #305	MATTAPAN, MA, 02126		8 BLUE JAY CI 305 Boston MA 02126
LITTLE GABRIELE		4 BLUE JAY CI #307	MATTAPAN, MA, 02126		4 BLUE JAY CI 307 Boston MA 02126
LYONS JENNIFER		23 SNOWDEN WAY	DORCHESTER, MA, 02124		23 SNOWDEN WY Boston MA 02124
MARCOALDI DEREK		34 SENATOR BOLLING CI	DORCHESTER, MA, 02124		34 SENATOR BOLLING CI Boston MA 02124
MASS AUDUBON SOCIETY		208 SOUTH GREAT RD	LINCOLN, MA, 01773		AMERICAN LEGION HW Boston MA 02124

MASS AUDUBON SOCIETY		450 WALK HILL ST	DORCHESTER, MA, 02124		AMERICAN LEGION HW Boston MA 02124
MASS WATER RESOURCES AUTH		100 FIRST AV	CHARLESTOWN, MA, 02129		MORTON ST Boston MA 02124
MAUGHN-HILL PATRICIA		29 SENATOR BOLLING CIRCLE	DORCHESTER, MA, 02124		29 SENATOR BOLLING CI Boston MA 02124
MORTON DIAHANN		10 BLUE JAY CI #305	MATTAPAN, MA, 02126		10 BLUE JAY CI 304 Boston MA 02126
NURSE KHADEN		12 BLUE JAY CIR, Unit 303	MATTAPAN, MA, 02126		12 BLUE JAY CI 303 Boston MA 02126
OLMSTED GREEN CONDOMINIUM TRUST	C/O NEW BOSTON FUND	60 STATE ST STE 1500	BOSTON, MA, 02109		MORTON ST Boston MA 02126
OLMSTED GREEN RENTAL II LLC MASS LLC	C/O WINN RESIDENTIAL	6 FANEUIL HALL MARKET PL 5TH FL	BOSTON, MA, 02109		18 34 KINGBIRD RD Boston MA 02124
OLMSTED GREEN RENTAL III LLC	C/O WINN RESIDENTIAL	6 FANEUIL HALL MARKETPLACE	BOSTON, MA, 02109		2 76 OSPREY WY Boston MA 02124
RILEY GLORIA		4 LARK DRIVE #101	MATTAPAN, MA, 02126		4 LARK DR 101 Boston MA 02126
STEWART SABRIYA S		33 SENATOR BOLLING CI	DORCHESTER, MA, 02124		33 SENATOR BOLLING CI Boston MA 02124
VICHIER-GUERRE MARGUERITE THERESE		3 LARK DR, Unit 204	MATTAPAN, MA, 02126		3 LARK DR 204 Boston MA 02126
VON LICHTENBERG STEPHEN	C/O STEPHEN VON LICHTENBERG	16 BLUE JAY CI #301	MATTAPAN, MA, 02126		16 BLUE JAY CI 301 Boston MA 02126
WALLACE DERRON O		30 SENATOR BOLLING CIR	DORCHESTER, MA, 02124		30 SENATOR BOLLING CI Boston MA 02124
XIA DIWEI		28 SENATOR BOLLING ST	DORCHESTER, MA, 02124		28 SENATOR BOLLING CI Boston MA 02124

SECTION 5

SUPPLEMENTAL DOCUMENTS

Landscaping Tree Removal Plan
Landscaping Planting Schedule
Order of Resource Area Delineation

January 21, 2021

Christopher Hodney
Nitsch Engineering
2 Center Plaza – Suite 430
Boston, MA 02108

CERTIFIED MAIL: 7015 1520 0002 7630 1440

RE: Abbreviated Notice of Resource Area Delineation from Nitsch Engineering on behalf Lena New Boston LLC to confirm the limit and regulatory status of the wetland resource areas located at Morton St, Mattapan, MA

Dear Mr. Hodney,

Pursuant to the Massachusetts Wetlands Protection Act, G.L. c. 131, § 40 (the "Act") and the Boston Wetlands Ordinance, Boston City Code, Ordinances, Chapter 7-1.4 (the "Ordinance"), I have enclosed the Order of Resource Area Delineation for the above referenced project, as voted by the Conservation Commission at the January 6, 2021 public hearing. The delineated area was approved by the Commission as bordering vegetated wetland and isolated land subject to flooding as well as land under waterways, inland bank, riverfront area and waterfront area associated with Canterbury Brook, a perennial stream, with the delineations shown on the plans, as their boundaries.

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Conservation Commission and are binding as to all decisions rendered pursuant to the Act, its regulations (310 CMR 10.00), and the Ordinance.

If you should have any questions regarding the Order I may be contacted at 617-635-3850.

For the Commission,

Nicholas Moreno, Executive Director
Boston Conservation Commission

Enclosure: WPA Form 2

CC: DEP NERO

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username:	**SMACARI**
Transaction ID:	**1252168**
Document:	**WPA Form 4B - ORAD**
Size of File:	**87.30K**
Status of Transaction:	**In Process**
Date and Time Created:	**1/21/2021:11:12:36 AM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to "Download a Copy" from the Current Submittals page.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 4B - Order of Resource Area Delineation
Massachusetts Wetlands Protection Act M.G.L. c. 131 S40

Provided by MassDEP:
MassDEP File #:006-1755
eDEP Transaction #:1252168
City/Town:BOSTON

A. General Information

1. Conservation Commission BOSTON
2. This Issuance is for (Check one):
   a. ☑ Order of Resource Area Delineation
   b. ☐ Amended Order of Resource Area Delineation

3. Applicant Details

a. First Name	CHRISTOPHER	b. Last Name	HODNEY		
c. Organization	NITSCH ENGINEERING				
d. Mailing Address	2 CENTER PLAZA - SUITE 430				
e. City/Town	BOSTON	f. State	MA	g. ZIP	02108

4. Property Owner (if different from applicant):

a. First Name	ERIC	b. Last Name	VANDUSEN		
c. Organization	LENA NEW BOSTON, LLC				
d. Mailing Address	53 STATE STREET, SUITE 500				
e. City/Town	BOSTON	f. State	MA	g. ZIP	02109

5. Project Location

a. Street Address	MORTON STREET		
b. City/Town	BOSTON	c. Zip	02124
d. Assessors Map/Plat#	1405196970	e. Parcel/Lot#	PARCEL 2B-9
f. Latitude	42.29174N	g. Longitude	71.095354W

6. Dates

a. Date ANRAD Filed	9/8/2020	b. Date Public Hearing Closed	12/16/2020	c. Date Of Issuance	1/6/2021

7. Final Approved Plans and Other Documents

Plan Title	Plan Prepared By	Plan Signed By	Plan Final Date	Plan Scale
ANRAD PLAN	NITSCH ENGINEERING	CHRIS HODNEY	12/09/2020	1=30

B. Order of Delineation

1. The Conservation Commission has determined the following (check whichever is applicable)

a. ☑ **Accurate:** The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

1. ☑ Bordering Vegetated Wetlands
2. ☑ Other resource area(s), specifically
   a.ISOLATED LAND SUBJECT TO FLOODING, LAND UNDER WATER AND WATERWAYS, INLAND BANK, RIVERFRONT AREA, AND WATERFRONT AREA

b. ☐ **Modified:** The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn from the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically
   a.

c. ☐ **Inaccurate::** The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Recource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically
   a.
3. The boundaries were determined to be inaccurate because:

C. Findings

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, S 40) and its regulations (310 CMR 10.00). This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation. This Order must be signed by a majority of the Conservation Commission. The Order must be sent by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate DEP Regional Office (see http://www.mass.gov/dep/about/region/findyour.htm).

D. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate DEP Regional Office to issue a Superseding Order of Resource Area Delineation. When requested to issue a Superseding Order of Resource Area Delineation, the Department's review is limited to the objections to the resource area delineation(s) stated in the appeal request. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant. Any appellants seeking to appeal the Department?s Superseding Order of Resource Area Delineation will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order or Determination, or providing written information to the Department prior to issuance of a Superseding Order or Determination. The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act, (M.G.L. c. 131, S 40) and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
OOCe - 1755
MassDEP File Number
1252168
eDEP Transaction Number
Boston
City/Town
01/06/2021
Date of Issuance
6
1. Number of Signers

E. Signatures

Please indicate the number of members who will sign this form.

Signatures

DocuSigned by: Michael Parker — Signature of Conservation Commission Member	Printed Name Michael Parker
Aldo Ghirin — Signature of Conservation Commission Member	Printed Name Aldo Ghirin
Alice Richmond — Signature of Conservation Commission Member	Printed Name Alice Richmond
Anne Herbst — Signature of Conservation Commission Member	Printed Name Anne Herbst
Mike Wilson — Signature of Conservation Commission Member	Printed Name Mike Wilson
John Sullivan — Signature of Conservation Commission Member	Printed Name John Sullivan
Signature of Conservation Commission Member	Printed Name
Signature of Conservation Commission Member	Printed Name
Signature of Conservation Commission Member	Printed Name

This Order is valid for three years from the date of issuance.

If this Order constitutes an Amended Order of Resource Area Delineation, this Order does not extend the issuance date of the original Final Order, which expires on unless extended in writing by the issuing authority.

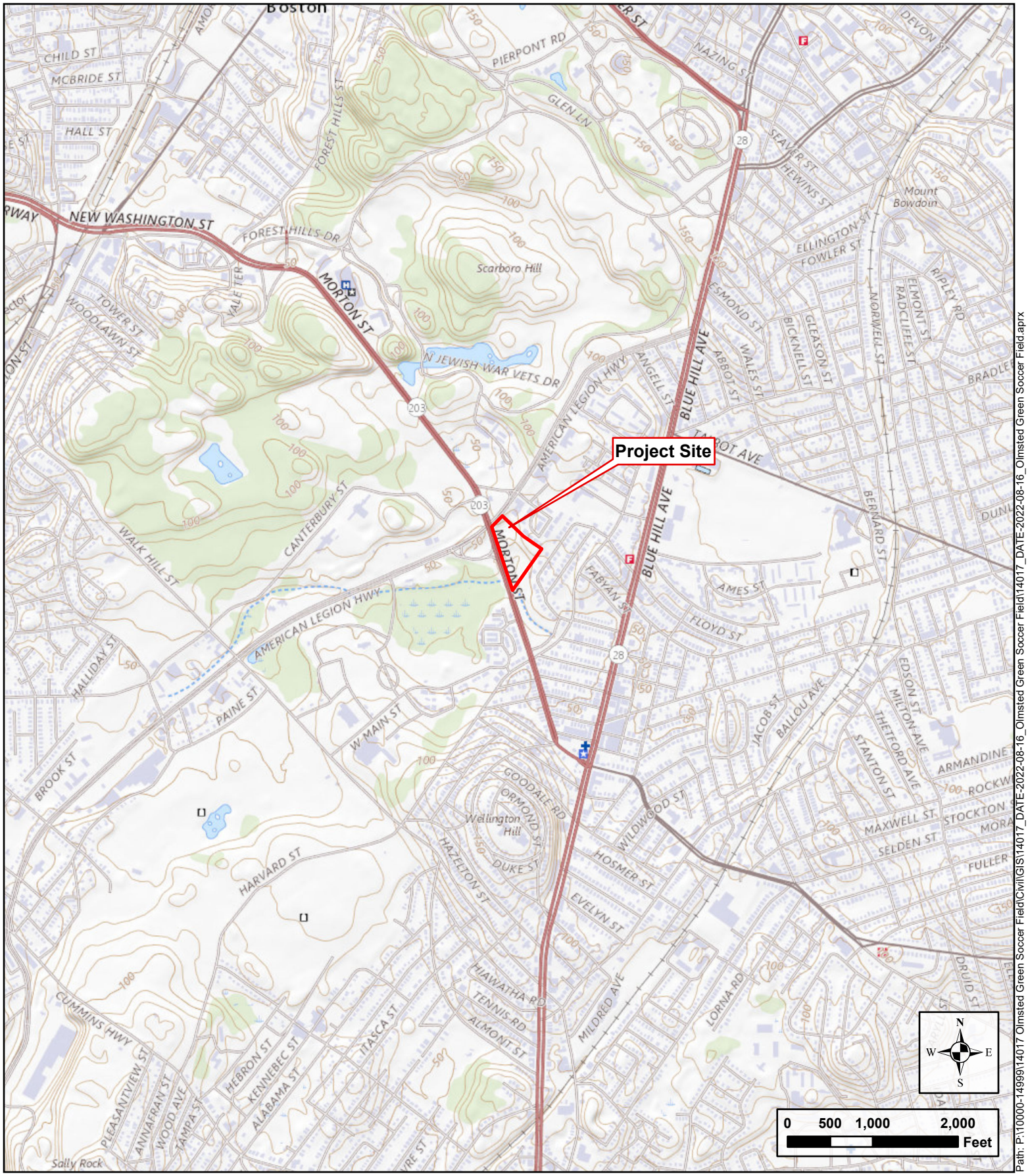
This Order is issued to the applicant and the property owner (if different) as follows:

2. ☐ By hand delivery on
a. Date

3. ☒ By certified mail, return receipt requested on
a. Date 01/21/2021

OLMSTED GREEN COMMUNITY FIELD – REPRESENTATIVE PHOTOS OF THE SITE

FIGURES



Path: P:\10000-14999\14017 Olmsted Green Soccer Field\Civil\GIS\14017_DATE-2022-08-16_Olmsted Green Soccer Field\14017_DATE-2022-08-16_Olmsted Green Soccer Field.aprx

Figure 1: USGS Locus

Olmsted Green Soccer Field
West Roxbury

8/16/2022

Data Source: USGS
Nitsch Project #14017

Nitsch Engineering

Path: P:\10000-14999\14017 Olmsted Green Soccer Field\Civil\GIS\14017_DATE-2022-08-16_Olmsted Green Soccer Field\14017_DATE-2022-08-16_Olmsted Green Soccer Field.aprx

Figure 2: Aerial Locus

Olmsted Green Soccer Field
West Roxbury

8/16/2022

Data Source: MassGIS
Nitsch Project #14017

Nitsch Engineering

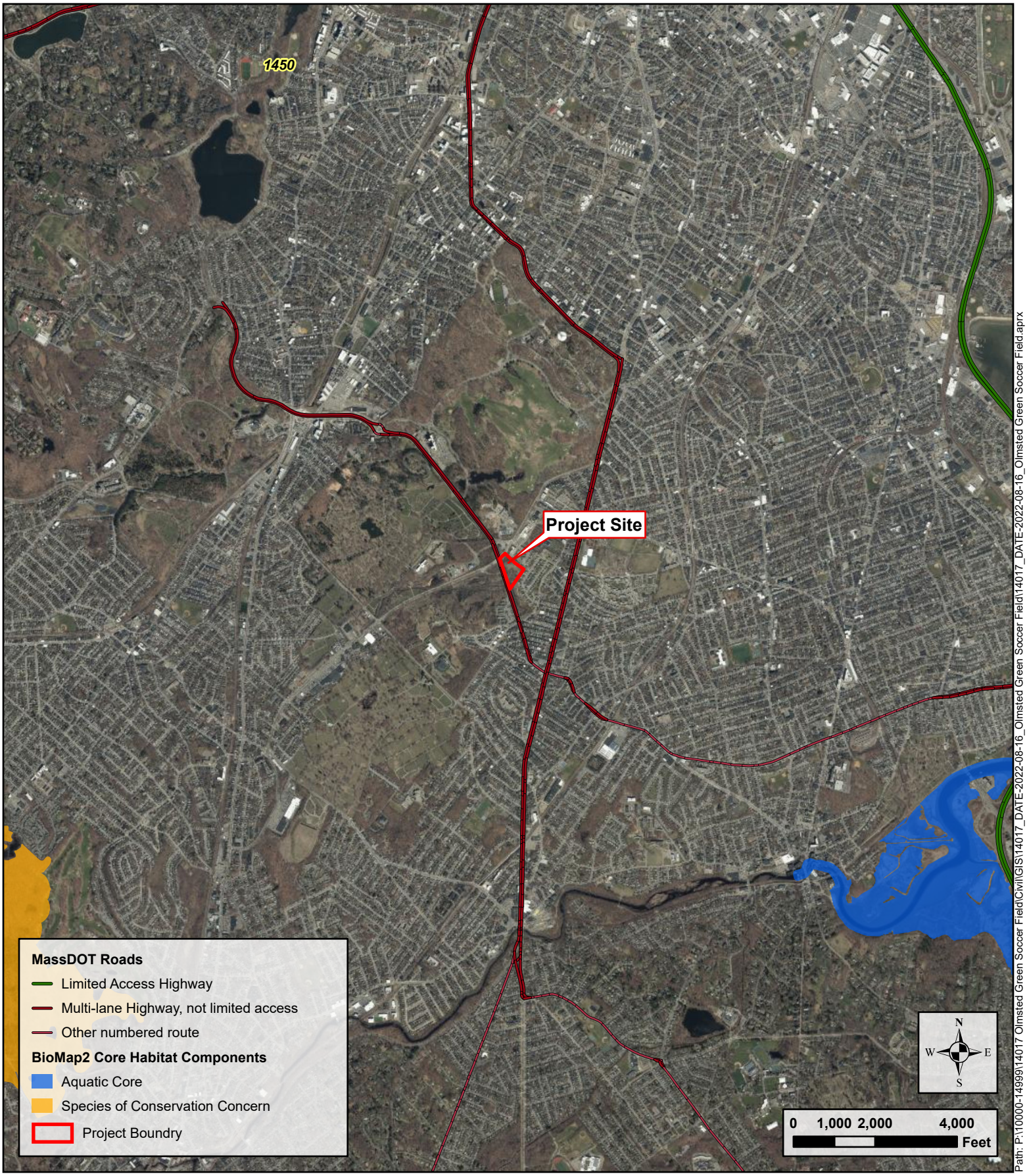


Figure 3: Core Habitats - Species of Conservation Concern Map

8/16/2022

Olmsted Green Soccer Field
West Roxbury

Data Source: MassGIS
Nitsch Project #14017

Nitsch Engineering

Path: P:\10000-14999\14017 Olmsted Green Soccer Field\Civil\GIS\14017_DATE-2022-08-16_Olmsted Green Soccer Field\14017_DATE-2022-08-16_Olmsted Green Soccer Field.aprx

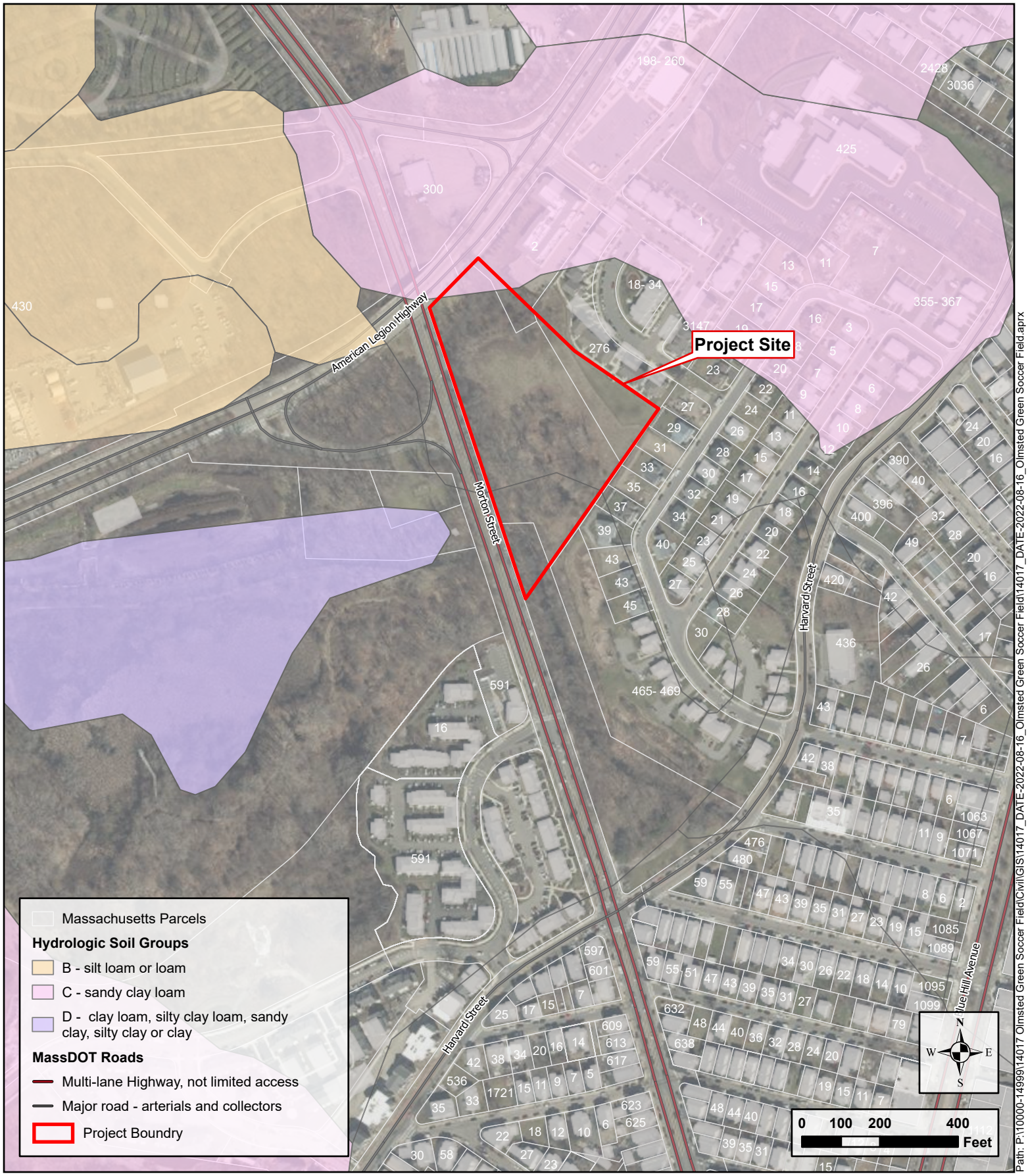
Figure 4: FEMA Flood Hazard

Olmsted Green Soccer Field
West Roxbury

8/16/2022

Data Source: MassGIS
Nitsch Project #14017

Nitsch Engineering



Path: P:\10000-14999\14017 Olmsted Green Soccer Field\Civil\GIS\14017_DATE-2022-08-16_Olmsted Green Soccer Field\14017_DATE-2022-08-16_Olmsted Green Soccer Field.aprx

Figure 5: NRCS Soils

Olmsted Green Soccer Field
West Roxbury

8/16/2022

Data Source: MassGIS
Nitsch Project #14017

Nitsch Engineering