HOWARD STEIN HUDSON
Engineers + Planners

NOTICE OF INTENT

Parkway Apartments

1545-1555 VFW Parkway
West Roxbury, Massachusetts

Submitted to:

City of Boston Conservation Commission
1 City Hall Square, Room 709
Boston, MA, 02201

MassDEP Northeast Regional Office
205B Lowell Street
Wilmington, MA, 01887

Prepared for:

Lincoln Parkway LLC c/o Lincoln Property Company
221 Crescent Street, Suite 102A
Waltham, MA 02453

Prepared by:

Howard Stein Hudson
11 Beacon Street, Suite 1010
Boston, MA 02108
617-482-7080

March 18, 2019

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

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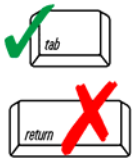
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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):

1545-1555 VFW Parkway — a. Street Address
Boston (West Roxbury) — b. City/Town
02132 — c. Zip Code

Latitude and Longitude:
42.267890 — d. Latitude
-71.171336 — e. Longitude

N/A — f. Assessors Map/Plat Number
2010642010 — g. Parcel /Lot Number

2. Applicant:

John — a. First Name
Noone — b. Last Name
Lincoln Parkway LLC c/o Lincoln Property Company — c. Organization
221 Crescent Street, Suite 102A — d. Street Address
Waltham — e. City/Town
MA — f. State
02453 — g. Zip Code
781-398-2223 — h. Phone Number
N/A — i. Fax Number
jnoone@lpsi.com — j. Email Address

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

James C. Jones and Gerald B. O'Grady III, Trustees — a. First Name
b. Last Name
The James E. Clair Sr. Trust dated 10/12/99 — c. Organization
c/o Tyler & Reynolds, PC, 77 Summer Street, 6th Floor — d. Street Address
Boston — e. City/Town
MA — f. State
02110 — g. Zip Code
N/A — h. Phone Number
N/A — i. Fax Number
N/A — j. Email address

4. Representative (if any):

Richard — a. First Name
Latini — b. Last Name
Howard Stein Hudson — c. Company
11 Beacon Street Suite 1010 — d. Street Address
Boston — e. City/Town
MA — f. State
02108 — g. Zip Code
617-348-3305 — h. Phone Number
i. Fax Number
rlatini@hshassoc.com — j. Email address

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

$2,100.00 — a. Total Fee Paid
$1,037.50 — b. State Fee Paid
$1,062.50 — c. City/Town Fee Paid

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A. General Information (continued)

6. General Project Description:

The existing land is vacant with a dilapidated parking lot. The land is proposed to be redeveloped into two separate four-story residential buildings with 254 total units. A 387-space parking garage is proposed to be surrounded by one of the buildings. The private drive (Avenue A formerly A Street) will be reconstructed to be aligned between the two buildings.

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	34768 and 70574
c. Book	**d. Page Number**
34721	11

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.

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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	1. square feet	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	7,905 1. square feet 2,348 3. cubic feet of flood storage lost	5,111 2. square feet 2,368 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	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: _____ 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. _____

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.

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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

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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

   2017
   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 http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/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.

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

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). 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, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; 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@state.ma.us

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@state.ma.us

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.

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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.

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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.

PARKWAY APARTMENTS, 1545-1555 VFW PARKWAY, WEST ROXBURY, BOSTON, MA
NOI PERMIT SET (SHEETS 1 - 12)

Howard Stein Hudson	Richard E. Latini, P.E.
b. Prepared By	c. Signed and Stamped by
3/15/19	See Plans (generally 1"=20')
d. Final Revision Date	e. Scale

ALTA/NSPS Land Title Survey, 1515 Veterans of Foreign Wars Parkway, Boston, (West Roxbury District) Mass. — July 17, 2017 (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:

#45725	March 11, 2019
2. Municipal Check Number	3. Check date
#45726	March 11, 2019
4. State Check Number	5. Check date
Howard Stein Hudson	
6. Payor name on check: First Name	7. Payor name on check: Last Name

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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
James C. Jones Trustee	3/12/19
3. Signature of Property Owner (if different)	4. Date
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.

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1. Signature of Applicant	2. Date
3. Signature of Property Owner (if different)	4. Date
5. Signature of Representative (if any)	6. Date

For Conservation Commission:
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NOI Wetland Fee Transmittal Form

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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:

1545-1555 VFW PARKWAY	BOSTON (WEST ROXBURY)
a. Street Address	b. City/Town
#45726	$1,037.50 - STATE FEE
c. Check number	d. Fee amount

2. Applicant Mailing Address:

John		Noone
a. First Name		b. Last Name
Lincoln Parkway LLC c/o Lincoln Property Company		
c. Organization		
221 Crescent Street, Suite 102A		
d. Mailing Address		
Waltham	MA	02453
e. City/Town	f. State	g. Zip Code
781-398-2223		jnoone@lpsi.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

James C. Jones and Gerald B. O'Grady, Ttees		
a. First Name		b. Last Name
The James E. Clair Sr. Trust dated 10/12/99		
c. Organization		
c/o Tyler & Reynolds, PC, 77 Summer Street, 6th Floor		
d. Mailing Address		
Boston	MA	02110
e. City/Town	f. State	g. Zip Code
N/A	N/A	N/A
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.

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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
BUILDINGS FOR DEVELOPMENT	2	$1,050.00	$2,100.00

Step 5/Total Project Fee: $2,100.00

Step 6/Fee Payments:

Total Project Fee:	$2,100.00 (a. Total Fee from Step 5)
State share of filing Fee:	$1,037.50 (b. 1/2 Total Fee **less $**12.50)
City/Town share of filling Fee:	$1,062.50 (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.)

Attachment A – Project Narrative

1.0 Project Overview

This Notice of Intent (NOI) has been prepared by Howard Stein Hudson (HSH) on behalf of Lincoln Parkway LLC c/o Lincoln Property Company (the "Applicant") for the proposed Parkway Apartments at 1545-1555 VFW Parkway (the "Project"). The NOI has been prepared in accordance with the Massachusetts Wetland Protection Act (MGL c.131 s.40) and implementing Regulations (310 CMR 10.00) (the "WPA").

The Project will transform a long-vacant site, located on a major transportation artery at the City's gateway with Dedham, into a vibrant residential community that will provide a strong urban edge along the VFW Parkway. A portion of work associated with the Project will occur within a resource area subject to protection under the Massachusetts WPA, specifically "Bordering Land Subject to Flooding." The NOI is being submitted to the City of Boston Conservation Commission to demonstrate compliance with the performance standards of the WPA and its associated regulations under 310 CMR 10.00.

2.0 Existing Conditions

The Project site is an approximately 4.6-acre parcel located in the West Roxbury neighborhood of Boston, bound by the Veterans of Foreign Wars (VFW) Parkway to the east, Dedham Street to the north, Second Street and Boston Trailer Park to the west, and Prime Honda Boston to the south. The Project site currently contains a dilapidated surface parking lot with approximately 90 parking spaces, a private drive (A Street), and open space that was primarily previously disturbed. The surface parking lot is in poor condition and does not appear to be in use. A slope along the site's eastern edge raises the site's grade to meet the elevation of the VFW Parkway (approximately eight feet of total elevation change). Pedestrian walkways currently exist on the east side of the site adjacent to the VFW Parkway and the north side of the site adjacent to the northern edge of Dedham Street. See Figure 2 for an aerial locus map, and Figures 5 through 7 for existing conditions of the Project site.

Resource areas on-site are Bordering Land Subject to Flooding (BLSF). The site is located partially within flood zone AE designated by the National Flood Insurance Program Map Number 25025C0068G effective date September 25, 2009 for Suffolk County. See Figure 10 for FEMA Flood Zone Map and Figure 11 for BLSF area.

The Charles River is located westerly of the site. The site is located entirely outside of the Riverfront Area as the mean annual high-water line is approximately 150 feet from the Project Site at its closest point. *(The Riverfront Area is measured horizontally from the mean annual high-water line to a parallel line 25 feet away in Boston per 310 CMR 10.58(2)(a)3a).* The site is also located outside of any Bordering Vegetated Wetlands and associated 100-foot buffer zone.

The current Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas (MassGIS, 2017) does not identify any areas of estimated habitat (310 CMR 10.59) in or near the Project area.

The existing site contains approximately an acre of impervious surfaces associated with a portion of the driveway entry and an abandoned parking area. The remainder of the site primarily contains areas of gravel and brush. Stormwater runoff from the site primarily flows overland to shallow depressions on-site. When these depressions fill up flow continues westerly towards the Boston Trailer Park. The Boston Trailer Park has a storm drain system that outlets into the Charles River. Refer to the Stormwater Management Report for additional information.

3.0 Proposed Development

The Project will develop the underutilized site with a 254-unit residential neighborhood apartment community in two detached, four-story buildings on either side of A Street. The Project will include 387 garage parking spaces in a five-level internal parking garage, allowing residents direct access to the building. The Project will include modern clubhouse amenities, an outdoor pool, and ample open space. Perspectives of the proposed development and concept of the driveway are shown in Figures 6 through 8.

A stormwater management system will be constructed to treat, detain and infiltrate stormwater runoff to maintain the existing hydrology of the site. The stormwater infiltration systems proposed will exceed the infiltration recommendations of the Boston Planning & Development Agency's Smart Utilities Policy, which recommends infiltrating a volume equal to 1.25 inches of rainfall times the total impervious area of the site. This greatly exceeds MassDEP's Stormwater Management Standard, which only requires an infiltration depth factor of 0.25 inches for the soil types present on the site.

Rooftop runoff will be piped directly to the stormwater infiltration systems. Stormwater runoff from paved areas, such as the proposed driveway, will be captured by deep sump, hooded catch basins and provided additional treatment through proprietary water quality units prior to being directed to the stormwater infiltration systems. The infiltration systems will be provided with outlet control

structures to allow for maximum storage and infiltration and allow bypass overflows to be directed to an adjacent storm drain when volume is exceeded. Figure 4 provided in Attachment B shows locations of planned stormwater management features.

An operation and maintenance plan will be employed to ensure the continued functioning of the stormwater management system. Construction period controls will be used to prevent erosion and transport of sediment and other pollutants off-site or into the wetlands.

A Storm Water Pollution Prevention Plan will be developed as part of the Project's General Permit for Construction Activity under the EPA's NPDES permit program. (see the Stormwater Management Report for additional information).

4.0 Wetland Resource Area Impacts

Portions of the proposed activities will be conducted within Bordering Land Subject to Flooding. This includes a portion of the proposed building and associated grading constructed in the flood storage area which will be replaced along the southwestern property line (see Figure 11 in Attachment B and Sheet C3.01 of the Plans). Permanent impacts from the project are as a result of construction of the new building, driveway and utilities. Temporary impacts from the Project are as a result of grading, and the excavation for the building.

The impacts are presented in Table 1 below in square feet (SF) and are detailed in the following sections.

Table 1. Summary of Resource Area Impacts

RESOURCE AREA IMPACT TABLE			
Resource Area	**Impacts**		
	Temporary	**Permanent**	**Total**
Bordering Land Subject to Flooding	3,587 SF	4,318 SF	7,905 SF

5.0 Compliance with Performance Standards

The following sections describe the project's compliance with the performance standards for each resource area as applicable under Section 310 CMR 10.00 of the Wetlands Protection Act for Land Subject to Flooding (310 CMR 10.57).

5.1 BORDERING LAND SUBJECT TO FLOODING

Bordering Land Subject to Flooding *are defined in 310 CMR 10.57(1.a) as an area which floods from a rise in a bordering waterway or water body. Such areas are likely to be significant to flood control and storm damage prevention.*

Standard 1 per 310 CMR 10.57(4.a.1) – Compensatory storage shall be provided for all flood storage volume that will be lost as the result of a proposed project within Bordering Land Subject to Flooding, when in the judgment of the issuing authority said loss will cause an increase or will contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows.

Compensatory storage has been provided for the project and is shown on sheet C3.01 in Attachment F Permit Plans. As designed, no flood storage will be lost at any stage/elevation at or below the base flood elevation (i.e. the water surface elevation of the 1% annual chance flood).

Standard 2 per 310 CMR 10.57(4.a.2) - Work within Bordering Land Subject to Flooding, including that work required to provide the above-specified compensatory storage, shall not restrict flows so as to cause an increase in flood stage or velocity.

Flood storage provided in southwest corner of project site will be graded in a similar manner as existing conditions, and maintain an unrestricted hydraulic connection to the remaining Bordering Land Subject to Flooding. The work within the BLSF is designed so that it will not restrict flows or cause an increase in the flood stage or velocity.

Standard 3 per 310 CMR 10.57(4.a.3) - Work in those portions of bordering land subject to flooding found to be significant to the protection of wildlife habitat shall not impair its capacity to provide important wildlife habitat functions.

After reviewing the procedures of 310 CMR 10.60 (2) Wildlife Habitat Characteristics of Inland Resource Areas, we do not consider the Bordering Land Subject to Flooding to be (a) Banks, (b) Land Under Bodies or Waterways, (c) Vernal Pool Habitat, (d) Lower Floodplains, or (c) Riverfront Area. Therefore we find the protection of wildlife habitat not to be significant.

6.0 Mitigation Measures

6.1 SEDIMENT BARRIERS

Stormwater discharges during construction will be managed in accordance with a Stormwater Pollution Prevention Plan ("SWPPP") prepared in accordance with the U.S. Environmental Protection Agency NPDES Stormwater Construction General Permit for Massachusetts. A copy of the SWPPP will be provided to the Commission prior to the start of construction. Implementation of the SWPPP will incorporate sedimentation and erosion control measures and other BMPs. Siltation barriers composed of silt fencing and hay bales and will be installed as shown on the Plans prior to the initiation of proposed work. These siltation barriers will demarcate the limit of work, form a work envelope and provide additional assurance that construction equipment will stay within the proposed limit of work. All barriers will remain in place until disturbed areas are stabilized. An adequate stockpile of erosion control materials will be onsite at all times for emergency or routine replacement. Orange construction fencing will also be utilized to demarcate the limit of work in select locations.

6.2 LANDSCAPE MITIGATION

Impacts to the existing open space areas will occur as a result of the installation of the construction of the new building and associated grading. Landscape mitigation will include the planting of new native deciduous shade trees, control and the removal of invasive species, and aeration of soil compacted during construction. Plantings in the flood storage area will be in accordance with 310 CMR 10.55 and the Massachusetts Inland Wetland Replication Guidelines.

6.3 EXTENDED SHUTDOWN STABILIZATION

The contractor must ensure the site is stabilized in the event of extended shutdown due to weather, economic conditions or any other cause.

- Temporary stabilization will be provided through temporary seeding during growing season and chopped hay and/or trackifier during non-growing season.
- Disturbed areas will be kept to a minimum and will be stabilized within fourteen (14) days after construction activities have temporarily or permanently stopped on any portion of the site.
- Stabilization of disturbed areas will be achieved by building cover, paving, riprap slope stabilization, temporary seeding, permanent seeding, mulching (blown hay or woodchips), landscaping or an acceptable equivalent alternative.
- Riprap or other velocity reducing measures will be used where necessary to control erosion.

7.0 Project Construction Sequence

The initial construction phase consists of the proposed driveway, installation of subsurface utilities, and stormwater management system. Construction will be considered complete upon final landscaping and ground surface stabilization. All erosion control measures will be installed prior to the start of construction and maintained throughout the construction process.

General construction sequence:

- Provide construction entrance at point of entry for construction vehicles.
- Remove and dispose trees within proposed construction area and provide tree protection to the trees that will remain on site.
- Clear and grub site and properly dispose of stumps and brush.
- Remove existing bituminous concrete from vacant parking lot.
- Rough grade stormwater management basin berm. Topsoil and subsoil will remain in the bottom of the basin for use as sediment forebay during construction.
- Install new drainage infrastructure. Loam and seed basin embankments as soon as weather conditions permit.
- Stockpile top and subsoil from cleared areas and surround with a silt fence if stockpile is to remain more than forty-eight (48) hours.
- Excavate and install building foundation.
- Rough grade driveway.
- Rough grade off grading.
- Install water, sewer, and other underground utilities and provide utility services.
- Construct buildings.
- Adjust grades within grassed swales, final stabilization as needed.
- Subgrade driveway area.

- Place and roll gravel base and apply binder course to driveway.
- Final grade proposed lawn areas, plant trees, loam and seed, apply hay mulch cover.
- Apply top course to driveway and sidewalks.

The Project will submit a SWPPP before land disturbance begins as required by NPDES Construction General Permit.

8.0 List of Required Local, State, and Federal Permits

Local

Site Plan Approval	Boston Water and Sewer Commission
Building Permit	Boston Inspection Services Department

State

Notice of Intent	Boston Cons. Com. / Mass DEP

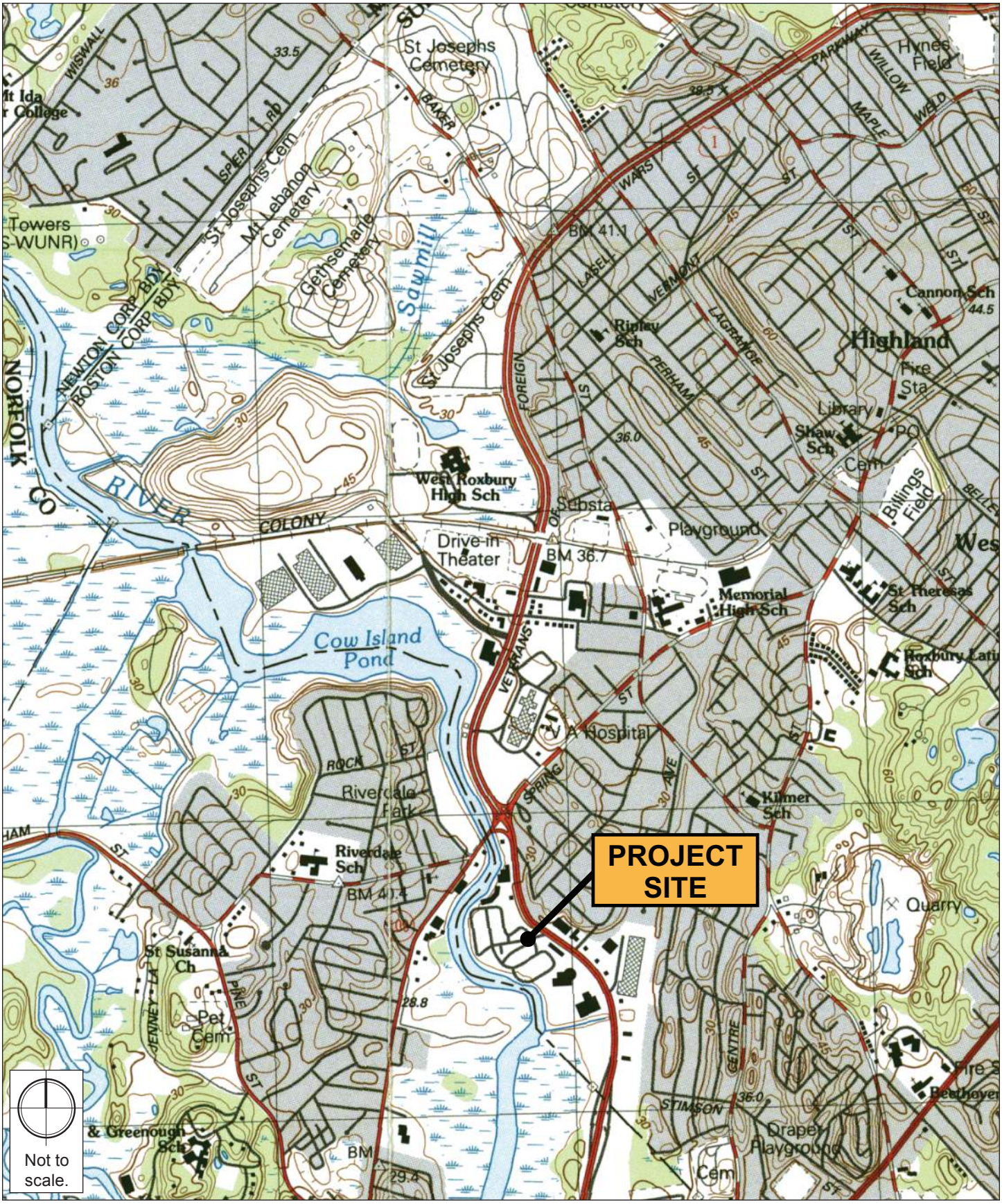
Federal

NPDES Construction General Permit	EPA

9.0 Conclusions

The information contained in this NOI describes the site, proposed work and the effect of said work on the interests identified in the WPA and further demonstrates that the project can be constructed in accordance with the applicable performance standards for the affected resource areas. A clear limit of work line has been provided on the included Plans and appropriate sedimentation and erosion control measures and other BMPs will be employed by the site contractor to avoid impacts to the resource area during construction. The Applicant therefore respectfully requests that the commission issue an Order of Conditions approving the Project with appropriate conditions to protect the interests identified in M.G.L. c. 131 §40.

Attachment B:
Figures and USGS Map



Parkway Apartments / West Roxbury, Massachusetts

HOWARD STEIN HUDSON
Engineers + Planners

Figure 1
Project Locus - USGS Map

Parkway Apartments / West Roxbury, Massachusetts

HOWARD STEIN HUDSON
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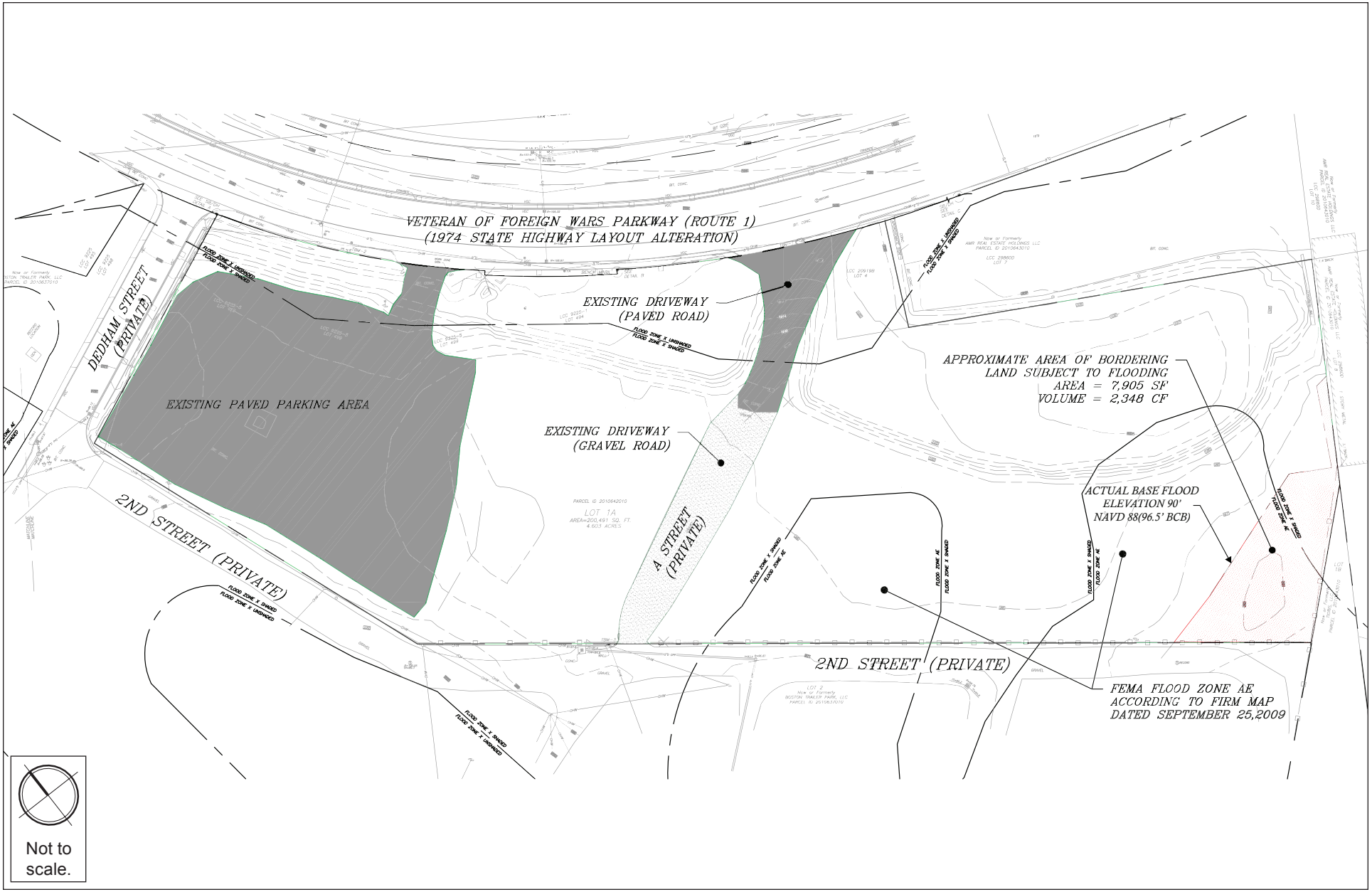
Figure 2
Project Locus - Aerial



Parkway Apartments West Roxbury, Massachusetts

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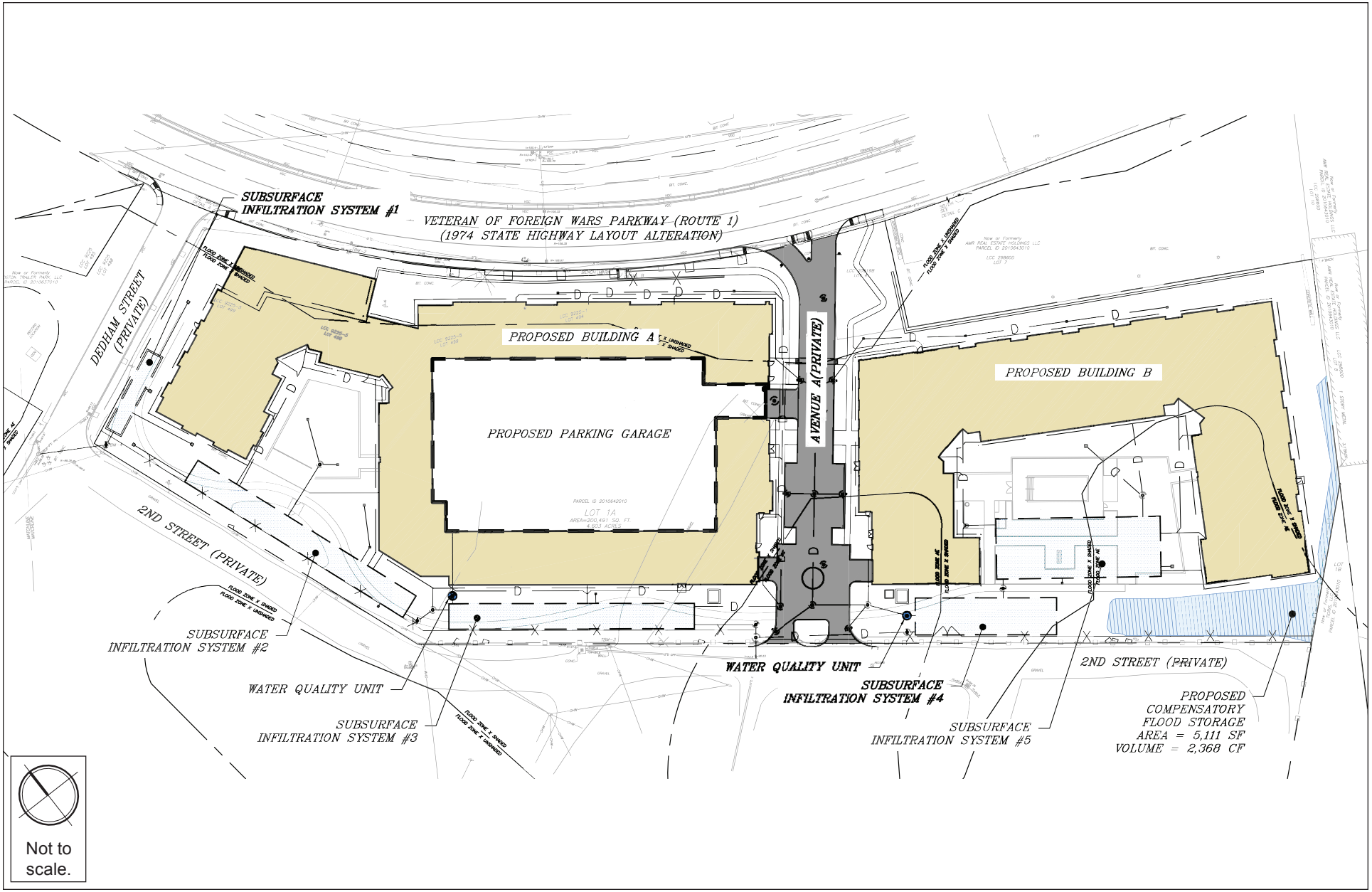
Figure 3
Existing Conditions



Parkway Apartments West Roxbury, Massachusetts

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Figure 4
Proposed Conditions

Parkway Apartments West Roxbury, Massachusetts

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Figure 5
Existing Conditions Facing South

Parkway Apartments West Roxbury, Massachusetts

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Figure 6
Existing Conditions Facing East

Parkway Apartments West Roxbury, Massachusetts

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Figure 7
Existing Conditions Facing North

Not to scale.

Parkway Apartments West Roxbury, Massachusetts

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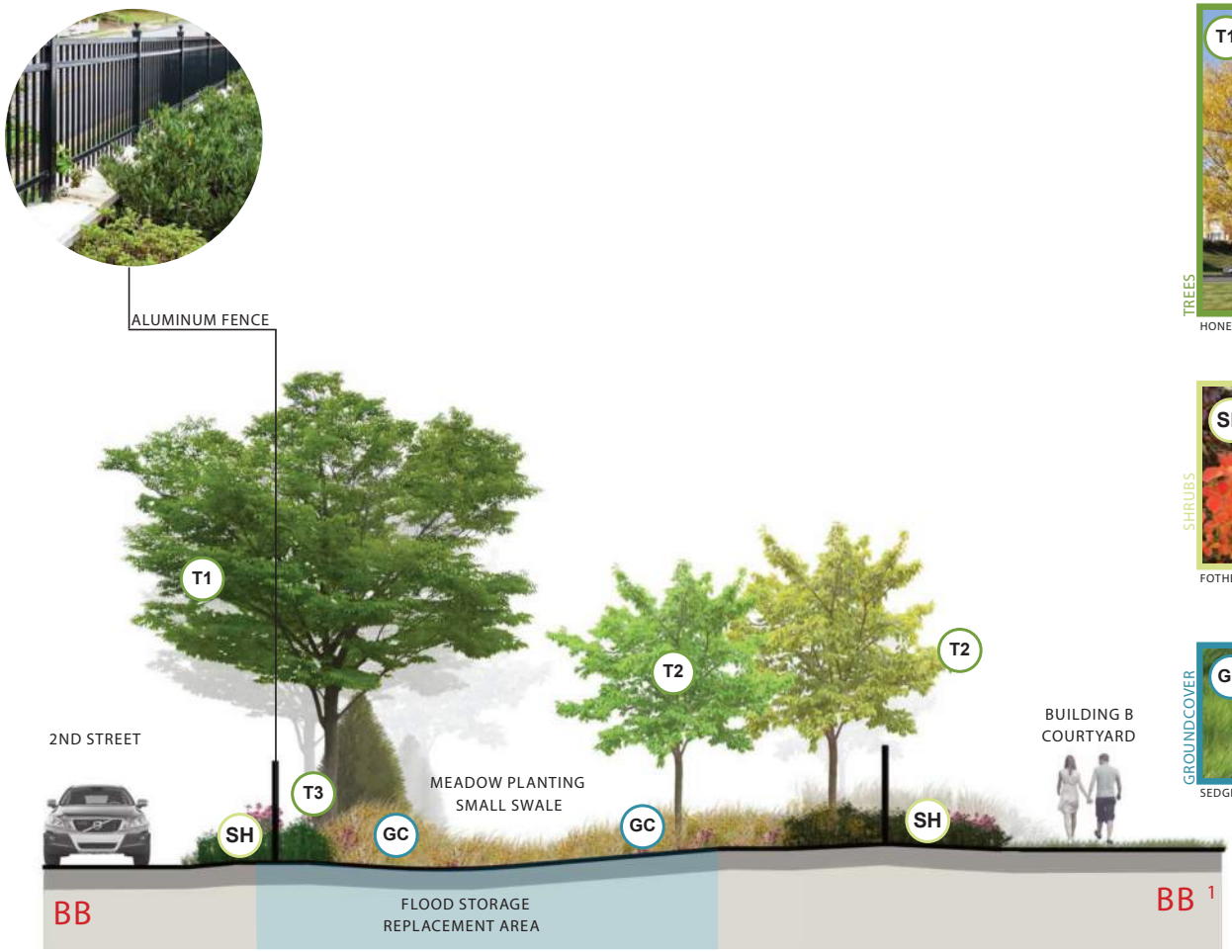
LandDesign

Figure 8
Landscape Plan



*MATERIALS AND PLANT MATERIAL SUBJECT TO CHANGE IN CONSTRUCTION DOCUMENTATION PHASE

Parkway Apartments West Roxbury, Massachusetts

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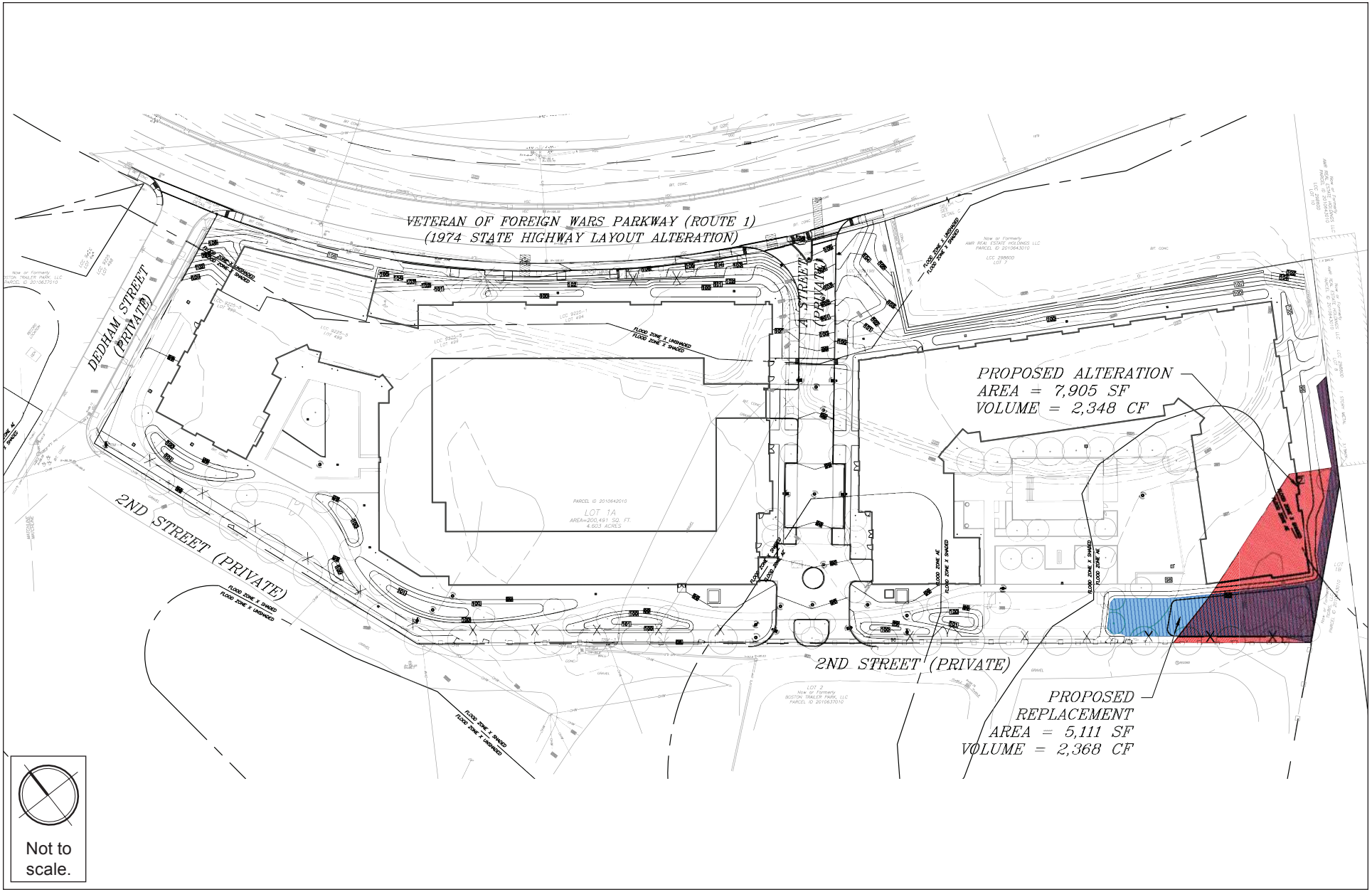
LandDesign

Figure 9
Landscape Plan



Parkway Apartments West Roxbury, Massachusetts

HOWARD STEIN HUDSON
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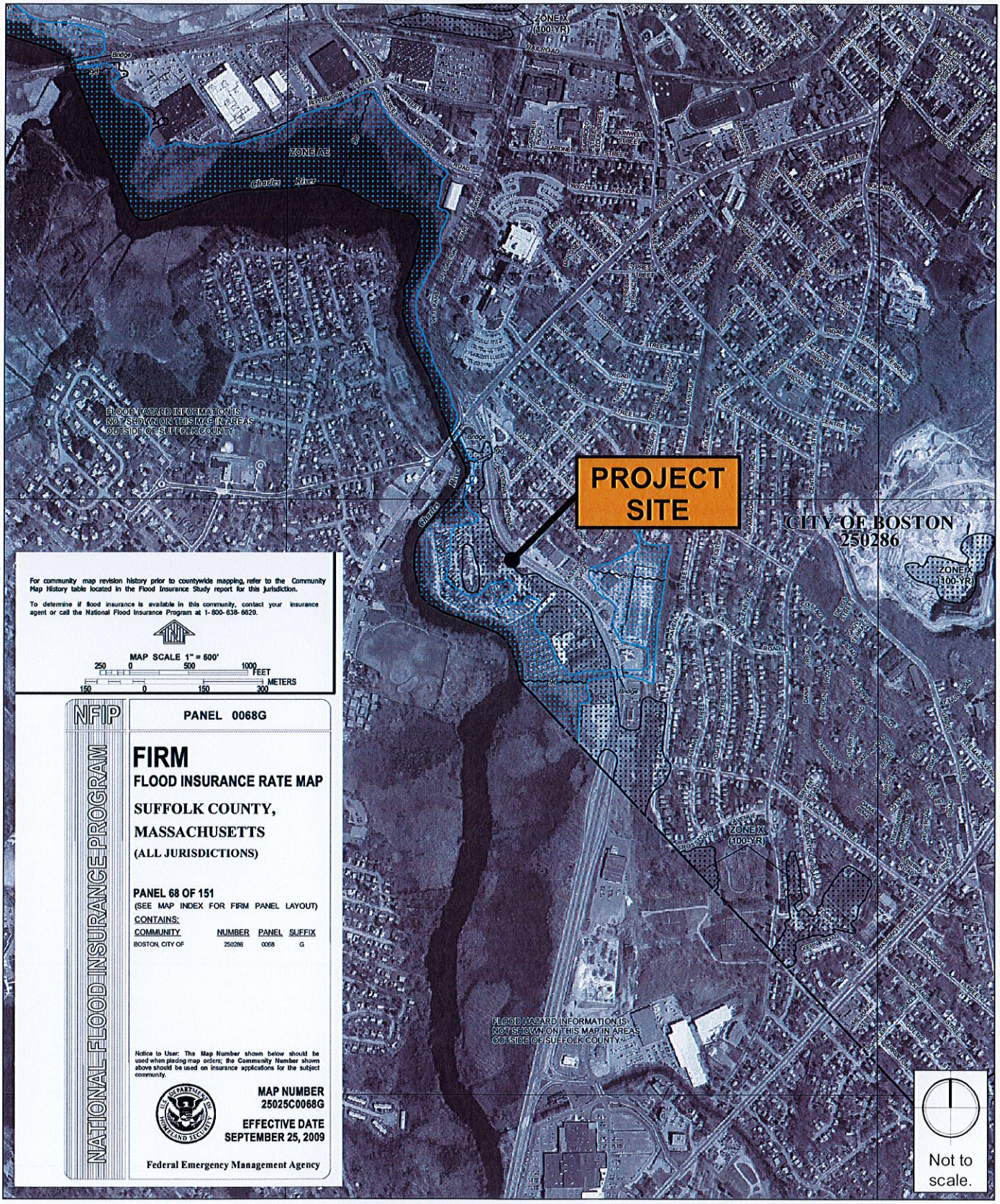
Figure 10
Bordering Land Subject to Flooding Area



Parkway Apartments / West Roxbury, Massachusetts

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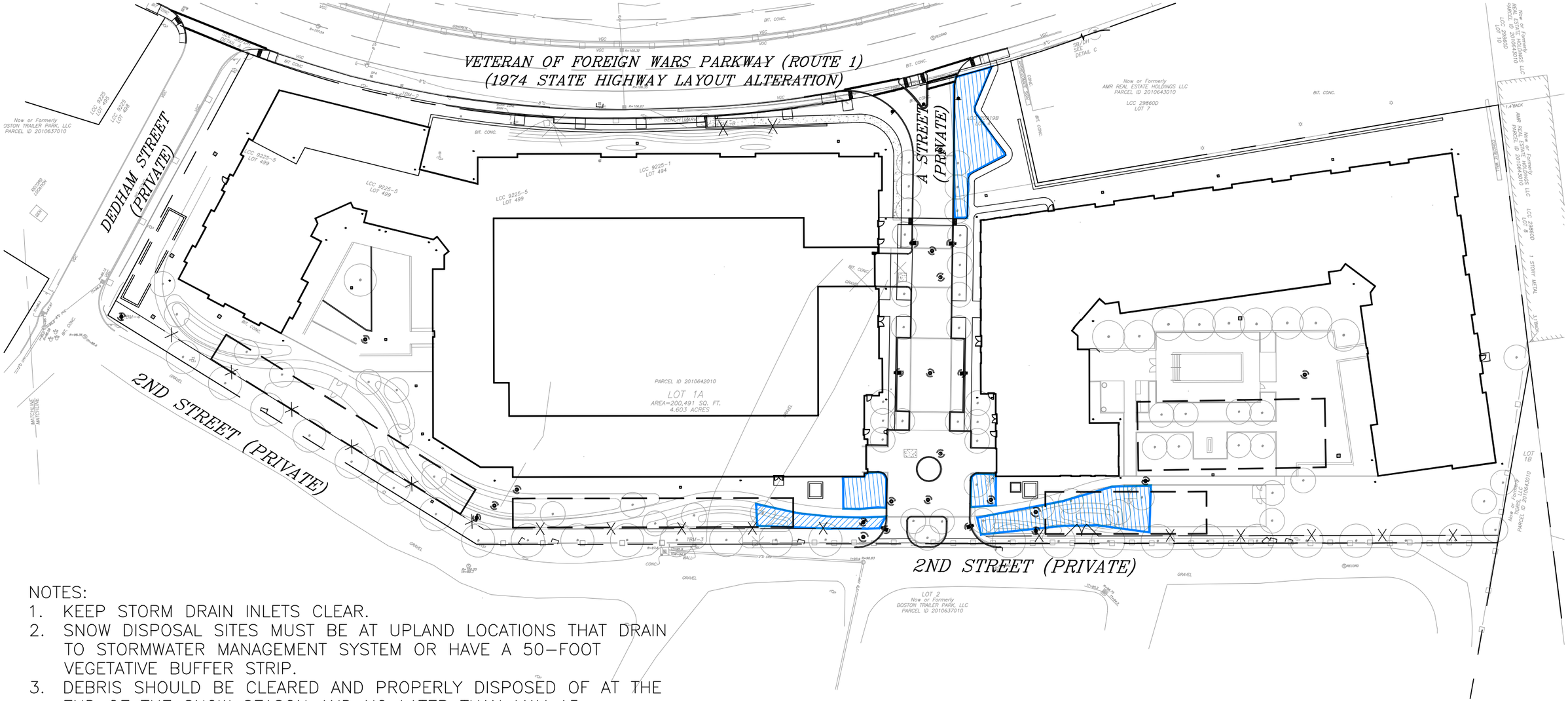
Figure 11
FEMA Map

Attachment C:
Snow Storage Plan

Figure S□1 ***SNO□ STOR□GE PL□N***



NOTES:
1. KEEP STORM DRAIN INLETS CLEAR.
2. SNOW DISPOSAL SITES MUST BE AT UPLAND LOCATIONS THAT DRAIN TO STORMWATER MANAGEMENT SYSTEM OR HAVE A 50-FOOT VEGETATIVE BUFFER STRIP.
3. DEBRIS SHOULD BE CLEARED AND PROPERLY DISPOSED OF AT THE END OF THE SNOW SEASON AND NO LATER THAN MAY 15.
4. PRIOR TO APRIL 1ST, ALL SAND AND SALT FROM WINTER APPLICATION MUST BE REMOVED FROM THE SITE.

3/11/2019 L:\17163\Current\CUTSHEET\Figure □\Snow Storage Plan.dwg
Jay Carroll

HOWARD STEIN HUDSON

Approximate Scale: 1" = 60'-0"
Date: □-□-2019
Engineers + Planners

Attachment D:
Climate Resiliency Checklist

Boston Planning & Development Agency
Climate Resiliency Report Summary

Submitted: 08/29/2018 12:06:19

A.1 - Project Information

Project Name:	The Parkway Apartments			
Project Address:	1507 VFW Parkway			
Filing Type:	Initial (PNF, EPNF, NPC or other substantial filing)			
Filing Contact:	Talya Moked	Epsilon Associates	tmoked@epsilonassociates.com	9784616223
Is MEPA approval required?	Yes	MEPA date:	08/31/2018	

A.2 - Project Team

Owner / Developer:	Lincoln Parkway, LLC
Architect:	SK&I Architecture
Engineer:	R. W. Sullivan Engineering
Sustainability / LEED:	SK&I Architecture/R. W. Sullivan Engineering
Permitting:	Epsilon Associates, Inc.
Construction Management:	LPC Contractors of Northeast, Inc.

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Residential
List the First Floor Uses:	Residential, residential lobby, parking, amenity spaces
List any Critical Site Infrastructure and or Building Uses:	

Site and Building:

Site Area (SF):	200376	Building Area (SF):	351000
Building Height (Ft):	45	Building Height (Stories):	4
Existing Site Elevation – Low (Ft BCB):	95.9	Existing Site Elevation – High (Ft BCB):	109.0
Proposed Site Elevation – Low (Ft BCB):	95.9	Proposed Site Elevation – High (Ft BCB):	109.0
Proposed First Floor Elevation (Ft BCB):	98.5	Below grade spaces/levels (#):	0

Article 37 Green Building:

LEED Version - Rating System:	LEED v4 New Construction	LEED Certification:	

Boston Planning & Development Agency
Climate Resiliency Report Summary

boston planning & development agency

Proposed LEED rating:	Certified	Proposed LEED point score (Pts.):	40

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:	49	Exposed Floor :	30
Foundation Wall:	7.5ci	Slab Edge (at or below grade):	10 for 24" below

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

Area of Opaque Curtain Wall & Spandrel Assembly:	0	Wall & Spandrel Assembly Value:	0.64
Area of Framed & Insulated / Standard Wall:	60	Wall Value:	21
Area of Vision Window:	39	Window Glazing Assembly Value:	0.45
		Window Glazing SHGC:	0.40
Area of Doors:	1	Door Assembly Value :	0.37

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	Electrical energy usage loads were determined using calculations as required by the National Electric Code (2017 Version) for a multi-family dwelling unit.		
Annual Electric (kWh):	18336	Peak Electric (kW):	1300
Annual Heating (MMbtu/hr):	7500	Peak Heating (MMbtu):	8000
Annual Cooling (Tons/hr):	575	Peak Cooling (Tons):	620
Energy Use - Below ASHRAE 90.1 - 2013 (%):	15	Have the local utilities reviewed the building energy performance?:	No
Energy Use - Below Mass. Code (%):	12	Energy Use Intensity (kBtu/SF):	6500

Back-up / Emergency Power System

Electrical Generation Output (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 greenhouse gas emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon-neutrality by 2050 the performance of new buildings will need to progressively improve to carbon net zero and net positive.

B.1 – GHG Emissions - Design Conditions

For this filing - Annual Building GHG Emissions (Tons):

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

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

The Project includes natural ventilation and light in all bedrooms and living rooms in excess of code requirements, as well as increased insulation in the roof cavity, and a high reflectance roof.

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

The Project will include high efficiency gas water heaters and air conditioning units.

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

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

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

The Project team has reached out to MASSAVE to discuss potential energy efficiency incentives.

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):

The Project is specifying low energy equipment, appliances, programmable thermostats, and low energy lighting. The Project will continue to adapt as the performances of these items improve.

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 (Deg.):	8	Temperature Range - High (Deg.):	91
Annual Heating Degree Days:		Annual Cooling Degree Days	

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

Days - Above 90° (#):	60	Days - Above 100° (#):	30
Number of Heatwaves / Year (#):	6	Average Duration of Heatwave (Days):	5

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

Two new landscaped courtyards will be provided and building roofing material will have a higher Solar Reflectance Index. The site will provide over 76,000 sf of landscaped area which is approximately 40% of the total site area.

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:

The Project will use low energy equipment, appliances, and low energy lighting to lessen internal heat gains from sources. Use of reflective glazing and light blocking internal shades to prevent SHG.

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:

The Project will use high performance equipment, operable windows, and light blocking internal shades.

D - Extreme Precipitation Events

Boston Planning & Development Agency
Climate Resiliency Report Summary

boston planning & development agency

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

What is the project design precipitation level? (In. / 24 Hours)	6

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

There will be a stormwater management system on site to infiltrate the first inch of runoff from impervious areas. The project is looking into feasibility of two sub-surface infiltration systems and additional rain gardens.

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 team is studying the feasibility of additional stormwater retention, infiltration, and storage, including rain gardens, storage basins, and other infrastructure.

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, the sea level 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 Special Flood Hazard Area?	Yes	What Zone:	AE
What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)?			96.45
Is any portion of the site in the BPDA Sea Level Rise Flood Hazard Area (see SLR-FHA online map)?	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 by the Sea Level Rise Flood Hazard Area (SLR-FHA), which includes 3.2' of sea level rise above 2013 tide levels, an additional 2.5" to account for subsidence, and the 1% Annual Chance Flood. After using the SLR-FHA to identify a project's Sea Level Rise Base Flood Elevation, proponents should calculate the Sea Level Rise Design Flood Elevation by adding 12" of freeboard for buildings, and 24" of freeboard for critical facilities and infrastructure and any ground floor residential units.

What is the Sea Level Rise - Base Flood Elevation for the site (Ft BCB)?	96.46		
What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)?	98.5	First Floor Elevation (Ft BCB):	98.5
What are the Site Elevations at Building (Ft BCB)?	95.9-109.0	What is the 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.:

The first floor elevation of the buildings will be approximately 2 feet higher than the 100 year flood plain. Critical systems, electric, cable, and other utility services located below design flood elevation, if any, may be dry flood proofed. To the extent feasible, critical systems will be located at 2 feet above base flood elevation.

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.:

The Project will be looking into backflow preventers at stormwater outfalls and compensatory storage to maintain flood storage levels in project area.

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:

The Proponent has an on-call response team for each property that responds as soon as an event occurs. They also have two disaster recovery contractors who handle all emergency situations in the Northeast.

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:

Boston Planning & Development Agency

Climate Resiliency Report Summary

Thank you for completing the Boston Climate Change Checklist!

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

Attachment E:
Abutter Notification Information

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA
ABUTTER MAILING LIST

PID	OWNER	ADDRESSEE	MLG_ADDRESS	MLG_CITYSTATE	MLG ZIPCODE	LOC_ADDRESS	LOC_CITY	LOC ZIPCODE
2010640000	TIGRIS LLC	C/O TIGRIS LLC	420 LAKESIDE AV STE 302	MARLBOROUGH MA	1752	1505 VFW PW	WEST ROXBURY	2132
2010655010	VFW PARKWAY CONDOMINIUM LLC	C/O VFW PKWY CONDO LLC	1522 VFW PKWY	WEST ROXBURY MA	2132	1522 VFW PW	WEST ROXBURY	2132
2010662000	FAHEY KATHLEEN P TS	C/O KATHLEEN P FAHEY TS	81 CALEDONIAN AV	WEST ROXBURY MA	2132	81 CALEDONIAN AV	WEST ROXBURY	2132
2010637001	FOURTEEN 59 REALTY	C/O CHARLES RIVER REALTY	PO BOX 262	NORWOOD MA	2062	1459 VFW PW	WEST ROXBURY	2132
2010655000	WROX LLC	C/O WROX LLC	65 EAST BELCHER ROAD	FOXBOROUGH MA	2035	1524 VFW PW	WEST ROXBURY	2132
2010663000	BUKALA DANIEL J		85 CALEDONIAN AV	WEST ROXBURY MA	2132	85 CALEDONIAN AV	WEST ROXBURY	2132
2010642010	BOISVERT ROSARIO J TS	C/O JAMES C JONES	PO BOX 543	WINCHESTER MA	1890	VFW PW	WEST ROXBURY	2132
2010637010	BOSTON TRAILER PARK TENTANTS	C/O BOSTON TRAILER PK TENANTS	1515 VFW PARKWAY #R-77	WEST ROXBURY MA	2132	1515 VFW PW	WEST ROXBURY	2132
2010641000	TIGRIS LLC	C/O TIGRIS LLC	420 LAKESIDE AV STE 302	MARLBOROUGH MA	1752	VFW PW	WEST ROXBURY	2132
2010643010	AMR REAL ESTATE HOLDINGS LLC	C/O MATTHEW MCGOVERN	425 PROVIDENCE HW	WESTWOOD MA	2090	1525 VFW PW	WEST ROXBURY	2132

Notification to Abutters
Under the Massachusetts Wetlands Protection

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, you are hereby notified of the following:

A. The name of the Applicant is the **Lincoln Parkway LLC c/o Lincoln Property Company.**

B. The Applicant 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).**

C. The address of the lot where the activity is proposed is **1545-1555 VFW Parkway.**

D. The Project includes the Development of a new apartment complex on an empty lot of land and development of a private drive (Avenue A) located at 1545-1555 VFW Parkway.

E. A **Public Hearing** is scheduled for **Wednesday, April 3rd, 2019.** Additional information regarding the time and place of the public hearing may be obtained by calling the Boston Conservation Commission office at (617) 635-3850 or visiting the Boston Conservation Commission website at https://www.boston.gov/departments/environment/conservation-commission.

F. Copies of the Notice of Intent may be examined at **Boston Conservation Department Office at Boston City Hall, One City Hall Square, Room 709, Boston**.

G. Or copies of the Notice of Intent may be obtained from The Applicant's representative by calling **(617) 482-7080 (Rick Latini)** between the hours of 9:00 A.M. to 5:00 P.M. Monday through Friday.

H. Person sending this notification (applicant, representative, or other):

Name: **Howard Stein Hudson (Attn: Rick Latini)**
Address: **11 Beacon Street, Suite 1010**
City: **Boston** State: **MA** Zip: **02108**
Phone: **(617)-482-7080**

NOTES:

- Public Hearing Notice, including its date, time and place, will be published at least 5 days in advance of the first hearing in a newspaper of general circulation.
- Notice of the public hearing, including date, time, and place will be posted in City Hall not less that forty-eight hours in advance.
- You may also contact the Boston Conservation Commission or the MA Department of Environmental Protection (MassDEP) Northeast Region Office at (978) 694-3200 for more information about this application or the Wetlands Protection Act.

AFFIDAVIT OF SERVICE
FOR ABUTTER NOTIFICATION

Under the Massachusetts Wetlands Protection Act

(To be submitted to the Massachusetts Department of Environmental Protection)

I, Richard E. Latini, P.E., on behalf of Lincoln Parkways LLC, hereby certify under the pains and penalties of perjury that on March 19, 2019, I gave Notification to abutters in compliance with second paragraph of Massachusetts General Laws Chapter 131, Section 40 and the DEP Guide to Abutter Notification dated April 8, 1994 and 310 CMR 10.05(4)(a) in connection with the following matter:

> **A Notice of Intent** filed under the Massachusetts Wetlands Protection Act by **Lincoln Parkway LLC c/o Lincoln Property Company with the Boston Conservation Commission on March 19, 2019** for the property located at **1545-1555 VFW Parkway in Boston, MA**.

The Abutter Notification Letter and the list of abutters to whom it was given and their addresses are attached to this Affidavit of Service.

Richard E. Latini, P.E.

3/19/19
Date

Attachment F:
NOI Permit Drawings

PROVIDED UNDER SEPARATE COVER

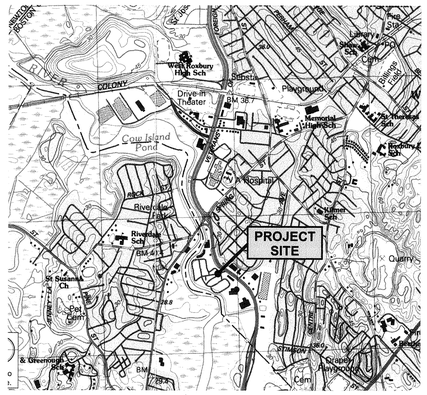
Attachment G:
Stormwater Management Report & Checklist

PROVIDED UNDER SEPARATE COVER

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA

NOI PERMIT SET

SHEET INDEX



LOCUS MAP
NOT TO SCALE

ASSESSORS INFORMATION
WARD: 20 PARCEL: 2010642010

REFERENCES
1. TOPOGRAPHIC AND PROPERTY LINE OBTAINED FROM A PLAN ENTITLED "ALTA/NSPS LAND TITLE SURVEY, 1515 VETERANS OF FOREIGN WARS PARKWAY, BOSTON (WEST ROXBURY DISTRICT) MASS." BY FELDMAN LAND SURVEYORS DATED JULY 31, 2017 REVISED THROUGH MAY 16, 2018.

HOWARD STEIN HUDSON
11 Beacon Street, Suite 1010
Boston, MA 02108
www.hshassoc.com

PREPARED FOR:

LINCOLN PARKWAY LLC
C/O LINCOLN PROPERTY COMPANY
221 CRESCENT ST, SUITE 102A
WALTHAM, MA 02453

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
3/21/19

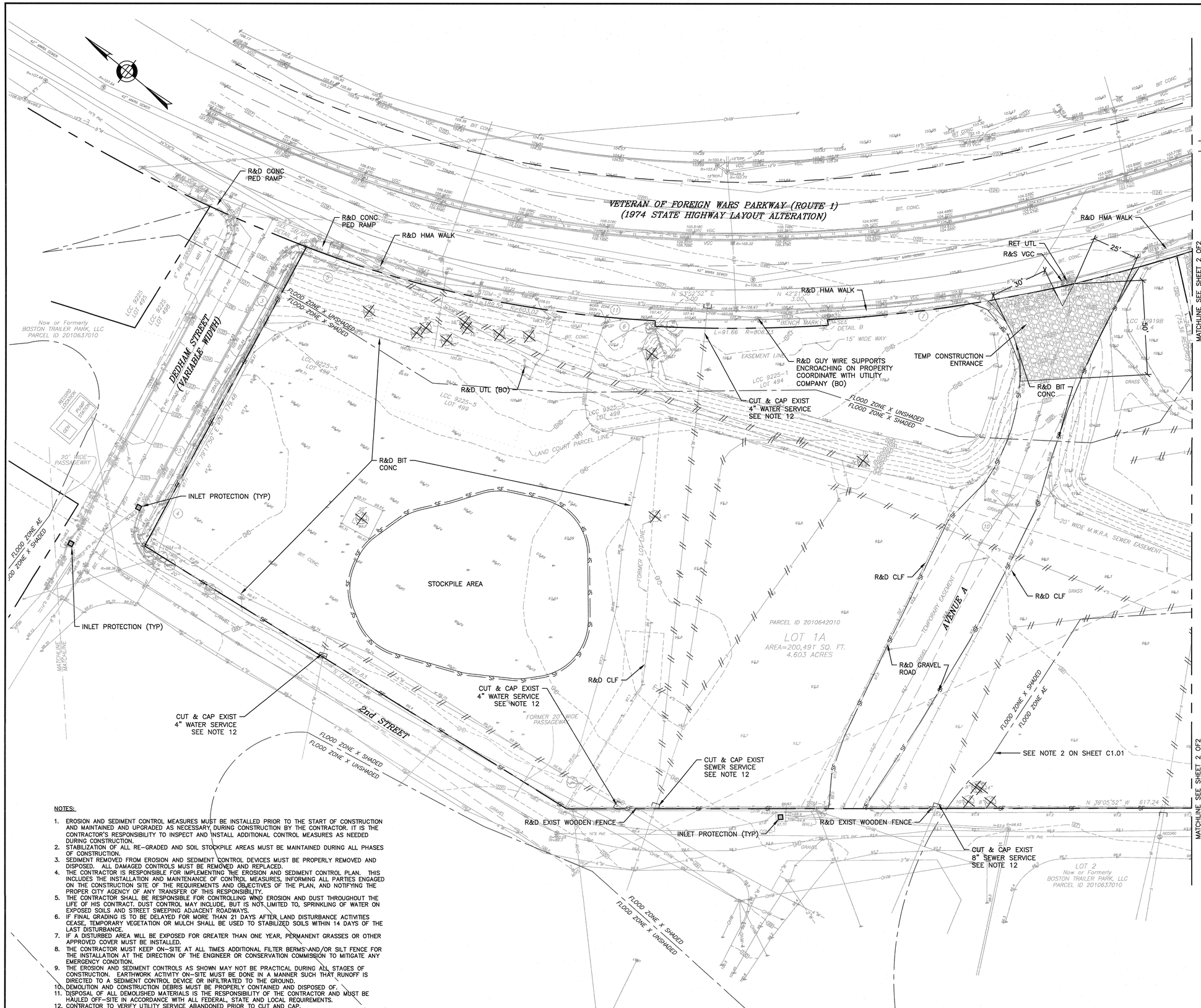
NOI PERMIT SET

TITLE

DATE:	11/30/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	JEC
CHECKED BY:	RL

C0.01
SHEET 1 OF 12

3/21/2019 L:\17163\Current\CAD\TSHEET\17163 TITLE.dwg



LEGEND

ABAN	ABANDON
R&D	REMOVE & DISPOSE
R&S	REMOVE & STACK
ADJ	ADJUST
EXIST	EXISTING
L.O.W.	LIMIT OF WORK
CONC	CONCRETE
℄	CUT & CAP UTILITY LINE
SF	SILT FENCE
	TEMPORARY CONSTRUCTION FENCE
	CATCH BASIN FILTER
	ROCK CONSTRUCTION ENTRANCE
// // //	ABANDON
	R&D EXIST. DRAIN LINE
	PROPERTY LINE
	R&D WALL
	R&D TREE & STUMP

NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED AND UPGRADED AS NECESSARY DURING CONSTRUCTION BY THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND INSTALL ADDITIONAL CONTROL MEASURES AS NEEDED DURING CONSTRUCTION.
2. STABILIZATION OF ALL RE-GRADED AND SOIL STOCKPILE AREAS MUST BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
3. SEDIMENT REMOVED FROM EROSION AND SEDIMENT CONTROL DEVICES MUST BE PROPERLY REMOVED AND DISPOSED. ALL DAMAGED CONTROLS MUST BE REMOVED AND REPLACED.
4. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THE EROSION AND SEDIMENT CONTROL PLAN. THIS INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER CITY AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING WIND EROSION AND DUST THROUGHOUT THE LIFE OF HIS CONTRACT. DUST CONTROL MAY INCLUDE, BUT IS NOT LIMITED TO, SPRINKLING OF WATER ON EXPOSED SOILS AND STREET SWEEPING ADJACENT ROADWAYS.
6. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN 21 DAYS AFTER LAND DISTURBANCE ACTIVITIES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZED SOILS WITHIN 14 DAYS OF THE LAST DISTURBANCE.
7. IF A DISTURBED AREA WILL BE EXPOSED FOR GREATER THAN ONE YEAR, PERMANENT GRASSES OR OTHER APPROVED COVER MUST BE INSTALLED.
8. THE CONTRACTOR MUST KEEP ON-SITE AT ALL TIMES ADDITIONAL FILTER BERMS AND/OR SILT FENCE FOR THE INSTALLATION AT THE DIRECTION OF THE ENGINEER OR CONSERVATION COMMISSION TO MITIGATE ANY EMERGENCY CONDITION.
9. THE EROSION AND SEDIMENT CONTROLS AS SHOWN MAY NOT BE PRACTICAL DURING ALL STAGES OF CONSTRUCTION. EARTHWORK ACTIVITY ON-SITE MUST BE DONE IN A MANNER SUCH THAT RUNOFF IS DIRECTED TO A SEDIMENT CONTROL DEVICE OR INFILTRATED TO THE GROUND.
10. DEMOLITION AND CONSTRUCTION DEBRIS MUST BE PROPERLY CONTAINED AND DISPOSED OF.
11. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE HAULED OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
12. CONTRACTOR TO VERIFY UTILITY SERVICE ABANDONED PRIOR TO CUT AND CAP.

20 0 20 40
SCALE IN FEET

HOWARD STEIN HUDSON
11 Beacon Street, Suite 1010
Boston, MA 02108
www.hshassoc.com

PREPARED FOR:

LINCOLN PARKWAY LLC
C/O LINCOLN PROPERTY COMPANY
221 CRESCENT ST, SUITE 102A
WALTHAM, MA 02453

PARKWAY APARTMENTS

1545-1555 VFW PARKWAY, WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

RICHARD E. LATINI
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
3/21/19

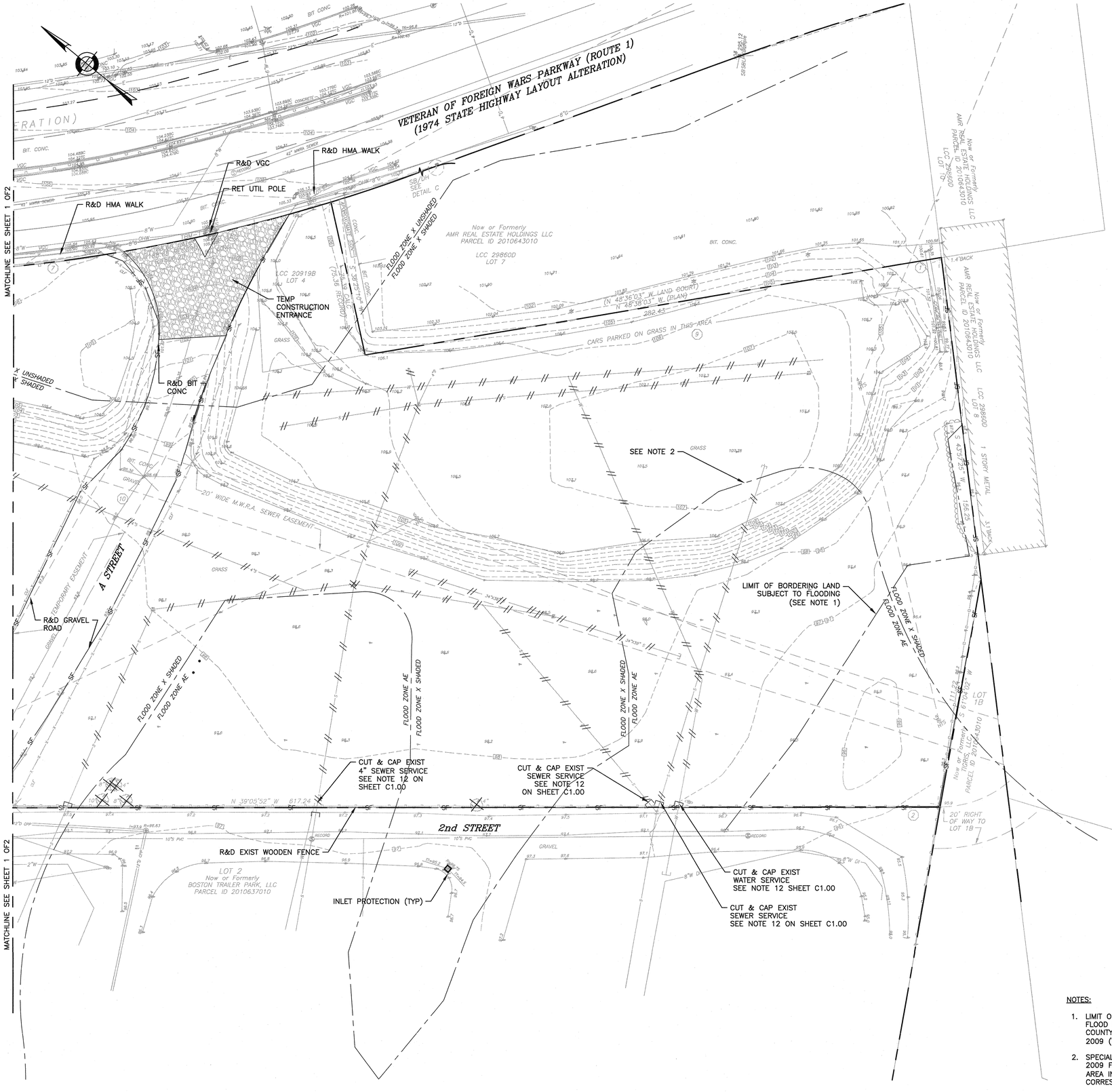
NOI PERMIT SET

SITE PREPARATION PLAN - 1

DATE:	12/18/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HKV
CHECKED BY:	RL

C1.00
SHEET 2 OF 12

3/21/2019 L:\17163\Current\CIVIL\SHEET\17163 SITE PREP PLAN.dwg



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PARKWAY APARTMENTS

1545-1555 VFW PARKWAY, WEST ROXBURY, BOSTON, MA, 02132
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REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

RICHARD E. LATINI
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
3/21/19

NOI PERMIT SET

SITE PREPARATION PLAN - 2

NOTES:

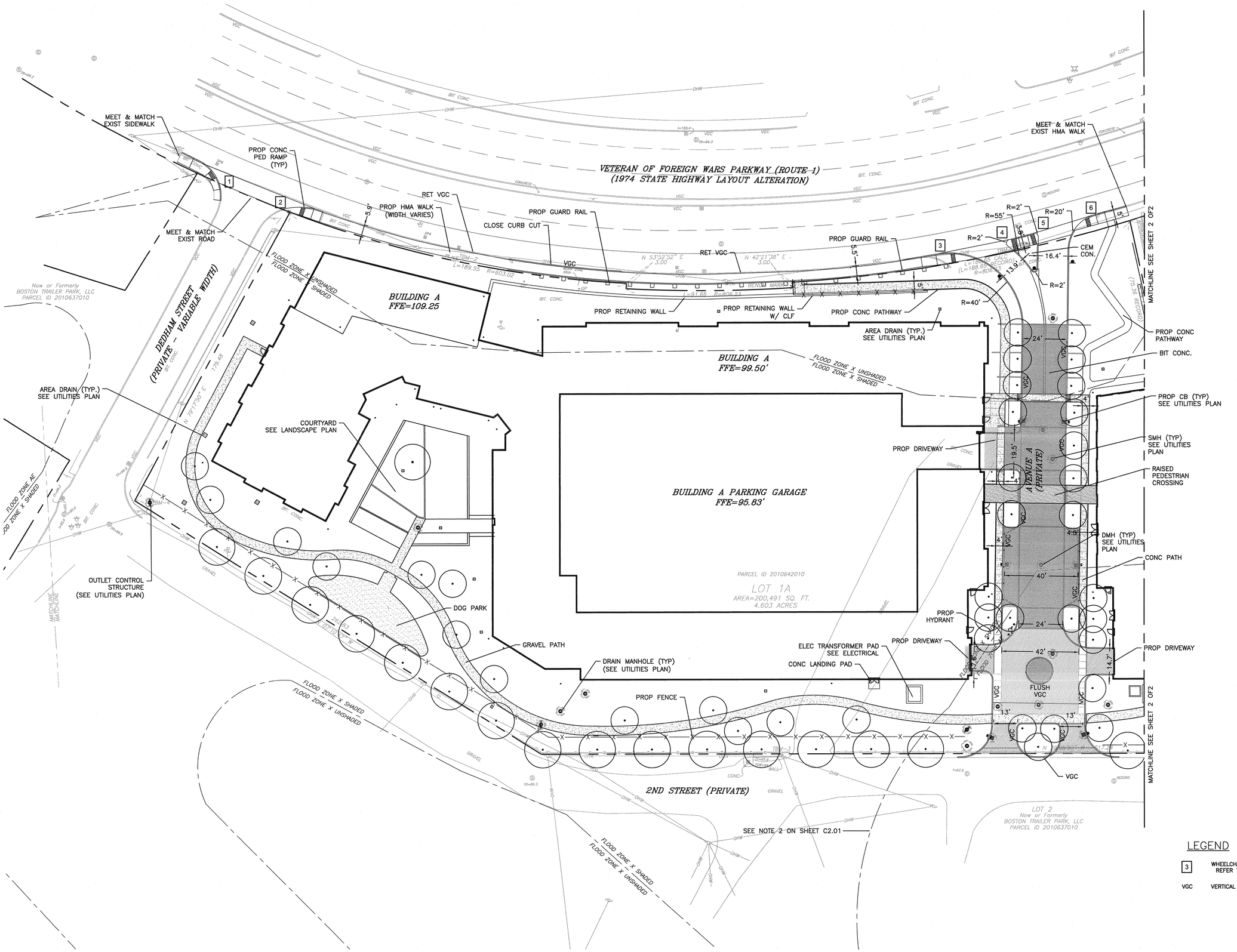
1. LIMIT OF BORDERING LAND SUBJECT TO FLOODING (BLSF) DETERMINED BY THE BASE FLOOD ELEVATION PROVIDED ON THE FEMA FLOOD INSURANCE RATE MAP, SUFFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25025C0068G, AND DATED SEPTEMBER 25, 2009 (THE "FIRM"), 90' NAVD 1988 (96.5' BCB), AND FIELD SURVEY.
2. SPECIAL FLOOD HAZARD AREA BASED ON GRAPHIC PLOTTING FROM THE SEPTEMBER 25, 2009 FIRM. HOWEVER, THE BASE FLOOD ELEVATION DETERMINED BY FEMA FOR THIS AREA IN THE FIRM (AND USED IN BLSF DELINEATION, SEE NOTE 1) DOES NOT CORRESPOND TO THIS 2009 FEMA GRAPHIC REPRESENTATION.

20 0 20 40
SCALE IN FEET

DATE:	12/18/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HKV
CHECKED BY:	RL

C1.01

3/21/2019 L:\17163\Current\CUTSHEET\17163 SITE PREP PLAN.dwg



LEGEND

3	WHEELCHAIR RAMP # REFER TO DETAILS
VGC	VERTICAL GRANITE CURB

HOWARD STEIN HUDSON
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221 CRESCENT ST, SUITE 102A
WALTHAM, MA 02453

PARKWAY APARTMENTS

1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
1	JC	2/26/19	MASSDOT RESUBMITTAL
2	JC	3/12/19	MASSDOT RESUBMITTAL
3	JC	3/15/19	NOTICE OF INTENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
3/21/19

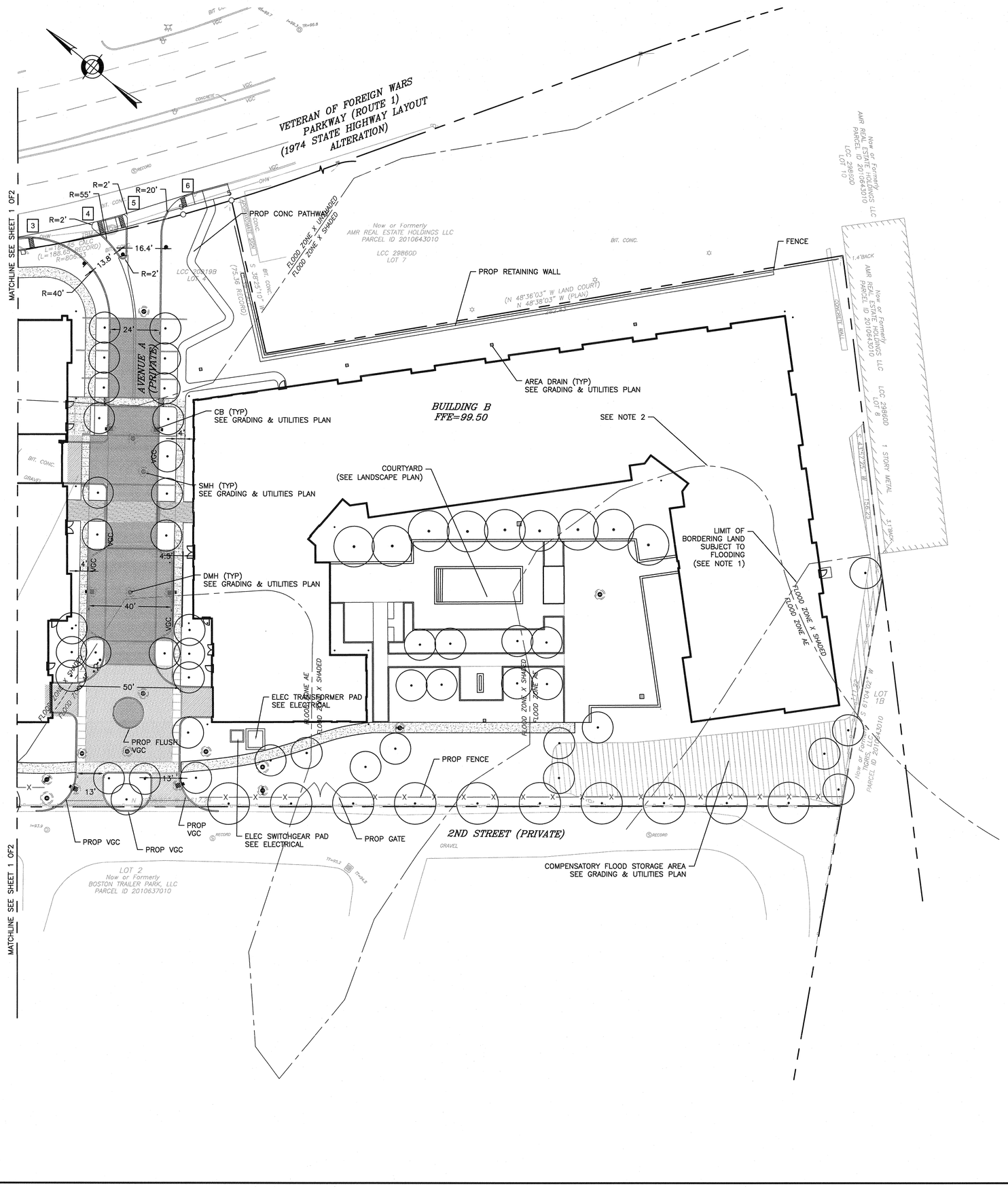
NOI PERMIT SET

LAYOUT & MATERIALS PLAN - 1

DATE:	11/30/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	JEC
CHECKED BY:	RL

C2.00

3/21/2019 L:\17163\Current\CUTSHEET\17163 LAYOUT PLAN.dwg



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WALTHAM, MA 02453

PARKWAY APARTMENTS

1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
1	JC	2/26/19	MASSDOT RESUBMITTAL
2	JC	3/15/19	NOTICE OF INTENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
3/21/19

NOI PERMIT SET

LAYOUT & MATERIALS PLAN - 2

DATE:	11/30/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	JEC
CHECKED BY:	RL

C2.01
SHEET 5 OF 12

NOTES:

1. LIMIT OF BORDERING LAND SUBJECT TO FLOODING (BLSF) DETERMINED BY THE BASE FLOOD ELEVATION PROVIDED ON THE FEMA FLOOD INSURANCE RATE MAP, SUFFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25025C0068G, AND DATED SEPTEMBER 25, 2009 (THE "FIRM"), 90' NAVD 1988 (96.5' BCB), AND FIELD SURVEY.
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20 0 20 40
SCALE IN FEET

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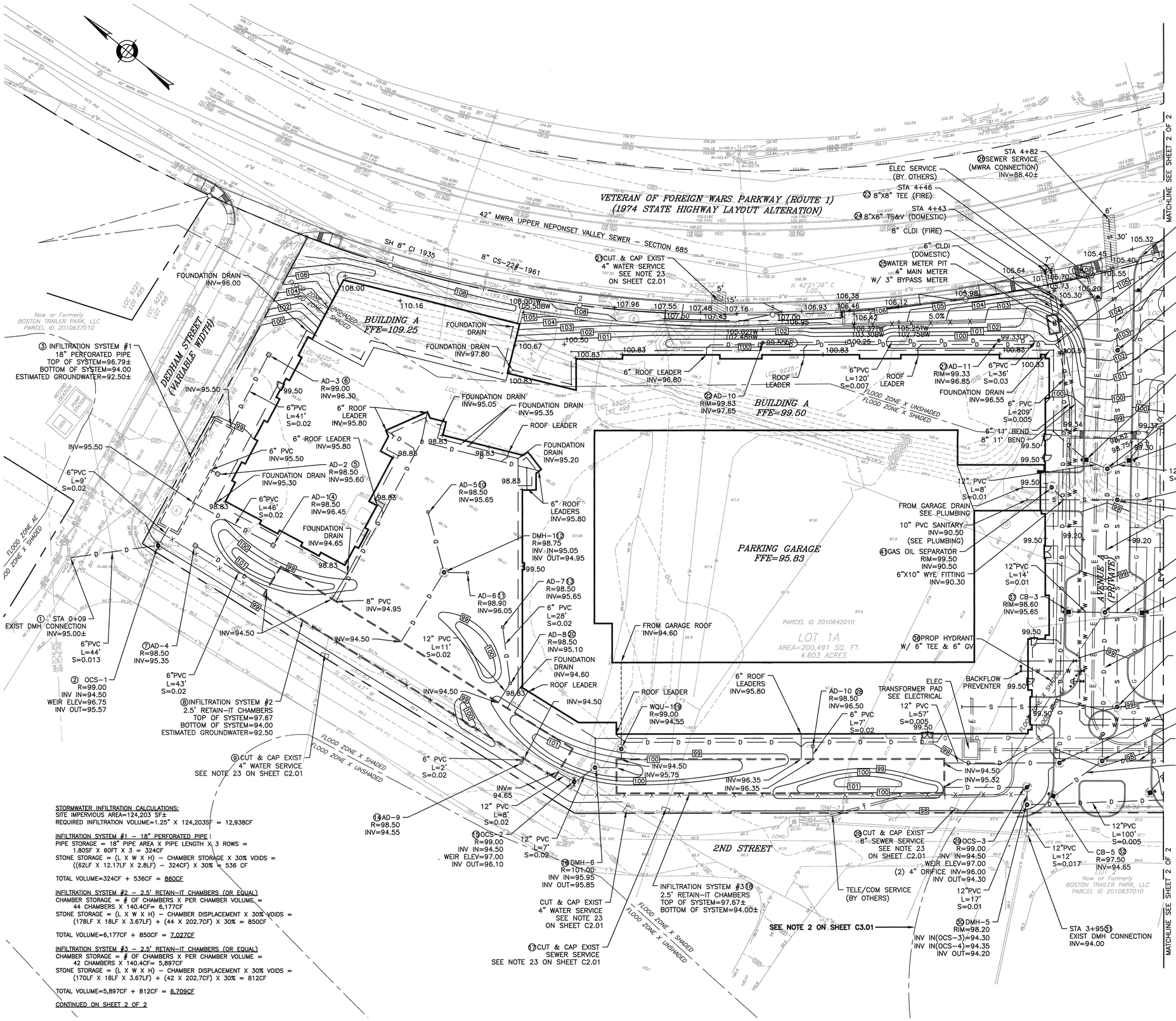

STORMWATER INFILTRATION CALCULATIONS:
SITE IMPERVIOUS AREA=124,203 SF±
REQUIRED INFILTRATION VOLUME=1.25" X 124,203SF = 12,938CF

INFILTRATION SYSTEM #1 – 18" PERFORATED PIPE
PIPE STORAGE = 18" PIPE AREA X PIPE LENGTH X 3 ROWS =
1.80SF X 60FT X 3 = 324CF
STONE STORAGE = (L X W X H) – CHAMBER STORAGE X 30% VOIDS =
((62LF X 12.17LF X 2.8LF) – 324CF) X 30% = 536 CF

TOTAL VOLUME=324CF + 536CF = 860CF

INFILTRATION SYSTEM #2 – 2.5' RETAIN-IT CHAMBERS (OR EQUAL)
CHAMBER STORAGE = # OF CHAMBERS X PER CHAMBER VOLUME =
44 CHAMBERS X 140.4CF= 6,177CF
STONE STORAGE = (L X W X H) – CHAMBER DISPLACEMENT X 30% VOIDS =
(178LF X 18LF X 3.67LF) + (44 X 202.7CF) X 30% = 850CF

TOTAL VOLUME=6,177CF + 850CF = 7,027CF

INFILTRATION SYSTEM #3 – 2.5' RETAIN-IT CHAMBERS (OR EQUAL)
CHAMBER STORAGE = # OF CHAMBERS X PER CHAMBER VOLUME =
42 CHAMBERS X 140.4CF= 5,897CF
STONE STORAGE = (L X W X H) – CHAMBER DISPLACEMENT X 30% VOIDS =
(170LF X 18LF X 3.67LF) + (42 X 202.7CF) X 30% = 812CF

TOTAL VOLUME=5,897CF + 812CF = 6,709CF

CONTINUED ON SHEET 2 OF 2

HOWARD STEIN HUDSON
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PREPARED FOR:
LINCOLN PARKWAY LLC
C/O LINCOLN PROPERTY COMPANY
221 CRESCENT ST, SUITE 102A
WALTHAM, MA 02453

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
1	JC	2/26/19	MASSDOT RESUBMITTAL
2	JC	3/15/19	NOTICE OF INTENT

OWNERS:
LINCOLN PARKWAY, LLC
221 CRESCENT STREET
SUITE 102A
WALTHAM, MA 02453
CONTACT:
ROB TIERNEY
TEL.: (781) 790-8004

PROPERTY ADDRESS:
1545-1555 VFW PARKWAY,
BOSTON (WEST ROXBURY), MASSACHUSETTS 02132
WARD: 20 PARCEL: 2010642010

LAND USE CODE: CC COMMUNITY COMMERCIAL

EXISTING WATER ACCOUNTS:

FOR BWSC USE ONLY

RICHARD E. LATINI
CIVIL
No. 41093
REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
3/21/19

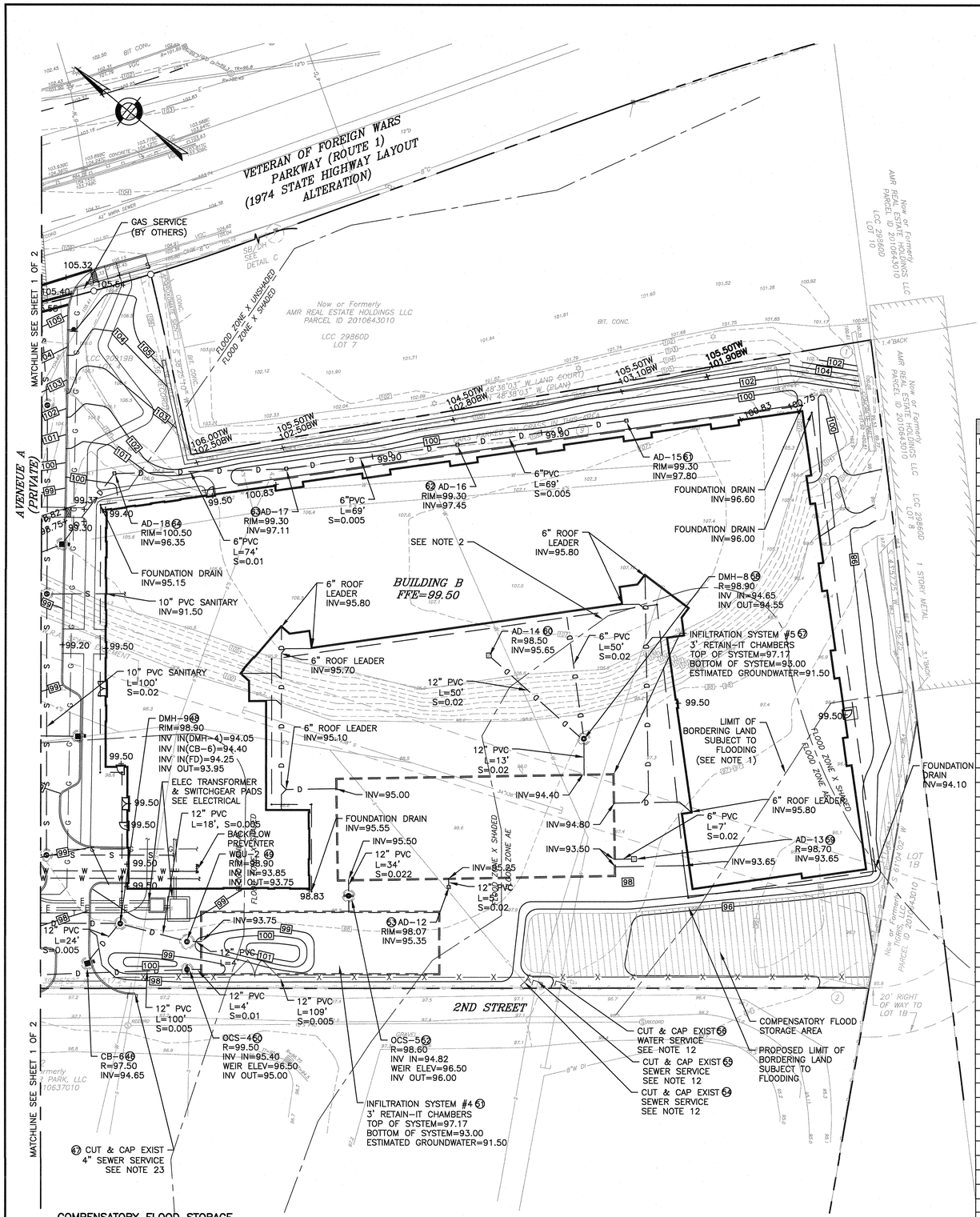
NOI PERMIT SET

GRADING & UTILITIES PLAN - 1

DATE:	11/30/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HV
CHECKED BY:	RL

C3.00
SHEET 6 OF 12

3/27/2019 L:\17163\Current\CUT\SHEET\17163 GRADING AND UTILITIES PLAN.dwg



LEGEND

PROPOSED

CEMENT–LINED DUCTILE IRON PIPE (CLASS 56)	CLDI
DRAIN MANHOLE	
GATE VALVE	
POLYVINYL CHLORIDE PIPE	PVC
OUTLET CONTROL STRUCTURE	OCS
CATCH BASIN	CB
TAPPING SLEEVE & GATE VALVE	TS&V
PROPOSED CONTOUR	
AREA DRAIN	AD

EXISTING

- SEWER MANHOLE
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- MANHOLE
- HYDRANT
- WATER SHUT OFF
- GAS SHUT OFF
- BOSTON WATER VALVE
- CATCH BASIN
- ELECTRIC HANDHOLE
- BOLLARD
- MAIL BOX
- SIGN
- AREA DRAIN
- LIGHT POLE
- UTILITY POLE W/ LIGHT
- GAS METER
- TRASH RECEPTACLE
- DECIDUOUS TREE
- GATE POST
- NUMBER OF PARKING SPACES
- HANDICAP RAMP
- BC — BOTTOM OF CURB
- BIT — BITUMINOUS
- BW — BOTTOM OF WALL
- CLF — CHAIN LINK FENCE
- CONC — CONCRETE
- FGC — FLUSH GRANITE CURB
- Inv — INVERT ELEVATION
- INACC — INACCESSIBLE
- LCC — LAND COURT CASE
- NTS — NOT TO SCALE
- R= — RADIUS OR RIM ELEVATION
- SQ. FT. — SQUARE FEET
- TBM — TEMPORARY BENCH MARK
- TC — TOP OF CURB
- TR= — CENTERLINE OF TROUGH
- TS — TOP OF STEPS
- TT= — TOP OF TRAP
- TW — TOP OF WALL
- VGC — VERTICAL GRANITE CURB
- C — CABLE TELEVISION
- CS — COMBINED SEWER
- D — DRAIN
- E — ELECTRIC
- G — GAS
- T — TELEPHONE
- W — WATER
- S — SEWER

NOTES

1. LIMIT OF BORDERING LAND SUBJECT TO FLOODING (BLSF) DETERMINED BY THE BASE FLOOD ELEVATION PROVIDED ON THE FEMA FLOOD INSURANCE RATE MAP, SUFFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25025C0086G, AND DATED SEPTEMBER 25, 2009 (THE "FIRM"), 90' NAVD 1988 (96.5' BCB), AND FIELD SURVEY.
2. SPECIAL FLOOD HAZARD AREA BASED ON GRAPHIC PLOTTING FROM THE SEPTEMBER 25, 2009 FIRM. HOWEVER, THE BASE FLOOD ELEVATION DETERMINED BY FEMA FOR THIS AREA IN THE FIRM (AND USED IN BLSF DELINEATION, SEE NOTE 1) DOES NOT CORRESPOND TO THIS 2009 FEMA GRAPHIC REPRESENTATION.
3. TOPOGRAPHIC AND PROPERTY LINE INFORMATION OBTAINED FROM A PLAN ENTITLED "ALTA/NSPS LAND TITLE SURVEY, 1515 VETERANS OF FOREIGN WARS PARKWAY, BOSTON (WEST ROXBURY DISTRICT) MASS." PREPARED BY FELDMAN LAND SURVEYORS, DATED JULY 31, 2017 REVISED THROUGH MAY 16, 2018.
4. ALL ELEVATIONS ARE BOSTON CITY BASE (B.C.B).
5. THE ACCURACY AND COMPLETENESS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS ARE NOT GUARANTEED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE EXACT LOCATION, SIZE, TYPE, ETC. OF ALL UNDERGROUND UTILITIES THAT MAY BE AFFECTED BY THE WORK. AT LEAST 72 HOURS BEFORE EXCAVATION BEGINS THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT (888)344–7233.
6. THE CONTRACTOR SHALL FIELD VERIFY CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO ENGINEER.
7. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
8. ALL UTILITY COMPANIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THIS PLAN, (SEE CHAPTER 370, ACTS OF 1963, MASSACHUSETTS) PRIOR TO DESIGNING, EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORATION, OR REPAVING.
9. PROTECT ALL NEW AND EXISTING UTILITIES DURING CONSTRUCTION.
10. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE CONSTRUCTION OF THE PROJECT.
11. ALL WATER, SEWER, AND DRAIN WORK SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS AND STANDARD DETAILS OF THE BOSTON WATER AND SEWER COMMISSION.
12. ALL ABANDONED WATER, SEWER AND DRAIN CONNECTIONS MUST BE CUT AND CAPPED AT THE MAIN IN THE STREET IN ACCORDANCE WITH BWSC STANDARDS. SANITARY SEWER AND STORM DRAIN ABANDONMENT PROCEDURE IS TO CUT AND CAP AT MAIN. RETURN METERS NOT IN USE.
13. PIPE SLOPES ARE IN FEET/FEET.
14. ALL CONSTRUCTION WORK PERFORMED ON THE BWSC'S UTILITY LINES MUST BE INSPECTED BY BWSC CONSTRUCTION INSPECTORS. AS–BUILT PLANS SHALL BE SUBMITTED TO THE BWSC FOLLOWING THE COMPLETION OF THE INSTALLATIONS.
15. CONTRACTOR MUST PAY ALL FEES AND PERMITS.
16. THE CONTRACTOR MUST CLEAN ALL DRAIN INLETS ADJACENT TO THE SITE PRIOR TO PROJECT CLOSEOUT.
17. ANY CONSTRUCTION DEWATERING REQUIRES A DRAINAGE DISCHARGE PERMIT FROM THE BWSC AND A NPDES PERMIT FROM THE EPA.
18. RIM ELEVATIONS OF ALL STRUCTURES ARE APPROXIMATE AND SHALL BE FLUSH TO FINISH GRADE. THIS INCLUDES ADJUSTING THE RIM ELEVATIONS OF EXISTING MANHOLES, GATES, ETC. FINAL ELEVATIONS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD.
19. BWSC OPERATIONS (617–989–7276) MUST BE NOTIFIED 48 HOURS IN ADVANCE PRIOR TO THE INSTALLATION OF WATER AND FIRE SERVICES AND, IF NEEDED, SHUTTING DOWN OF THE MAIN.
20. THE CONTRACTOR SHALL PREPARE AS–BUILT PLAN (MYLAR & ELECTRONICALLY) OF THE UTILITY SYSTEM WORK FOR SUBMITTAL TO THE BOSTON WATER AND SEWER COMMISSION, AND IS INCIDENTAL TO THE WORK.
21. A PREREQUISITE FOR FILING A GENERAL SERVICE APPLICATION WITH THE BOSTON WATER AND SEWER COMMISSION FOR NEW CONSTRUCTION IS THE ROUGH CONSTRUCTION SIGN–OFF DOCUMENT FROM THE CITY OF BOSTON'S INSPECTIONAL SERVICES DEPARTMENT.
22. IF WATER USE FROM HYDRANT IS PROPOSED THE CONTRACTOR MUST APPLY FOR A HYDRANT METER PERMIT FROM THE BWSC AND PAY ALL COSTS INCLUDING DEPOSIT, RENTAL, AND WATER USAGE FEES.
23. METERS 2–INCHES OR LESS WILL BE SUPPLIED BY BWSC.
24. PIPE MATERIALS (UNLESS OTHERWISE NOTED)
    STORM DRAIN: PVC SDR 35
    SANITARY SEWER: PVC SDR 35
    WATER PIPE: CLDI CLASS 56 W/ ZINC COATING

BWSC INSPECTION SIGN–OFF SCHEDULE

ITEM NO.	DESCRIPTION OF SERVICE	BWSC INSPECTOR/DATE	COMMENT
1	EXISTING DMH CONNECTION		
2	OCS–1		
3	INFILTRATION SYSTEM #1		
4	AD–1		
5	AD–2		
6	AD–3		
7	AD–4		
8	INFILTRATION SYSTEM #2		
9	CUT & CAP EXIST WATER SERVICE		
10	AD–5		
11	AD–6		
12	DMH–1		
13	AD–7		
14	AD–9		
15	OCS–2		
16	DMH–6		
17	CUT & CAP EXIST SEWER SERVICE		
18	INFILTRATION SYSTEM #3		
19	WQU–1		
20	AD–8		
21	CUT & CAP EXIST WATER SERVICE		
22	AD–10		
23	8"X8" TEE (FIRE)		
24	8"X6" TS&V (DOMESTIC)		
25	WATER METER PIT		
26	SEWER SERVICE		
27	AD–11		
28	CUT & CAP EXIST SEWER SERVICE		
29	OCS–3		
30	DMH–5		
31	EXIST DMH CONNECTION		
32	CB–5		
33	DMH–4		
34	DMH–7		
35	SMH–1		
36	PROP HYDRANT		
37	CB–3		
38	DMH–3		
39	CB–4		
40	SMH–2		
41	GAS OIL SEPARATOR		
42	CB–1 W/ CASCADE GRATE		
43	DMH–2		
44	CB–2 W/ CASCADE GRATE		
45	SMH–3		
46	CB–6		
47	CUT & CAP EXIST SEWER SERVICE		
48	DMH–9		
49	WQU–2		
50	OCS–4		
51	INFILTRATION SYSTEM #4		
52	OSC–5		
53	AD–12		
54	CUT & CAP EXIST SEWER SERVICE		
55	CUT & CAP EXIST SEWER SERVICE		
56	CUT & CAP EXIST WATER SERVICE		
57	INFILTRATION SYSTEM #5		
58	DMH–8		
59	AD–13		
60	AD–14		
61	AD–15		
62	AD–16		
63	AD–17		
64	AD–18		
	"DO NOT DUMP" PLAQUE (6)		
65	AS–BUILT		
66	4:1 I/I		

COMPENSATORY FLOOD STORAGE

Existing Flood Storage Within Proposed Limit of Work

Contour Elevation	Area (SF)	Average Area (SF)	Depth (FT)	Volume (CF)
96.50	7905			
		4482.5	0.5	2241.25
96.00	1060			
		532.5	0.20	106.5
95.80	5			
			Total Volume =	2347.75

Proposed Flood Storage Within Proposed Limit of Work

Contour Elevation	Area (SF)	Average Area (SF)	Depth (FT)	Volume (CF)
96.50	5111			
		4041	0.5	2020.5
96.00	2971			
		1735.5	0.20	347.1
95.80	500			
			Total Volume =	2367.6

STORMWATER INFILTRATION CALCULATIONS (CONT'D):

INFILTRATION SYSTEM #4 – 3' RETAIN–IT CHAMBERS (OR EQUAL)
CHAMBER STORAGE = # OF CHAMBERS X PER CHAMBER VOLUME =
36 CHAMBERS X 170.6CF = 6,142CF
STONE STORAGE = (L X W X H) – CHAMBER DISPLACEMENT X 30% VOIDS =
(98LF X 26LF X 4.17LF) – (36 X 234.7CF) X 30% = 652CF

TOTAL VOLUME = 6,142CF + 650CF = 6,792CF

INFILTRATION SYSTEM #5 – 3' RETAIN–IT CHAMBERS (OR EQUAL)
CHAMBER STORAGE = # OF CHAMBERS X PER CHAMBER VOLUME =
70 CHAMBERS X 170.6CF = 11,942CF
STONE STORAGE = (L X W X H) – CHAMBER DISPLACEMENT X 30% VOIDS =
(114LF X 42LF X 4.17LF) – (70 X 234.7CF) X 30% = 1,061CF

TOTAL VOLUME = 5,054CF + 1,061CF = 5,704CF

33,911CF PROPOSED > 12,938CF REQUIRED

SEWER GENERATION FLOW ESTIMATE			
USE	QUANTITY	DESIGN FLOWS	ESTIMATED DAILY FLOW (GPD)
RESIDENTIAL	335 BEDROOMS	110 GPD/BEDROOM	36,850
PROPOSED TOTAL			36,850 GPD

20 0 20 40
SCALE IN FEET

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PREPARED FOR:
LINCOLN PARKWAY LLC
C/O LINCOLN PROPERTY COMPANY
221 CRESCENT ST, SUITE 102A
WALTHAM, MA 02453

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
1	JC	2/26/19	MASSDOT RESUBMITTAL
2	JC	3/15/19	NOTICE OF INTENT

RICHARD E. LATINI CIVIL No. 41035 REGISTERED PROFESSIONAL ENGINEER
3/21/19

NOI PERMIT SET

GRADING & UTILITIES PLAN - 2

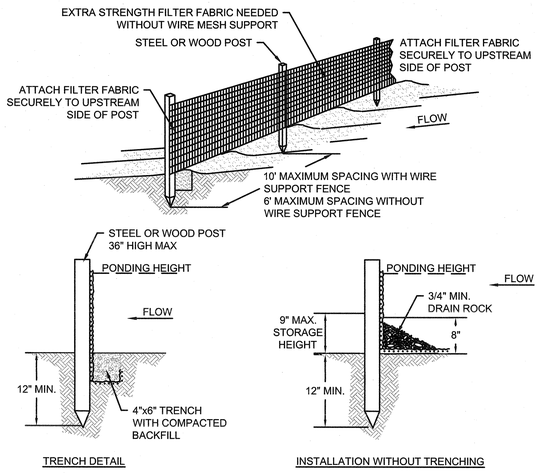
DATE:	11/30/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JC
DRAWN BY:	HV
CHECKED BY:	RL

C3.01
SHEET 7 OF 12

3/21/2019 L:\17163\Current\CUTSHEET\17163 GRADING AND UTILITIES PLAN.dwg

EROSION & SEDIMENT CONTROL NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED AND UPGRADED AS NECESSARY DURING CONSTRUCTION BY THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND INSTALL ADDITIONAL CONTROL MEASURES AS NEEDED DURING CONSTRUCTION.
2. ALL CATCH BASINS RECEIVING DRAINAGE FROM THE PROJECT SITE MUST BE PROVIDED WITH A CATCH BASIN FILTER.
3. STABILIZATION OF ALL RE-GRADED AND SOIL STOCKPILE AREAS MUST BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
4. SEDIMENT REMOVED FROM EROSION AND SEDIMENT CONTROL DEVICES MUST BE PROPERLY REMOVED AND DISPOSED. ALL DAMAGED CONTROLS MUST BE REMOVED AND REPLACED.
5. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THE EROSION AND SEDIMENT CONTROL PLAN. THIS INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER CITY AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING WIND EROSION AND DUST THROUGHOUT THE LIFE OF HIS CONTRACT. DUST CONTROL MAY INCLUDE, BUT IS NOT LIMITED TO, SPRINKLING OF WATER ON EXPOSED SOILS AND STREET SWEEPING ADJACENT ROADWAYS.
7. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN 21 DAYS AFTER LAND DISTURBANCE ACTIVITIES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZED SOILS WITHIN 14 DAYS OF THE LAST DISTURBANCE.
8. IF A DISTURBED AREA WILL BE EXPOSED FOR GREATER THAN ONE YEAR, PERMANENT GRASSES OR OTHER APPROVED COVER MUST BE INSTALLED.
9. THE CONTRACTOR MUST KEEP ON-SITE AT ALL TIMES ADDITIONAL FILTER BERMS AND/OR SILT FENCE FOR THE INSTALLATION AT THE DIRECTION OF THE ENGINEER OR CONSERVATION COMMISSION TO MITIGATE ANY EMERGENCY CONDITION.
10. THE CONSTRUCTION FENCING AND EROSION AND SEDIMENT CONTROLS AS SHOWN MAY NOT BE PRACTICAL DURING ALL STAGES OF CONSTRUCTION. EARTHWORK ACTIVITY ON-SITE MUST BE DONE IN A MANNER SUCH THAT RUNOFF IS DIRECTED TO A SEDIMENT CONTROL DEVICE OR INFILTRATED TO THE GROUND.
11. DEMOLITION AND CONSTRUCTION DEBRIS MUST BE PROPERLY CONTAINED AND DISPOSED OF.
12. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE HAULED OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
13. CONSTRUCTION VEHICLES MUST ACCESS THE SITE FROM HAUL ROAD DURING CONSTRUCTION.



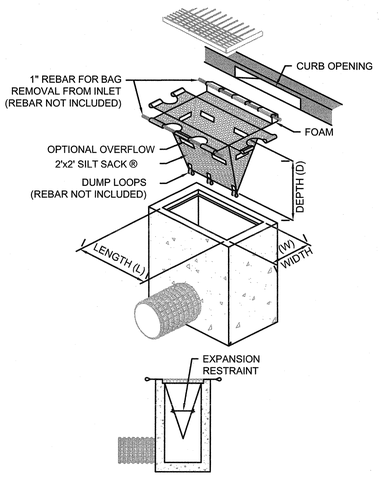
TRENCH DETAIL

INSTALLATION WITHOUT TRENCHING

NOTES:

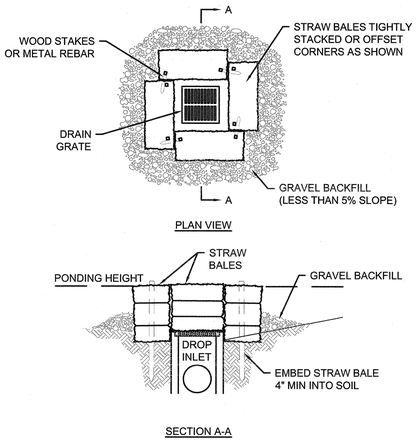
1. EROSION CONTROL BARRIER (HAY BALES, SILT FENCE OR EROSION STOCK) SHALL BE PLACED AROUND ALL MATERIAL STOCKPILE AREAS AND MAINTAINED AT STAGING AREAS TO ASSURE NO SILTATION ONTO PUBLIC OR PRIVATE WAYS OR PROPERTY.

EROSION CONTROL BARRIER
NOT TO SCALE



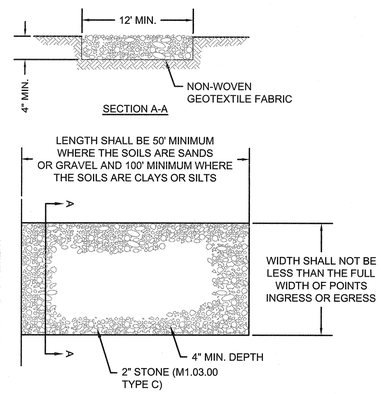
SIDE VIEW INSTALLED

CATCH BASIN FILTER



STRAW BALE & GRAVEL INLET SEDIMENT BARRIER

TEMPORARY INLET PROTECTION
NOT TO SCALE

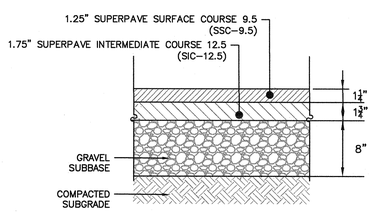


PLAN

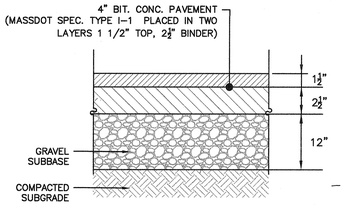
NOTES:

1. INSTALLATION: THE AREA OF THE ENTRANCE SHOULD BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. THE GRAVEL SHALL BE PLACED TO THE SPECIFIED DIMENSIONS NOTED ABOVE.
2. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENTS ONTO PUBLIC RIGHT-OF-WAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE, OR ADDITIONAL LENGTH, AS CONDITIONS DEMAND, AND REPAIR, AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.
3. LOCATION: SEE C1.0 FOR LOCATION OF CONSTRUCTION ENTRANCES.

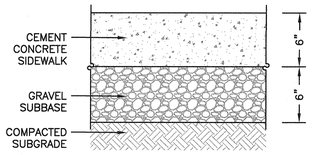
ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE



HOT MIX ASPHALT SIDEWALK
NOT TO SCALE



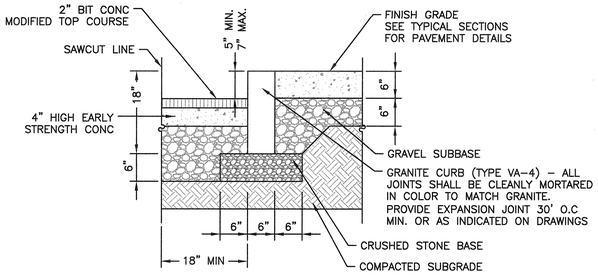
FULL DEPTH ROADWAY SECTION DETAIL
NOT TO SCALE



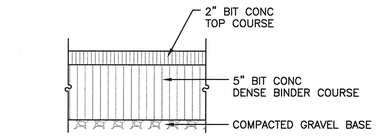
NOTES:

1. CONCRETE SIDEWALK DETAIL AND NOTES APPLY TO SIDEWALK WITHIN THE RIGHT-OF-WAY.
2. CONCRETE SHALL BE 4,000 PSI.
3. SIDEWALKS ARE TO BE RAKED FINISH WITH 3/8 INCH TROWEL JOINTS.

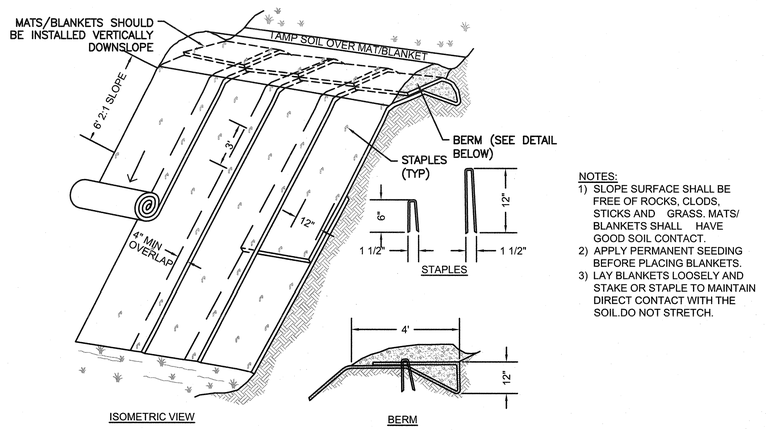
CEM CONC SIDEWALK SECTION DETAIL
NOT TO SCALE



VERTICAL GRANITE CURB AT STREET
NOT TO SCALE



TRENCH PATCH DETAIL
NOT TO SCALE



NOTES:
1) SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2) APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3) LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL.DO NOT STRETCH.

EROSION BLANKETS AND TURF REINFORCEMENT MATS SLOPE INSTALLATION
NOT TO SCALE

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C/O LINCOLN PROPERTY COMPANY
221 CRESCENT ST, SUITE 102A
WALTHAM, MA 02453

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
3/15/19

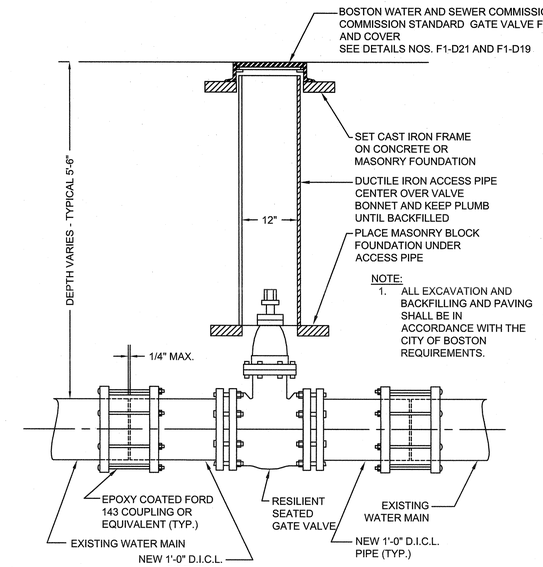
NOI PERMIT SET

SITE DETAILS - 1

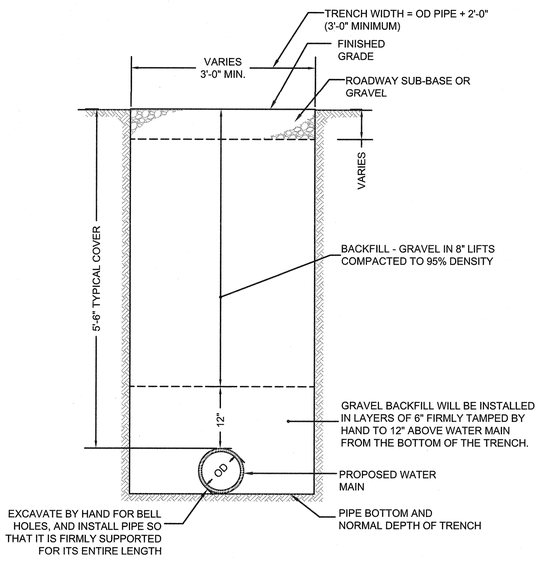
DATE:	12/18/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HKV
CHECKED BY:	RL

C4.00

3/21/2019 L:\17163\Civil\CUT\SHEET\17163 SITE DETAILS.dwg



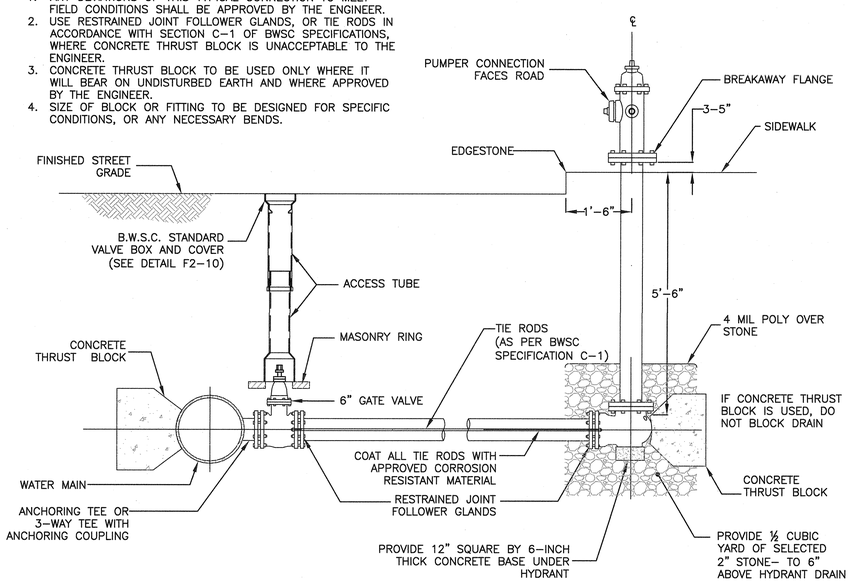
TYPICAL GATE VALVE INSTALLATION (A–20)
NOT TO SCALE



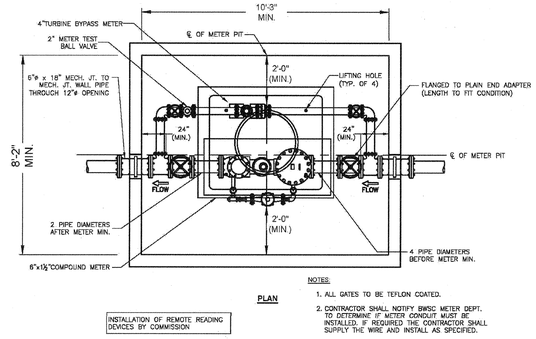
TRENCH DETAIL – WATER MAIN (A–05)
NOT TO SCALE

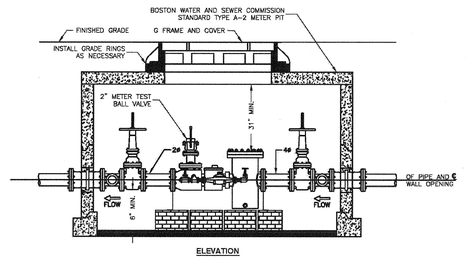
NOTES:

1. ANY DEVIATIONS OF THIS TYPICAL CONNECTION TO MEET FIELD CONDITIONS SHALL BE APPROVED BY THE ENGINEER.
2. USE RESTRAINED JOINT FOLLOWER GLANDS, OR TIE RODS IN ACCORDANCE WITH SECTION C–1 OF BWSC SPECIFICATIONS, WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE TO THE ENGINEER.
3. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH AND WHERE APPROVED BY THE ENGINEER.
4. SIZE OF BLOCK OR FITTING TO BE DESIGNED FOR SPECIFIC CONDITIONS, OR ANY NECESSARY BENDS.

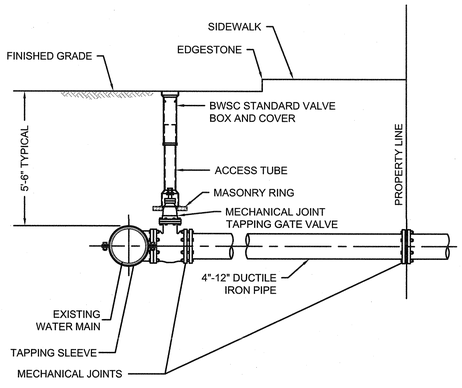


FIRE HYDRANT CONNECTION
NOT TO SCALE





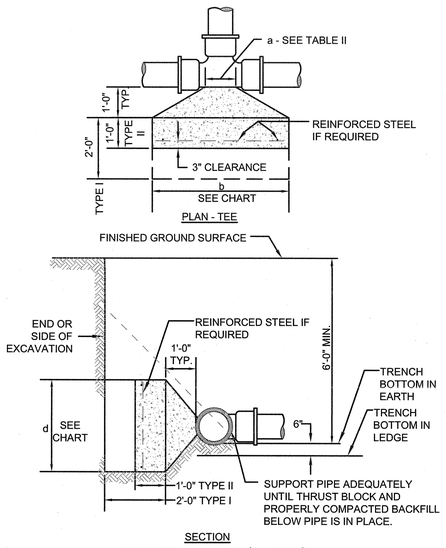
WATER METER PIT DETAIL
NOT TO SCALE



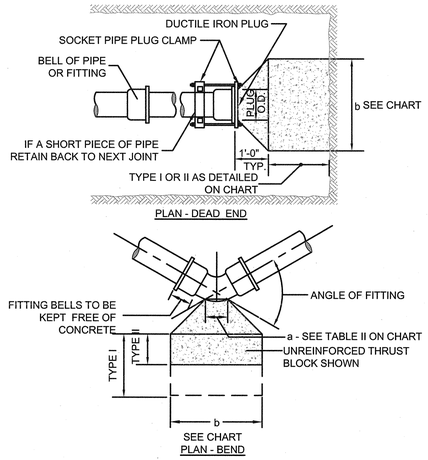
NOTES:

1. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.
2. USE RESTRAINED JOINT FITTINGS OR TIE RODS WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE.
3. SIZE OF BLOCK OR MEGALUG TO BE DESIGNED FOR SPECIFIC CONDITIONS.

TAPPING SLEEVE & VALVE (A–09)
NOT TO SCALE



THRUST BLOCK (A–01b)
NOT TO SCALE



THRUST BLOCK (A–01a)
NOT TO SCALE

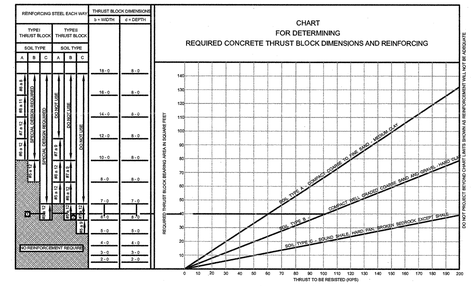
TABLE II - "a" DIMENSION - FEET

PIPE DIAMETER - INCHES	90° FITTING	22½° & 45° FITTINGS
6, 8, 10 & 12	1–6	1–0
16 & 20	2–6	1–6
24"–30"	3–0	2–0

TABLE I - THRUST - KIPS (WATER PRESSURE = 200 P.S.I.)

PIPE DIAMETER INCHES		6	8	10	12	16	20	24	30	36	42
DEAD ENDS AND TEES		6.6	10	15.8	22.6	40.2	62.8	90.4	141.0	203.6	277.0
BEND ANGLE AND FITTING	90°	7.9	14.2	22.4	32.0	56.6	88.8	127.7	199.0	286.0	392.0
	45°&22½°	-	11.1	17.6	25.1	44.7	70.0	100.2	157.0	226.0	308.0
	30 1/4°	-	-	14.9	21.2	37.9	59.2	85.1	133.0	192.0	261.0
	22½°	-	-	-	17.3	30.8	48.1	69.0	108.0	156.0	212.0
	11 3/4°	-	-	-	13.1	23.3	36.6	52.6	82.0	118.0	161.0
	11 1/2°	-	-	-	8.8	15.7	24.5	35.3	55.0	79.5	108.0

DESIGN THRUST BLOCKS OR OTHER SUITABLE ANCHORAGE TO SUIT ACTUAL CONDITIONS



THRUST BLOCK DIMENSIONS (A–01c)
NOT TO SCALE

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PREPARED FOR:

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PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
3/21/19

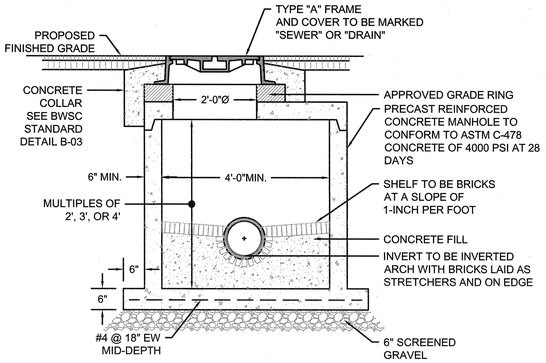
NOI PERMIT SET

SITE DETAILS - 2

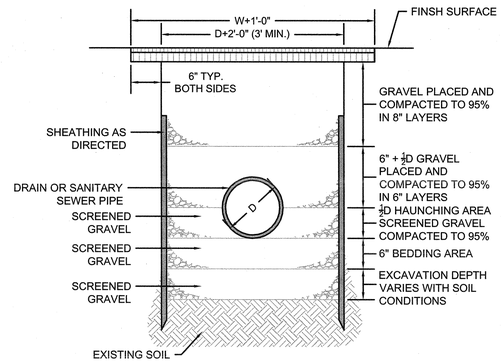
DATE:	12/18/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HKV
CHECKED BY:	RL

C4.01
SHEET 9 OF 12

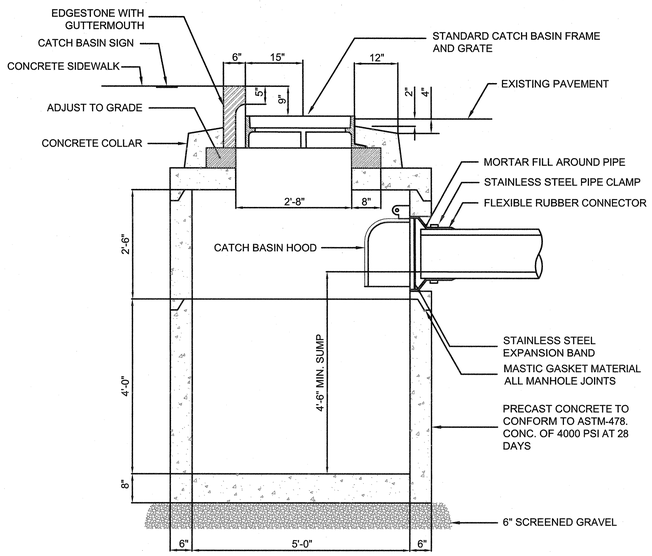
3/21/2019 L:\17163\Current\CUTSHEET\17163 SITE DETAILS.dwg



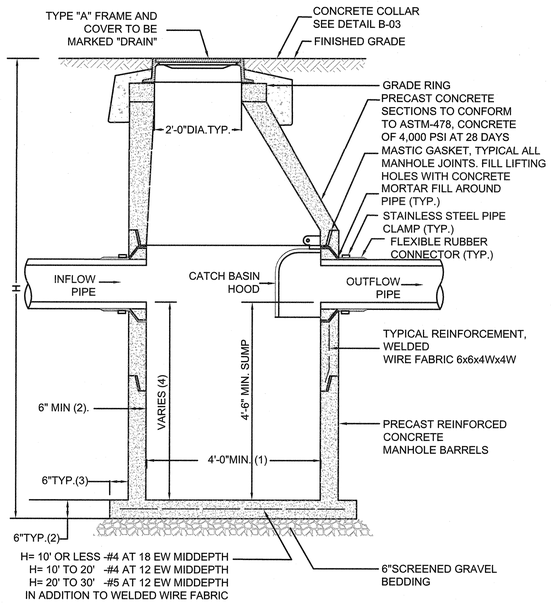
SHALLOW MANHOLE (B–06)
NOT TO SCALE



TRENCH DETAIL – DRAIN & SANITARY SEWER (B–08)
NOT TO SCALE

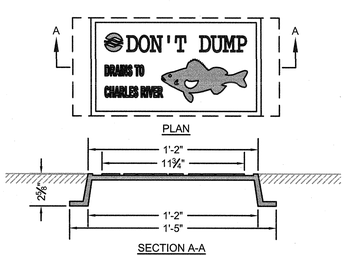


SHALLOW CATCH BASIN
NOT TO SCALE



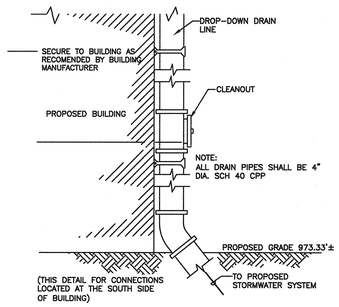
NOTES:
1. 5'-0" DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET OR WHEN ORDERED BY THE ENGINEER.
2. 6 INCH MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES.
3. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED. CONCRETE INVERT AND SHELF MAY BE SUBSTITUTED IN STORM DRAIN MANHOLES AS DIRECTED BY THE ENGINEER.
4. IN SOME INSTALLATIONS, THE INFLOW PIPE WILL BE LOWER THAN THE OUTFLOW PIPE, AND THE SUMP DEPTH WILL BE GREATER THAN 4'-6" TO MAINTAIN A MINIMUM DISTANCE OF 2'-6" FROM THE INVERT OF THE INFLOW PIPE TO THE BOTTOM OF THE SUMP.

PRECAST CONCRETE DRAIN SUMP MANHOLE (B–07)
NOT TO SCALE

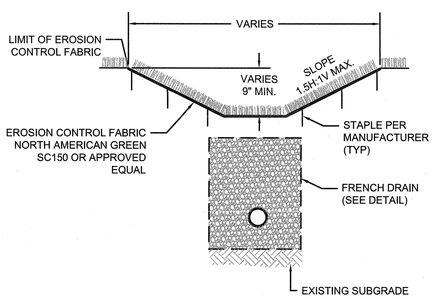


NOTE:
CATCH BASIN SIGNS TO BE PROVIDED BY THE BOSTON WATER AND SEWER COMMISSION (BWSC).

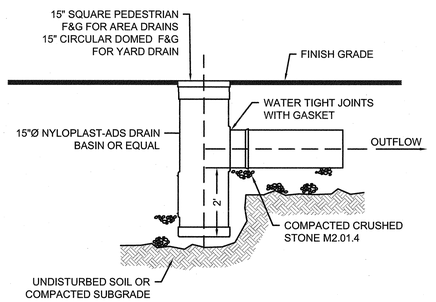
8" X 14" CATCH BASIN SIGN (F1–D23)
NOT TO SCALE



ROOF DRAIN LINE AND DROP–DOWN LEADER JUNCTION DETAIL
NOT TO SCALE

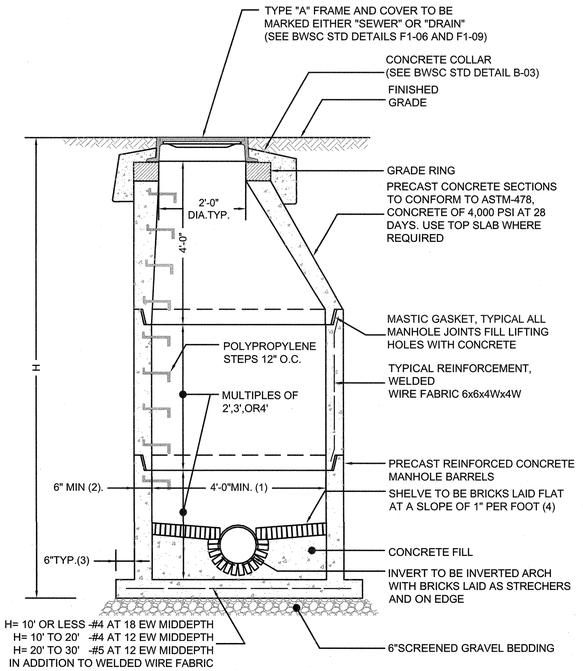


VEGETATED SWALE
NOT TO SCALE



NOTE: STRUCTURE MUST BE ADEQUATE FOR H-10 MIN. LOADING

AREA DRAIN
NOT TO SCALE



NOTES:
1. 5'-0" DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET OR WHEN ORDERED BY THE ENGINEER.
2. 6 INCH MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES.
3. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED. CONCRETE INVERT AND SHELF MAY BE SUBSTITUTED IN STORM DRAIN MANHOLES AS DIRECTED BY THE ENGINEER.

PRECAST CONCRETE MANHOLE (B–02a)
NOT TO SCALE

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WALTHAM, MA 02453

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

RICHARD E. LATINI CIVIL No. 41033 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS
3/21/19

NOI PERMIT SET

SITE DETAILS - 3

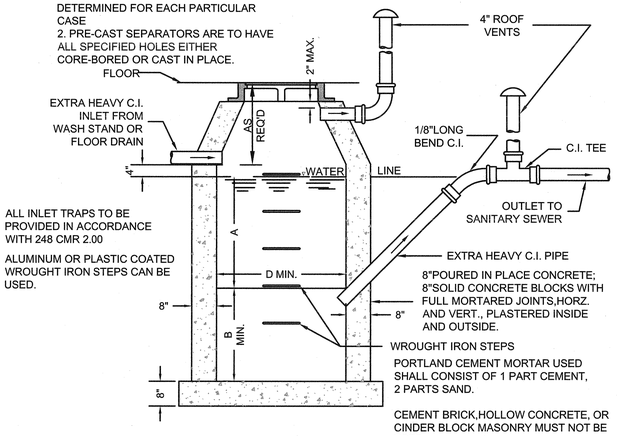
DATE:	12/18/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HKV
CHECKED BY:	RL

C4.02
SHEET 10 OF 12

3/21/2019 L:\17163\Cadd\SUTSHEET\17163 SITE DETAILS.dwg

INLET	D	A	B	INLET	D	A	B
4"	3'-6"Ø	3'-0"	2'-6"	8"	5'-0"Ø	6'-0"	5'-0"
5"	3'-6"Ø	5'-0"	4'-0"		5'-6"x 5'-6"	4'-6"	4'-0"
	3'-6"x 3'-6"	4'-0"	3'-0"		6'-0"Ø	4'-0"	3'-6"
	4'-0"	3'-8"	3'-0"		6'-0"x 6'-0"	3'-0"	2'-6"
	4'-0"x 4'-0"	3'-0"	2'-6"		6'-6"Ø	3'-6"	3'-0"
	4'-6"	3'-0"	2'-6"		6'-6"x 6'-6"	3'-0"	2'-6"
6"	4'-0"Ø	5'-0"	4'-6"	10"	5'-6"Ø	7'-6"	6'-6"
	4'-0"x 4'-0"	4'-0"	3'-6"		6'-0"x 6'-0"	5'-6"	4'-6"
	4'-6"Ø	4'-0"	3'-6"				
	4'-6"x 4'-6"	3'-6"	3'-0"		6'-0"Ø	6'-6"	5'-6"
	5'-0"Ø	3'-6"	3'-0"		6'-6"x 6'-6"	5'-0"	4'-0"
	5'-0"x 5'-0"	3'-0"	2'-6"				

NOTES:
1. FOR INLETS LARGER THAN 10" THE DESIGN AND DIMENSIONS WILL BE DETERMINED FOR EACH PARTICULAR CASE
2. PRE-CAST SEPARATORS ARE TO HAVE ALL SPECIFIED HOLES EITHER CORE-BORED OR CAST IN PLACE.



ALL INLET TRAPS TO BE PROVIDED IN ACCORDANCE WITH 248 CMR 2.00

ALUMINUM OR PLASTIC COATED WROUGHT IRON STEPS CAN BE USED.

PORTLAND CEMENT MORTAR USED SHALL CONSIST OF 1 PART CEMENT, 2 PARTS SAND.

CEMENT BRICK,HOLLOW CONCRETE, OR CINDER BLOCK MASONRY MUST NOT BE USED.

GENERAL CONSTRUCTION NOTES

BASIN TO BE LOCATED OUTSIDE OF BUILDING WHERE POSSIBLE,COVER TO HAVE A CENTER HOLE.

A TIGHT COVER MUST BE USED IF BASIN IS LOCATED INSIDE OF BUILDING.

OPENING SHALL BE NOT LESS THAN 24" DIA.

THE CATCH BASIN SHALL BE SO LOCATED AND CONSTRUCTED THAT SURFACE WATER SHALL BE EXCLUDED.

INLET PIPE SHALL BE AT LEAST FOUR INCHES ABOVE NORMAL WATER LINE.

WHERE SUBJECT TO FROST OR CRUSHING CONDITIONS, OUTLET SHALL BE AT LEAST THREE FEET BELOW THE SURFACE.

THE NEW CATCH BASIN MUST BE FILLED WITH CLEAN WATER BEFORE USING, AND AFTER BEING EMPTIED FOR PERIODIC CLEANING.
ALL OIL AND GASOLINE MUST BE REMOVED BEFORE CLEANING OUT THE BASIN, AND MUST NOT BE DISCHARGED INTO THE SEWER THROUGH OTHER FIXTURES.

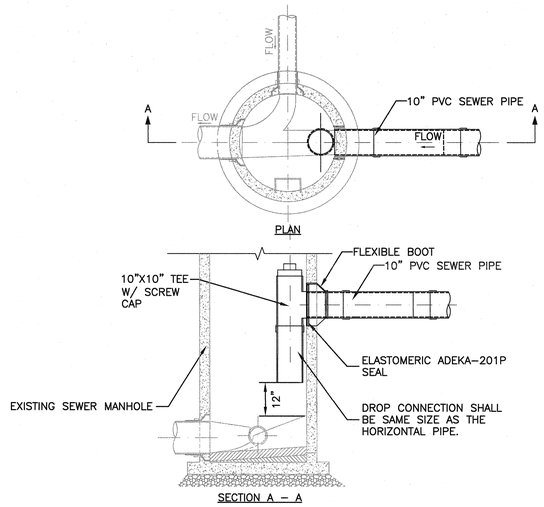
SPECIFICATIONS FOR COVERING SPECIAL CASES OR CONDITIONS, SHALL BE APPROVED BY THE LOCAL AUTHORITIES, AND THE AUTHORITIES OF THE M.W.R.A.

WROUGHT IRON STEPS SHALL BE SPACED ABOUT 18" APART.

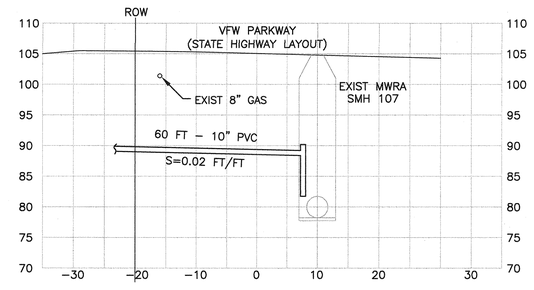
BOTH VENTS SHALL BE EXTENDED INDEPENDENTLY 18" ABOVE THE ROOF, OR AS APPROVED BY THE LOCAL AUTHORITIES, AND THE AUTHORITIES OF THE M.W.R.A.

OUTLET PIPE TO BE 45 DEGREE ANGLE.

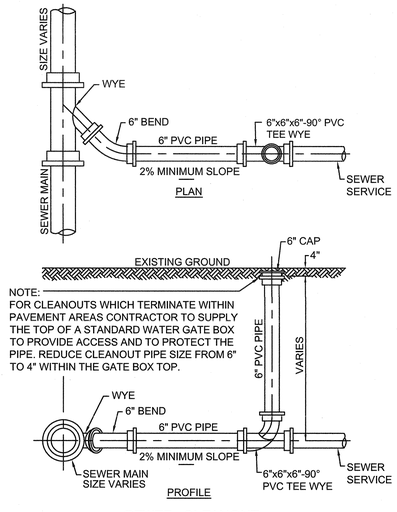
APPROVED OIL AND GREASE SEPARATOR (G-01)
NOT TO SCALE



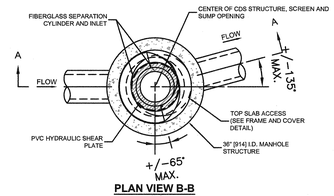
MWRA SEWER MANHOLE CONNECTION
DROP MANHOLE CONNECTION
NOT TO SCALE



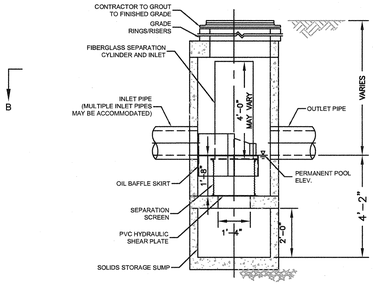
SEWER PROFILE
SCALE: 1"=5'



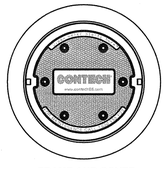
SEWER CLEANOUT
NOT TO SCALE



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO **HS20** LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO **M306** AND BE CAST WITH THE CONTECH LOGO..
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

WATER QUALITY UNIT - CDS1515-3-C
NOT TO SCALE

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PREPARED FOR:

LINCOLN PARKWAY LLC
C/O LINCOLN PROPERTY COMPANY
221 CRESCENT ST, SUITE 102A
WALTHAM, MA 02453

PARKWAY APARTMENTS
1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41088
3/15/19

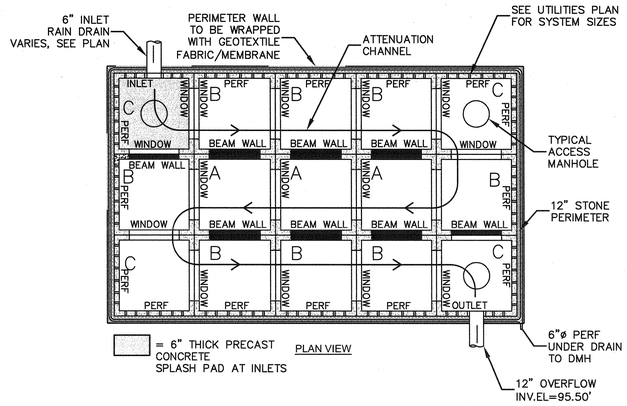
NOI PERMIT SET

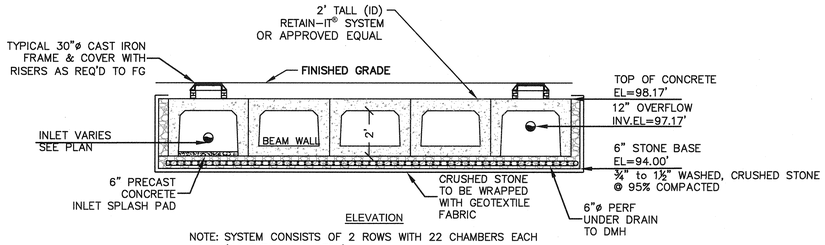
SITE DETAILS - 4

DATE:	12/18/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HKV
CHECKED BY:	RL

C4.03
SHEET 11 OF 12

3/21/2019 L:\17163\Current\CIVIL\SHEET\17163 SITE DETAILS.dwg

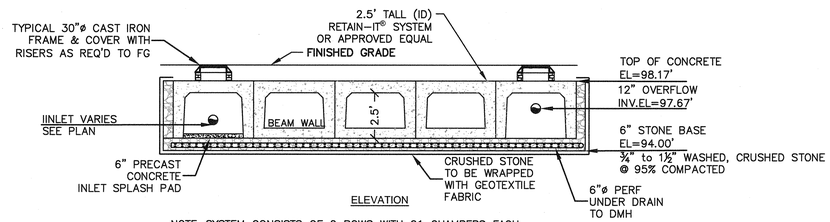




NOTE: SYSTEM CONSISTS OF 2 ROWS WITH 22 CHAMBERS EACH
(44 TOTAL CHAMBERS)

SUBSURFACE INFILTRATION SYSTEM #2

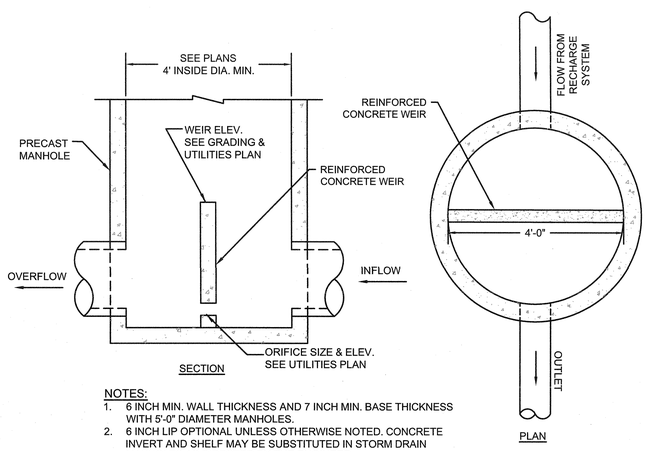
NOT TO SCALE



NOTE: SYSTEM CONSISTS OF 2 ROWS WITH 21 CHAMBERS EACH
(42 TOTAL CHAMBERS)

SUBSURFACE INFILTRATION SYSTEMS #3

NOT TO SCALE

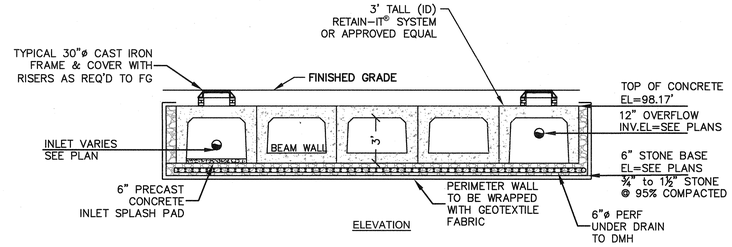


NOTES:

1. 6 INCH MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES.
2. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED. CONCRETE INVERT AND SHELF MAY BE SUBSTITUTED IN STORM DRAIN MANHOLES AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR TO SUBMIT METHOD OF BRACING WEIR.

OUTLET CONTROL STRUCTURE

NOT TO SCALE



NOTES:

1. SYSTEM #4 CONSISTS OF 3 ROWS WITH 12 CHAMBERS EACH (36 TOTAL CHAMBERS)
2. SYSTEM #5 CONSISTS OF 5 ROWS WITH 14 CHAMBER EACH (70 TOTAL CHAMBERS)

SUBSURFACE INFILTRATION SYSTEM #4 & #5

NOT TO SCALE

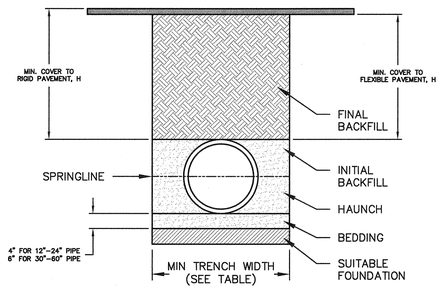


TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"

TABLE 2, MINIMUM RECOMMENDED COVER BASED ON VEHICLE LOADING CONDITIONS

	SURFACE LIVE LOADING CONDITION	
PIPE DIAM.	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12" – 48"	12"	48"
60"	24"	60"

* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS". LATEST ADDITION, WITH THE EXCEPTION THAT THE INITIAL BACKFILL MAY EXTEND TO THE CROWN OF THE PIPE. SOIL CLASSIFICATIONS ARE PER THE LATEST VERSION OF ASTM D2321. CLASS IVB MATERIALS (MH, CH) AS DEFINED IN PREVIOUS VERSIONS OF ASTM D2321 ARE NOT APPROPRIATE BACKFILL MATERIALS.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II, III, OR IV. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 12"-24" (300mm-600mm) DIAMETER PIPE; 6" (150mm) FOR 30"-60" (750mm-1500mm) DIAMETER PIPE. THE MIDDLE 1/3 BENEATH THE PIPE INVERT SHALL BE LOOSELY PLACED. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF A SOIL EXPERT.
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II, III, OR IV IN THE PIPE ZONE EXTENDING TO THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF A SOIL EXPERT.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" (300mm) FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS; CLASS I OR II MATERIAL COMPACTED TO 90% SPD AND CLASS III COMPACTED TO 95% SPD IS REQUIRED. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" (300mm) UP TO 48" (1200mm) DIAMETER PIPE AND 24" (600mm) OF COVER FOR 60" (1500mm) DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.
7. FOR ADDITIONAL INFORMATION SEE TECHNICAL NOTE 2.04.

INFILTRATION SYSTEM #1
18" PERFORATED PIPES

NOT TO SCALE

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WALTHAM, MA 02453

PARKWAY APARTMENTS

1545-1555 VFW PARKWAY
WEST ROXBURY, BOSTON, MA, 02132
SUFFOLK COUNTY

REVISIONS:

NO	BY	DATE	DESCRIPTION
		3/15/19	NOTICE OF INTENT

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
3/21/19

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SITE DETAILS - 5

DATE:	12/18/2018
PROJECT NUMBER:	17163.01
DESIGNED BY:	JEC
DRAWN BY:	HKV
CHECKED BY:	RL

C4.04

3/21/2019 L:\17163\Current\CIVIL\SHEET\17163 SITE DETAILS.dwg

HOWARD STEIN HUDSON
Engineers + Planners

STORMWATER MANAGEMENT REPORT

Parkway Apartments

1545-1555 VFW Parkway
Boston, Massachusetts

Prepared for

Lincoln Parkway LLC c/o Lincoln Property Company
221 Crescent Street, Suite 102A
Waltham, MA 02453

Prepared by

Howard Stein Hudson
11 Beacon Street, Suite 1010
Boston, MA 02108
617-482-7080

March 18, 2019

Table of Contents

List of Tables

Appendices

Introduction

This Stormwater Management Report describes the existing drainage conditions and proposed stormwater best management practices (BMPs) designed to treat and control runoff for the proposed Parkway Apartments located at 1545-1555 VFW Parkway.

The Project site is an approximately 4.6-acre site located in the West Roxbury neighborhood of Boston, bound by the Veterans of Foreign Wars (VFW) Parkway to the east, Dedham Street to the north, Second Street to the west, and Prime Honda Boston to the south. The existing site currently contains a dilapidated surface parking lot, a private drive (Avenue A), and open space, much of which consists of previously developed areas. The site will be developed with a 254 unit residential, neighborhood apartment community in two detached, four-story buildings with 387 garage parking spaces.

The proposed stormwater management system will comply with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards, as required by 310 CMR 10.05(6)(k) and further described in the MassDEP Stormwater Management Policy Handbook. The proposed system will incorporate Best Management Practices (BMPs) including structural and non-structural measures providing stormwater quantity and quality management, as further discussed below.

The Project will result in an increase in impervious area of approximately 75,132 ft². Stormwater BMPs will be constructed to improve the water quality of runoff from all paved areas. Stormwater BMPs include deep sump catch basins, grassed swales, proprietary water quality units, and infiltration systems. Details of proprietary BMPs are in the plans included in Appendix H. These systems will capture and help reduce pollutant concentrations in the stormwater runoff and will maintain or reduce peak stormwater discharge rates released off-site.

Pre and post-construction hydrology was analyzed with HydroCAD v 10.0, model using TR-20 methodology. The rainfall data was obtained from the NOAA Atlas 14 Precipitation Frequency Data Server. The result of this analysis shows there will be no increase in the overall peak discharge rates in the pre- and post-development conditions for the 2-year, 10-year, and 100-year storm events analyzed.

Soils at the site are mapped as Udorthents, wet substratum which does not have an assigned Hydrologic Soil Group according to the Natural Resource Conservation Service (NRCS). The NRCS soil maps are included in Appendix A. Geotechnical investigation was performed by GZA starting in Spring of 2018. A report of its findings as completed on January 10, 2019 is included in Appendix A.

Based on the geotechnical investigations, the seasonal high groundwater elevation was estimated at 92.5' at Building A and 91.5' at Building B.

Hydrology

PRE-CONSTRUCTION HYDROLOGY

The hydrology calculations analyze three design points which all ultimately discharge to the Charles River: (DP#1) a 12" Corrugated Polyethylene Pipe (CPP) located off the northwesterly corner of the site at the intersecting private ways of Dedham Street and 2nd Street. (DP#2) another 12" CPP located east of the site near the intersecting private ways of A Street and 2nd Street. And (DP#3) offsite discharge which flows overland down the private way, E Street, to the Charles River. The existing project site is captured in five subcatchment areas. The subcatchment areas are shown on the plan entitled "Pre-Development Hydrology" provided in Appendix B.

POST-CONSTRUCTION HYDROLOGY

Best management Practices (BMPs) to control and treat stormwater runoff include deep sump catch basins, grassed swales, proprietary water quality units, and subsurface infiltration systems. These BMPs will improve the quality of stormwater runoff and reduce the peak flows to the storm drain system.

The proposed drainage design is shown on the plan entitled "Utility & Grading Plan" submitted as part of this NOI Application. The proposed project site was divided into 11 subcatchment areas. These subcatchment areas are shown on the plans entitled "Post-Development Hydrology" provided in Appendix C.

For all stormwater systems proposed on the site, outlet control structures will be installed to allow the maximum amount of storage and infiltration prior to any overflow discharging into adjacent storm systems. In the proposed condition, stormwater runoff generated from the open space on the northerly side of Building A (catchment P1) will be directed towards a subsurface infiltration system. Any bypass overflow from larger storm events will discharge to the existing closed drainage system in Dedham Street, a private way to north of the Site. Runoff from Building A (P4 and P6) and the Building A Courtyard area (P2 and P3) will be directed to a subsurface infiltration system in the open space behind Building A. Overflow from this system will discharge to the existing drain manhole near the intersection of A Street and 2nd Street (both private ways).

The driveway and open space frontage area to Building B (P9) and Building B Courtyard area (P10) will be directed to subsurface infiltration areas in the open space behind Building B. Bypass overflow from this system will discharge to the existing drain manhole at A Street and 2nd Street.

Runoff from areas from the open space at property boundary along 2nd street (P7 and P8) will discharge offsite flowing overland on 2nd Street to existing catch basins that discharge to the 12" CPP at A Street. And the runoff from open space along the southerly property boundary (P11) will continue to sheet flow overland off site towards E Street, a private way.

Runoff from A Street and northeasterly portions of the site (P5) will be directed to a subsurface infiltration system that will overflow in larger storm events to the existing manhole at the intersection of A Street and 2nd Street. Stormwater runoff from the driveway (A Street) will be captured by deep sump catch basin and directed to a proprietary water quality unit prior to discharging into the infiltration basin.

Stormwater Management Standards

STANDARD 1: NO NEW UNTREATED DISCHARGES

The Massachusetts Stormwater Handbook requires that the project demonstrates that there are no new untreated discharges and that new discharges will not cause erosion or scour to downstream wetlands.

Discharges are not anticipated to cause erosion or scour downstream wetlands since the stormwater management system is designed to reduce the peak flows off-site and contributing to the existing closed drainage system in the adjacent private roads.

Runoff from the paved areas will be treated and filtered through deep sump catch basins, proprietary water quality units, and subsurface infiltration systems. Rooftop runoff is directed to one of the several proposed subsurface infiltration systems. Other areas disturbed by construction will be stabilized with vegetation and are not expected to cause erosion our scour downstream.

STANDARD 2: POST-DEVELOPMENT PEAK DISCHARGE RATES NOT TO EXCEED PRE-DEVELOPMENT PEAK DISCHARGE RATES

The proposed stormwater management system is designed so that the post-development peak discharge rates will not exceed the off-site pre-development peak discharge rates. The peak discharge rate from the 2, 10 and 100-year storm events were analyzed with the result summarized in Table 1.

Table 1. Pre- Vs Post-Development Peak Discharge Rates

Design Point	Pre-Development Rate (cfs)	Post-Development Rate (cfs)
2-Year Storm Event		
DP #1: Dedham St CB	0.00	0.00
DP #2: 2nd St CB	1.54	0.64
DP #3: Floodplain Overflow	1.58	0.37
10-Year Storm Event		
DP #1: Dedham St CB	0.07	0.04
DP #2: 2nd St CB	5.32	4.78
DP #3: Floodplain Overflow	3.27	0.87
100-Year Storm Event		
DP #1: Dedham St CB	1.57	1.23
DP #2: 2nd St CB	13.15	11.78
DP #3: Floodplain Overflow	6.08	1.75

STANDARD 3: MINIMIZE OR ELIMINATE LOSS OF ANNUAL RECHARGE TO GROUNDWATER

The stormwater infiltration practices specified for the Project includes underground infiltrating chambers. The stormwater management system as designed will provide stormwater recharge exceeding the volume prescribed in the Massachusetts Stormwater Handbook, and will meet or exceed the recharge recommendations of the BPDA's Smart Utilities Policy. Recharge volume calculations are provided in Appendix D.

STANDARD 4: STORMWATER MANAGEMENT SYSTEM TO REMOVE 80% OF AVERAGE ANNUAL LOAD OF TOTAL SUSPENDED SOLIDS (TSS)

The stormwater management system is designed to remove 80% of the average annual total suspended solids (TSS) from the project site. This is accomplished by the installation of deep sump catch basins and proprietary water quality units. Calculations are provided in Appendix D.

STANDARD 5: LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS

The development is not considered a land use that produces higher potential pollutant loads as most of the parking is subsurface and will not be in direct contact with rainfall.

STANDARD 6: STORMWATER DISCHARGES TO CRITICAL AREAS

This standard is not applicable. The stormwater discharges are not located within or near a critical area.

STANDARD 7: REDEVELOPMENT PROJECTS

Portions of the site are considered redevelopment. The existing site currently contains a dilapidated surface parking lot and a private drive (A Street). Notwithstanding this condition, the proposed stormwater management system has been designed to comply fully with all applicable MassDEP Stormwater Standards, and will materially improve stormwater management at and from the site relative to existing conditions.

STANDARD 8: CONTROL CONSTRUCTION-RELATED IMPACTS

The project will install erosion and sediment controls prior to any major earthwork activity. Additionally, the Contractor will be required to prepare a Storm Water Pollution Prevention Plan in conjunction with the General Permit for Construction Activity that will have to be filed with the Environmental Protection Agency.

Sheet C1.0 of the project plans entitled "Site Preparation Plan" shows the location and BMPs that will be used during the construction process to protect neighboring properties and receiving drainage structures. A more detailed Stormwater Pollution Prevention Plan will be developed for this project once a construction contractor has been selected. This Plan will detail the practices and safeguards to be implemented in this project to provide source control and pollution prevention.

STANDARD 9: LONG-TERM OPERATION AND MAINTENANCE PLAN

See Appendix E for the operation and maintenance requirements to be implemented for the stormwater management system.

STANDARD 10: NO ILLICIT DISCHARGES

No illicit discharges exist on the site and pollution prevention measures will be provided to prevent illicit discharges to the stormwater management system. The Illicit Discharge Compliance Statement is provided in Appendix G.

Appendix A:
Soil Information

Map Scale: 1:3,340 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

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 Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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 14, Sep 12, 2018

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

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		9.1	17.0%
5	Saco silt loam, 0 to 3 percent slopes	B/D	2.8	5.2%
602	Urban land, 0 to 15 percent slopes		12.2	23.0%
603	Urban land, wet substratum, 0 to 3 percent slopes		4.1	7.6%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	6.4	12.0%
655	Udorthents, wet substratum		18.7	35.1%
Totals for Area of Interest			**53.3**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Map Scale: 1:3,340 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

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 14, Sep 12, 2018

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

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

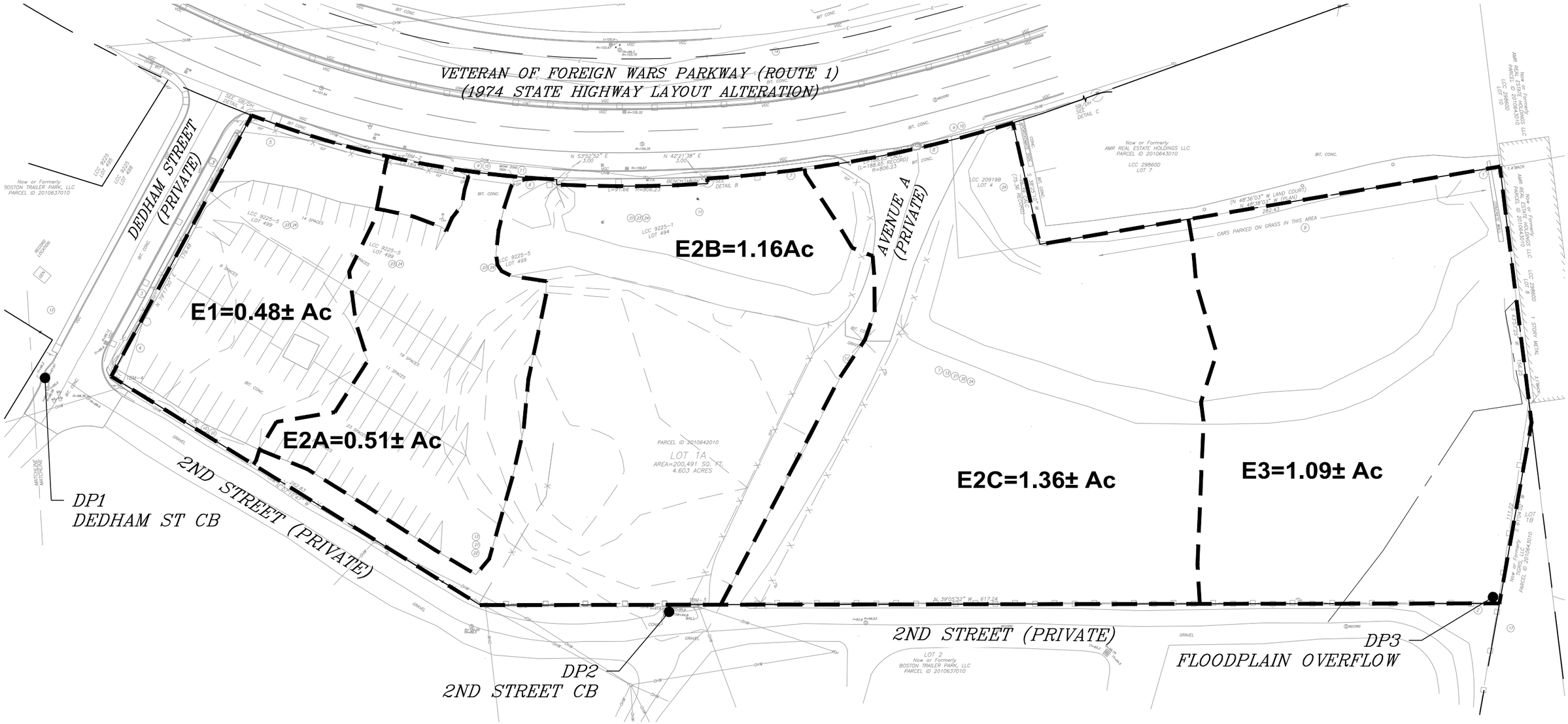
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	9.1	17.0%
5	Saco silt loam, 0 to 3 percent slopes	2.8	5.2%
602	Urban land, 0 to 15 percent slopes	12.2	23.0%
603	Urban land, wet substratum, 0 to 3 percent slopes	4.1	7.6%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	6.4	12.0%
655	Udorthents, wet substratum	18.7	35.1%
Totals for Area of Interest		**53.3**	**100.0%**

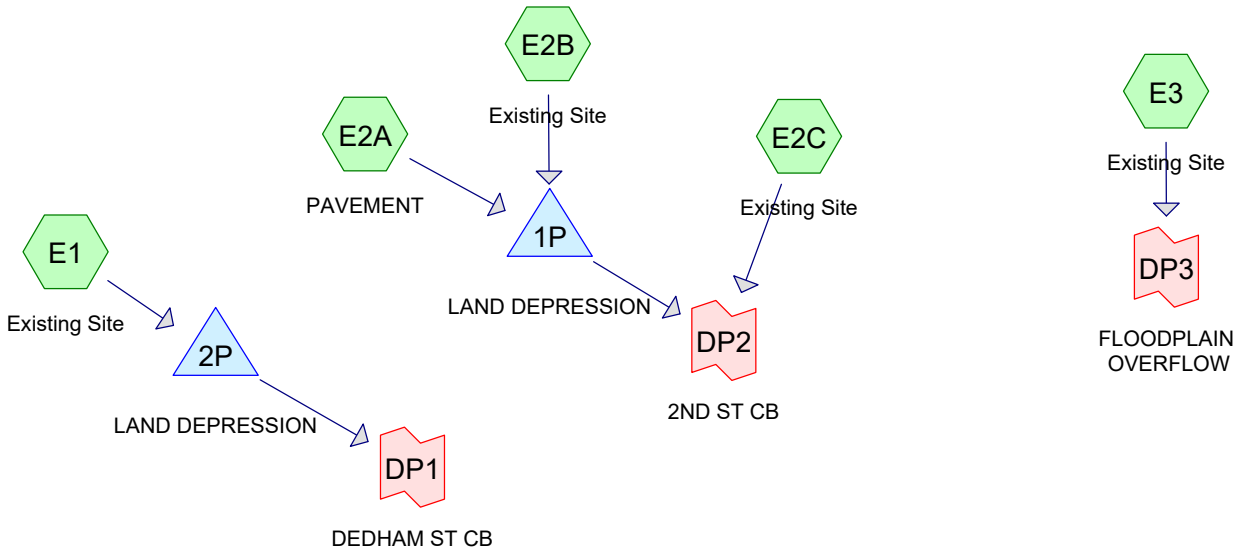
Appendix B:
Pre-Construction Hydrology

Figure 1 ***PRE DEVELOPMENT HYDROLOGY***



3/11/2019 L:\17163\Current\CUTSHEET\HYDROLOGY PRE.dwg
Jay Carroll

Approximate Scale: 1" = 60'-0"
Date: -11-2019



Subcat Reach Pond Link

Routing Diagram for HydroCAD_Pre
Prepared by {enter your company name here}, Printed 3/11/2019

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E1: Existing Site Runoff Area=20,687 sf 79.82% Impervious Runoff Depth>2.70"
Tc=6.0 min CN=94 Runoff=1.40 cfs 0.107 af

Subcatchment E2A: PAVEMENT Runoff Area=22,370 sf 100.00% Impervious Runoff Depth>3.12"
Tc=6.0 min CN=98 Runoff=1.64 cfs 0.134 af

Subcatchment E2B: Existing Site Runoff Area=50,325 sf 0.00% Impervious Runoff Depth>1.59"
Tc=12.0 min CN=81 Runoff=1.75 cfs 0.153 af

Subcatchment E2C: Existing Site Runoff Area=59,477 sf 6.62% Impervious Runoff Depth>1.66"
Tc=28.9 min CN=82 Runoff=1.53 cfs 0.189 af

Subcatchment E3: Existing Site Runoff Area=47,632 sf 0.00% Impervious Runoff Depth>1.52"
Tc=12.0 min CN=80 Runoff=1.58 cfs 0.139 af

Pond 1P: LAND DEPRESSION Peak Elev=97.68' Storage=7,972 cf Inflow=3.12 cfs 0.287 af
Outflow=0.26 cfs 0.128 af

Pond 2P: LAND DEPRESSION Peak Elev=98.49' Storage=4,648 cf Inflow=1.40 cfs 0.107 af
Outflow=0.00 cfs 0.000 af

Link DP1: DEDHAM ST CB Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP2: 2ND ST CB Inflow=1.54 cfs 0.317 af
Primary=1.54 cfs 0.317 af

Link DP3: FLOODPLAIN OVERFLOW Inflow=1.58 cfs 0.139 af
Primary=1.58 cfs 0.139 af

Total Runoff Area = 4.603 ac Runoff Volume = 0.721 af Average Runoff Depth = 1.88"
78.64% Pervious = 3.620 ac 21.36% Impervious = 0.983 ac

Summary for Subcatchment E1: Existing Site

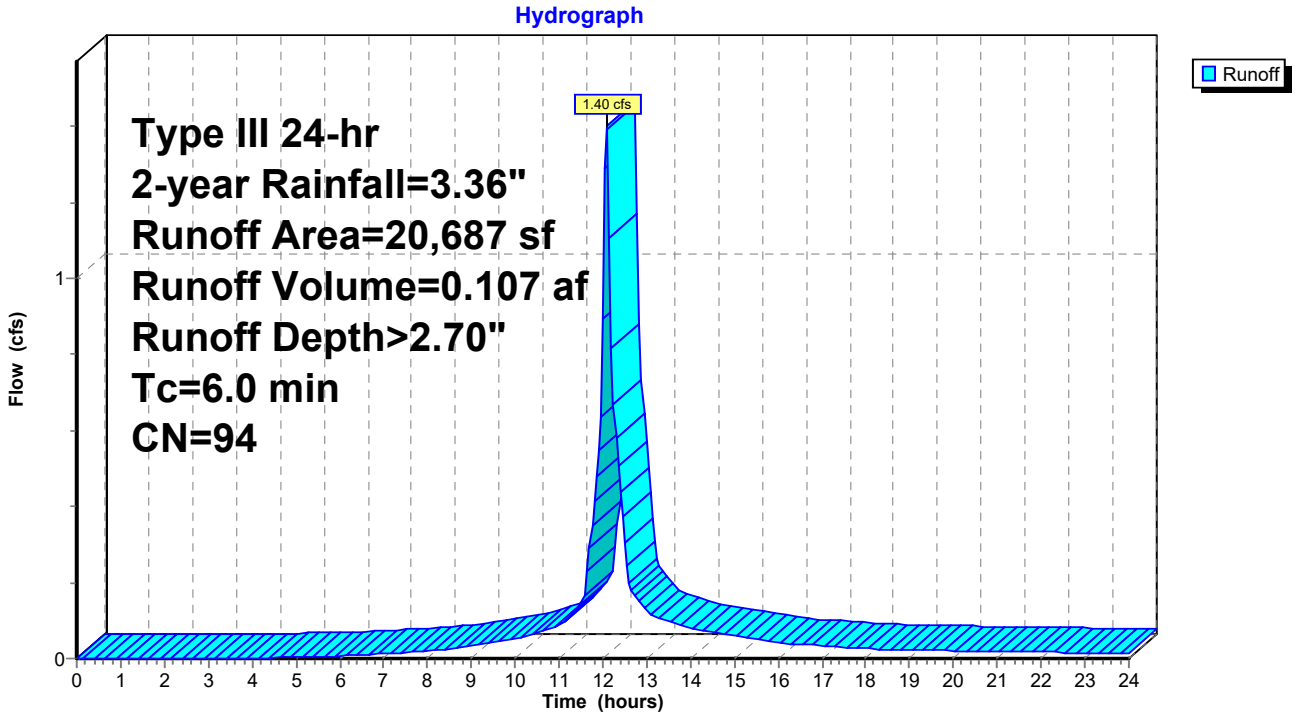
Runoff = 1.40 cfs @ 12.09 hrs, Volume= 0.107 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
16,513	98	Paved roads w/curbs & sewers, HSG D
4,174	80	>75% Grass cover, Good, HSG D
20,687	94	Weighted Average
4,174		20.18% Pervious Area
16,513		79.82% Impervious Area

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

Subcatchment E1: Existing Site



Summary for Subcatchment E2A: PAVEMENT

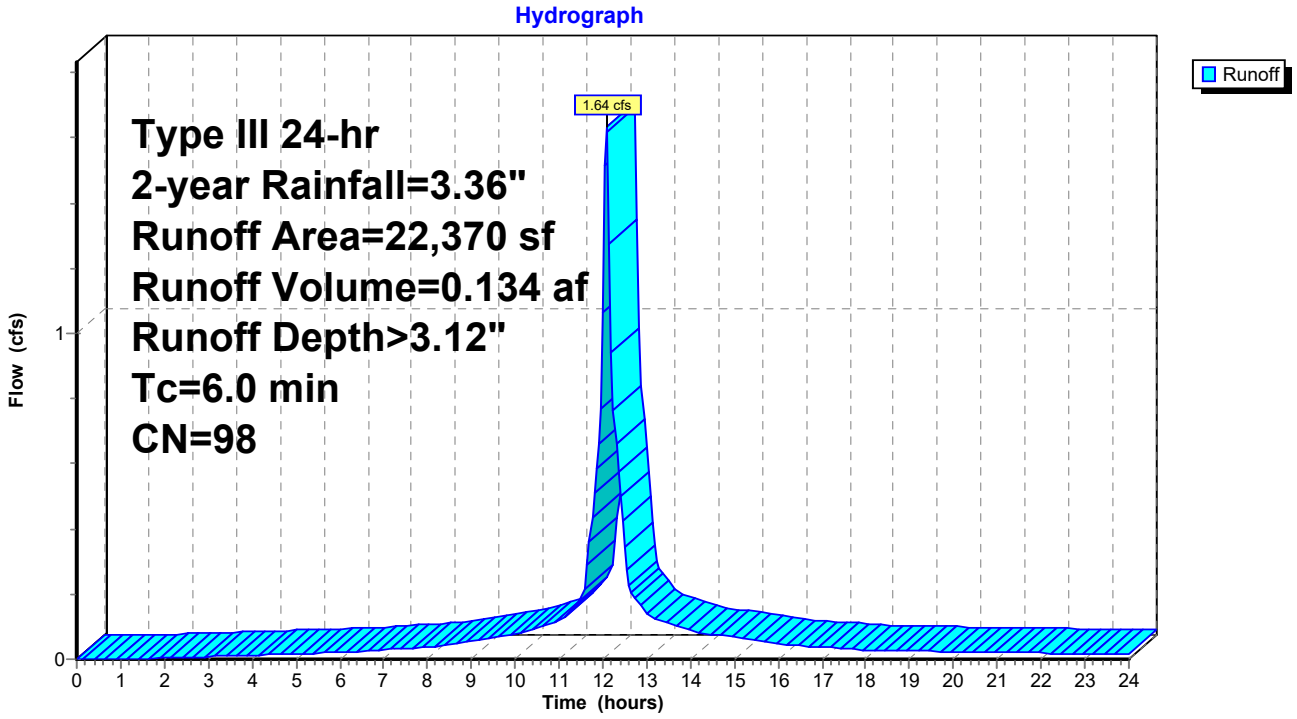
Runoff = 1.64 cfs @ 12.09 hrs, Volume= 0.134 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
22,370	98	Paved parking, HSG D
22,370		100.00% Impervious Area

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

Subcatchment E2A: PAVEMENT



Summary for Subcatchment E2B: Existing Site

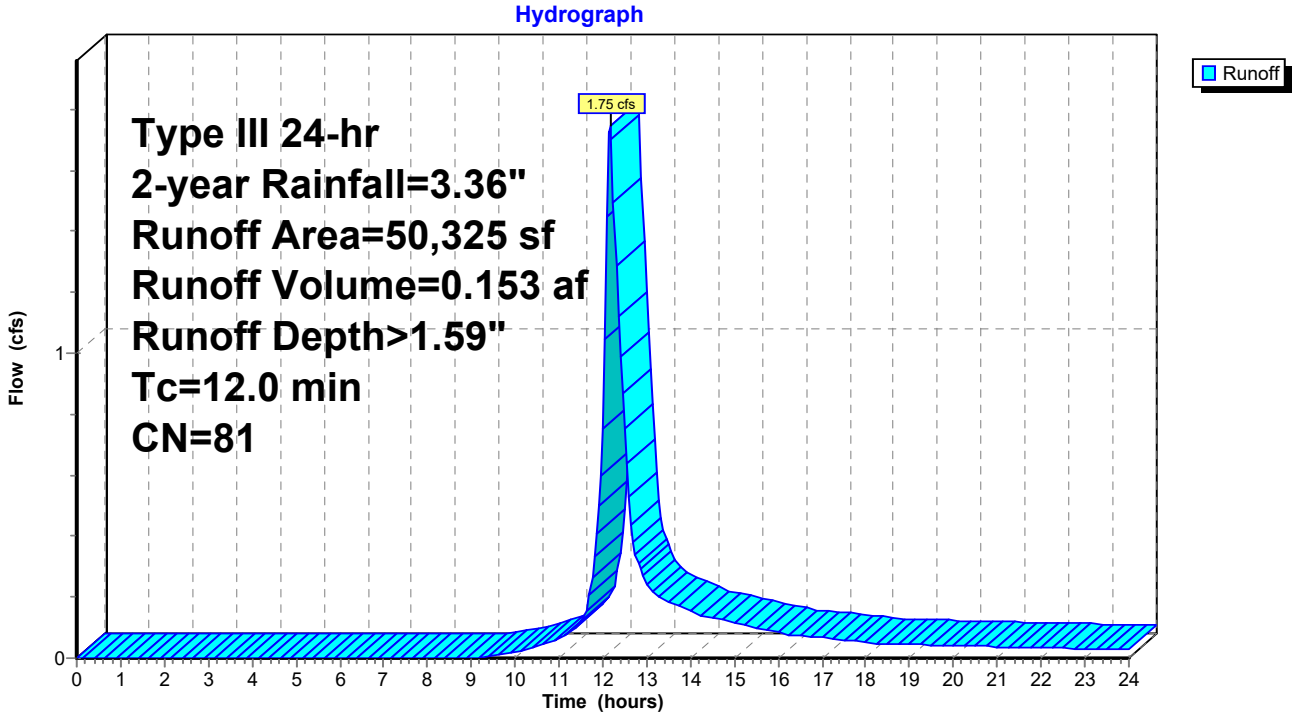
Runoff = 1.75 cfs @ 12.17 hrs, Volume= 0.153 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
3,323	96	Gravel surface, HSG D
47,002	80	>75% Grass cover, Good, HSG D
50,325	81	Weighted Average
50,325		100.00% Pervious Area

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

Subcatchment E2B: Existing Site



Summary for Subcatchment E2C: Existing Site

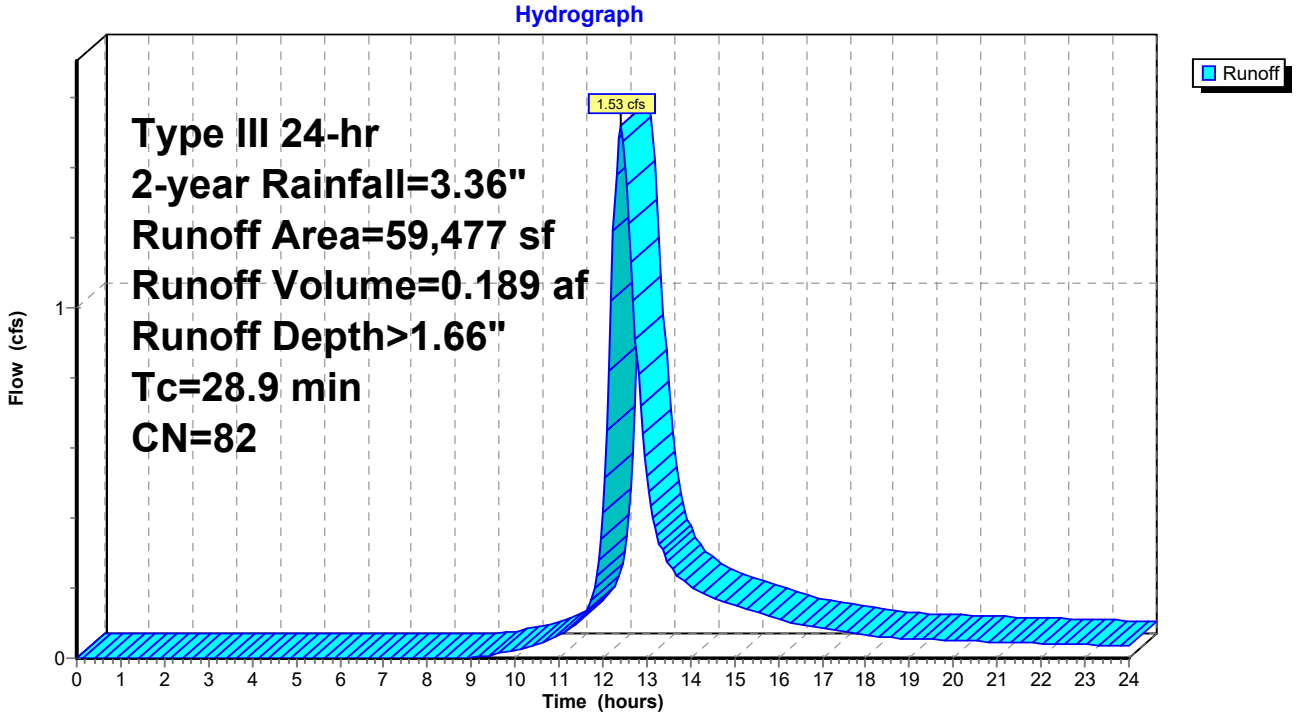
Runoff = 1.53 cfs @ 12.41 hrs, Volume= 0.189 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
3,935	98	Paved parking, HSG D
2,930	96	Gravel surface, HSG D
52,612	80	>75% Grass cover, Good, HSG D
59,477	82	Weighted Average
55,542		93.38% Pervious Area
3,935		6.62% Impervious Area

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

Subcatchment E2C: Existing Site



Summary for Subcatchment E3: Existing Site

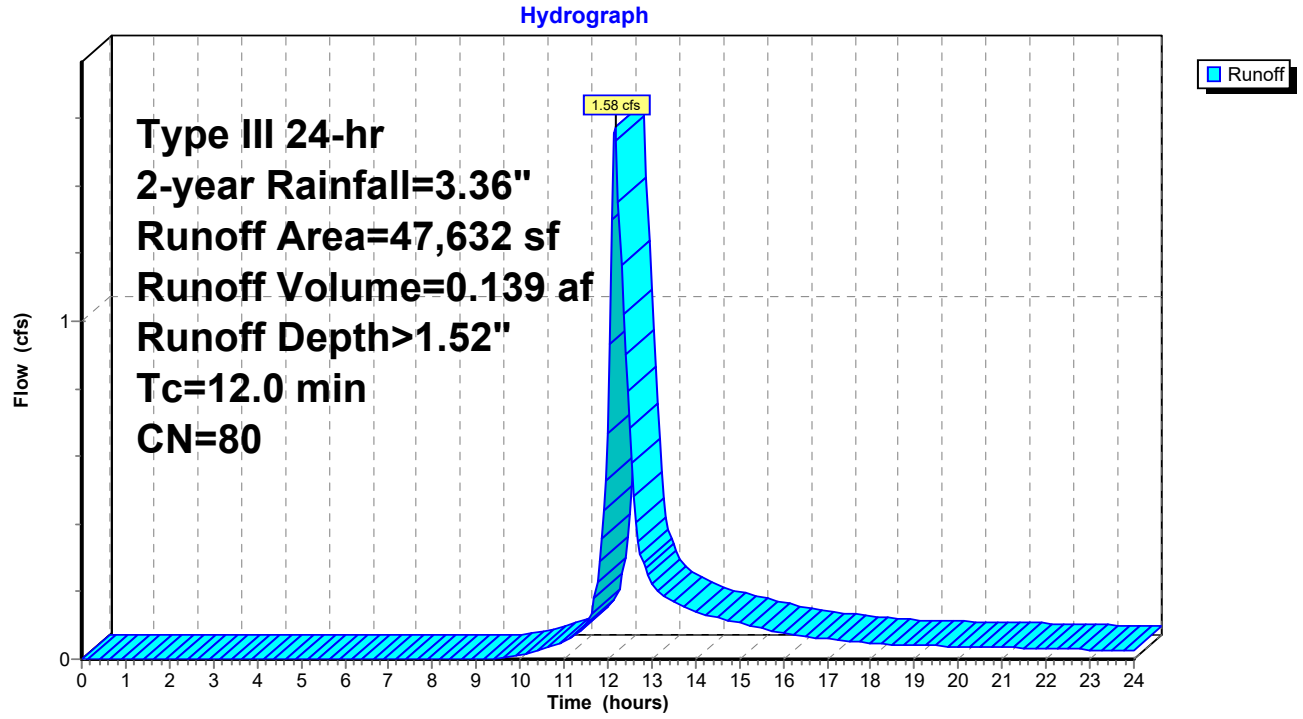
Runoff = 1.58 cfs @ 12.17 hrs, Volume= 0.139 af, Depth> 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
47,632	80	>75% Grass cover, Good, HSG D
47,632		100.00% Pervious Area

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

Subcatchment E3: Existing Site



Summary for Pond 1P: LAND DEPRESSION

Inflow Area = 1.669 ac, 30.77% Impervious, Inflow Depth > 2.06" for 2-year event
Inflow = 3.12 cfs @ 12.12 hrs, Volume= 0.287 af
Outflow = 0.26 cfs @ 13.85 hrs, Volume= 0.128 af, Atten= 92%, Lag= 103.9 min
Primary = 0.26 cfs @ 13.85 hrs, Volume= 0.128 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 97.68' @ 13.85 hrs Surf.Area= 21,630 sf Storage= 7,972 cf

Plug-Flow detention time= 328.7 min calculated for 0.128 af (45% of inflow)
Center-of-Mass det. time= 199.8 min (1,000.9 - 801.1)

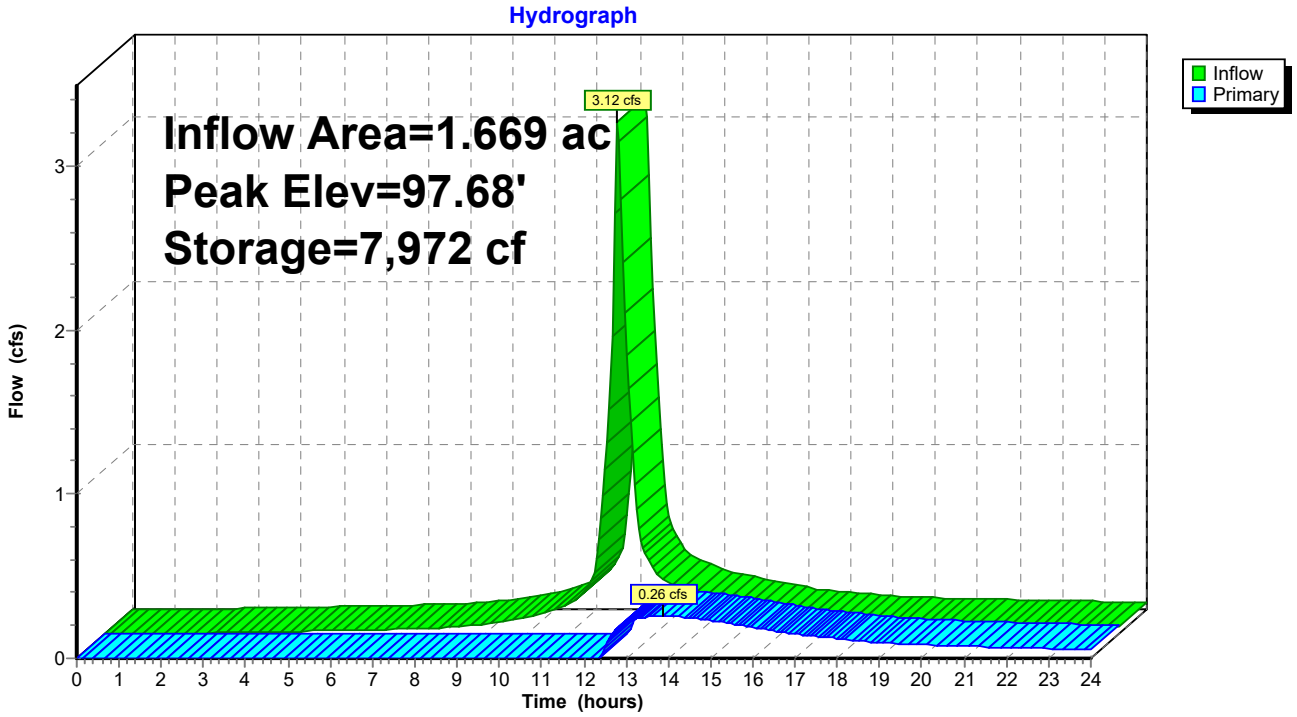
Volume	Invert	Avail.Storage	Storage Description
#1	96.60'	17,245 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
96.60	100	40.0	0	0	100
97.00	3,692	275.0	587	587	5,991
97.50	14,310	498.0	4,212	4,798	19,710
97.80	27,529	620.0	6,169	10,967	30,565
98.00	35,418	730.0	6,278	17,245	42,383

Device	Routing	Invert	Outlet Devices
#1	Primary	97.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	97.80'	**172.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.26 cfs @ 13.85 hrs HW=97.68' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.26 cfs @ 0.66 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: LAND DEPRESSION



Summary for Pond 2P: LAND DEPRESSION

Inflow Area = 0.475 ac, 79.82% Impervious, Inflow Depth > 2.70" for 2-year event
Inflow = 1.40 cfs @ 12.09 hrs, Volume= 0.107 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 98.49' @ 24.00 hrs Surf.Area= 9,556 sf Storage= 4,648 cf

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

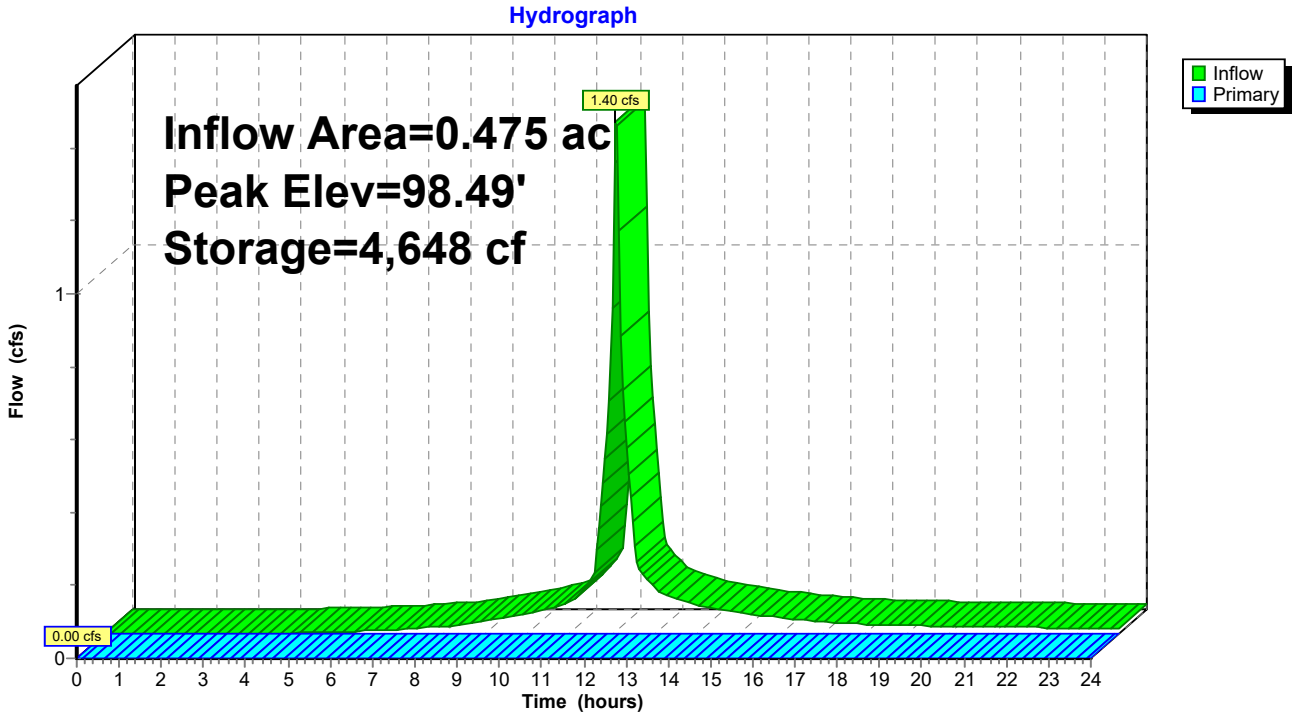
Volume	Invert	Avail.Storage	Storage Description
#1	97.11'	7,470 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.11	18	15.0	0	0	18
98.00	4,261	310.0	1,352	1,352	7,649
98.74	13,078	467.0	6,118	7,470	17,361

Device	Routing	Invert	Outlet Devices
#1	Primary	98.63'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	98.70'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=97.11' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: LAND DEPRESSION

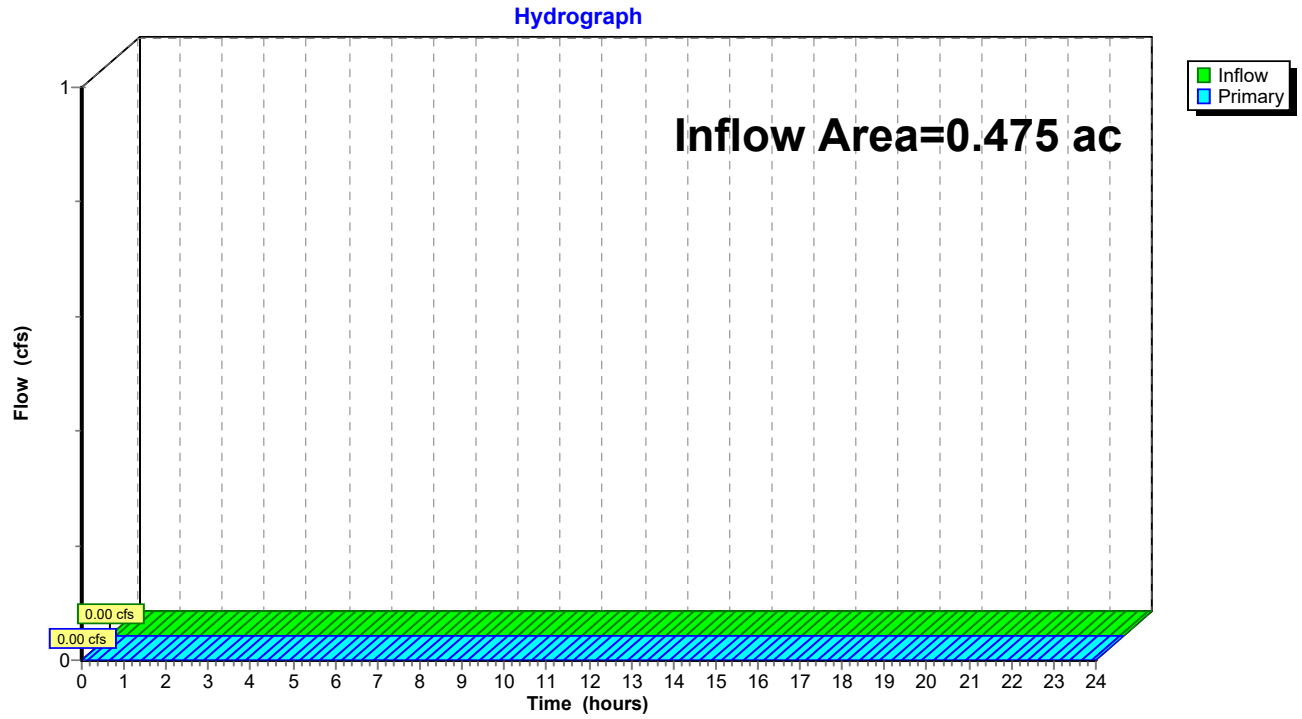


Summary for Link DP1: DEDHAM ST CB

Inflow Area = 0.475 ac, 79.82% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DEDHAM ST CB

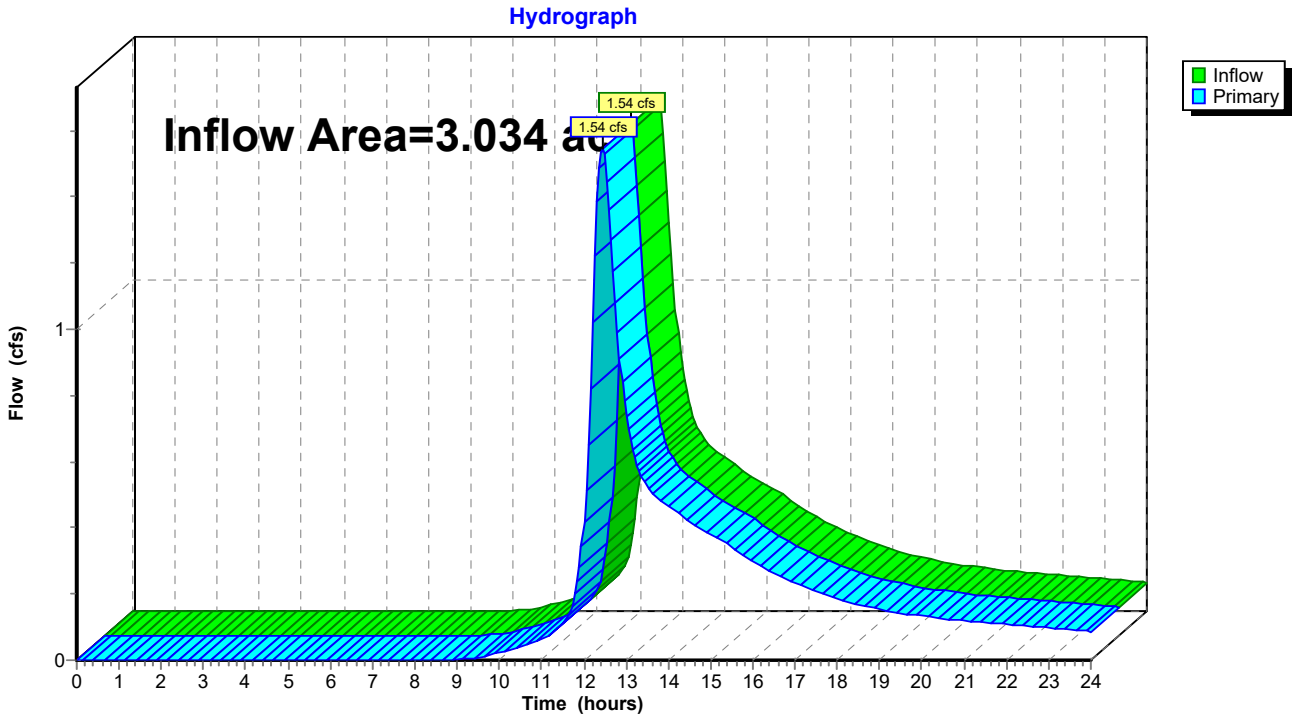


Summary for Link DP2: 2ND ST CB

Inflow Area = 3.034 ac, 19.90% Impervious, Inflow Depth > 1.25" for 2-year event
Inflow = 1.54 cfs @ 12.44 hrs, Volume= 0.317 af
Primary = 1.54 cfs @ 12.44 hrs, Volume= 0.317 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2: 2ND ST CB

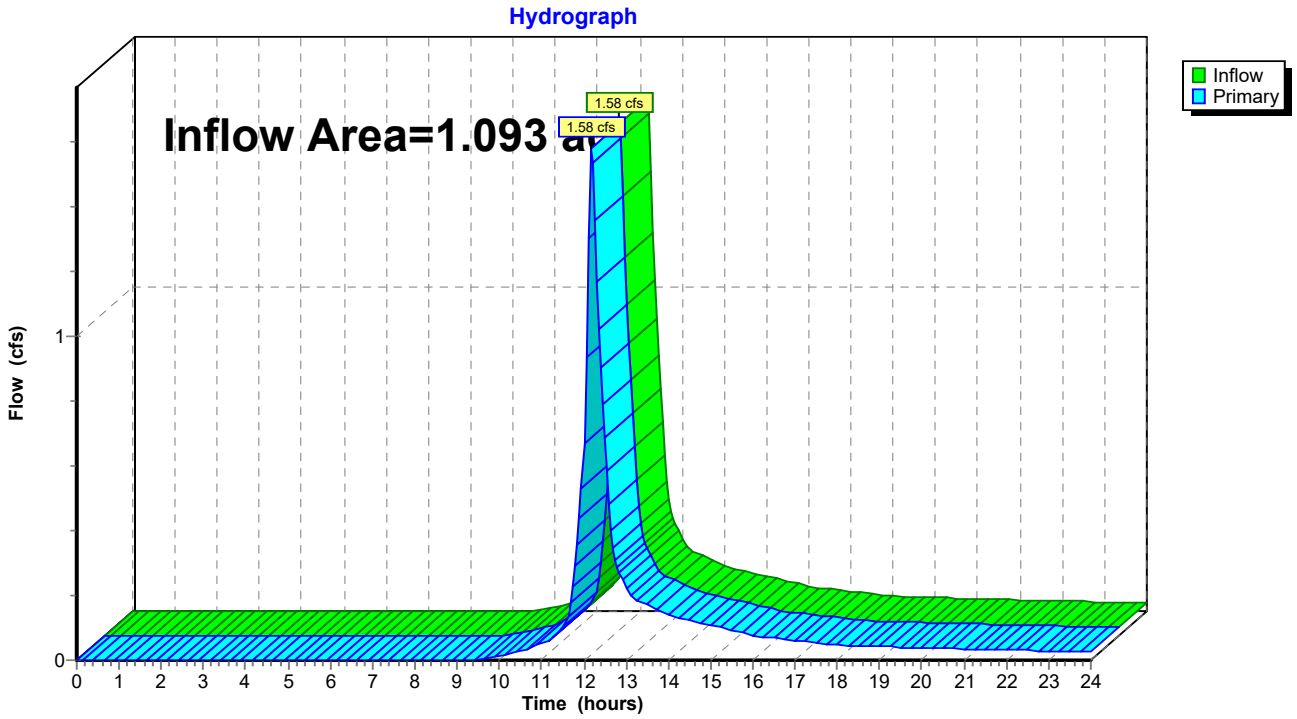


Summary for Link DP3: FLOODPLAIN OVERFLOW

Inflow Area = 1.093 ac, 0.00% Impervious, Inflow Depth > 1.52" for 2-year event
Inflow = 1.58 cfs @ 12.17 hrs, Volume= 0.139 af
Primary = 1.58 cfs @ 12.17 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: FLOODPLAIN OVERFLOW



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E1: Existing Site Runoff Area=20,687 sf 79.82% Impervious Runoff Depth>4.57"
Tc=6.0 min CN=94 Runoff=2.31 cfs 0.181 af

Subcatchment E2A: PAVEMENT Runoff Area=22,370 sf 100.00% Impervious Runoff Depth>5.03"
Tc=6.0 min CN=98 Runoff=2.59 cfs 0.215 af

Subcatchment E2B: Existing Site Runoff Area=50,325 sf 0.00% Impervious Runoff Depth>3.22"
Tc=12.0 min CN=81 Runoff=3.56 cfs 0.310 af

Subcatchment E2C: Existing Site Runoff Area=59,477 sf 6.62% Impervious Runoff Depth>3.30"
Tc=28.9 min CN=82 Runoff=3.04 cfs 0.376 af

Subcatchment E3: Existing Site Runoff Area=47,632 sf 0.00% Impervious Runoff Depth>3.12"
Tc=12.0 min CN=80 Runoff=3.27 cfs 0.285 af

Pond 1P: LAND DEPRESSION Peak Elev=97.82' Storage=11,482 cf Inflow=5.69 cfs 0.525 af
Outflow=2.33 cfs 0.361 af

Pond 2P: LAND DEPRESSION Peak Elev=98.66' Storage=6,498 cf Inflow=2.31 cfs 0.181 af
Outflow=0.07 cfs 0.036 af

Link DP1: DEDHAM ST CB Inflow=0.07 cfs 0.036 af
Primary=0.07 cfs 0.036 af

Link DP2: 2ND ST CB Inflow=5.32 cfs 0.737 af
Primary=5.32 cfs 0.737 af

Link DP3: FLOODPLAIN OVERFLOW Inflow=3.27 cfs 0.285 af
Primary=3.27 cfs 0.285 af

Total Runoff Area = 4.603 ac Runoff Volume = 1.367 af Average Runoff Depth = 3.56"
78.64% Pervious = 3.620 ac 21.36% Impervious = 0.983 ac

Summary for Subcatchment E1: Existing Site

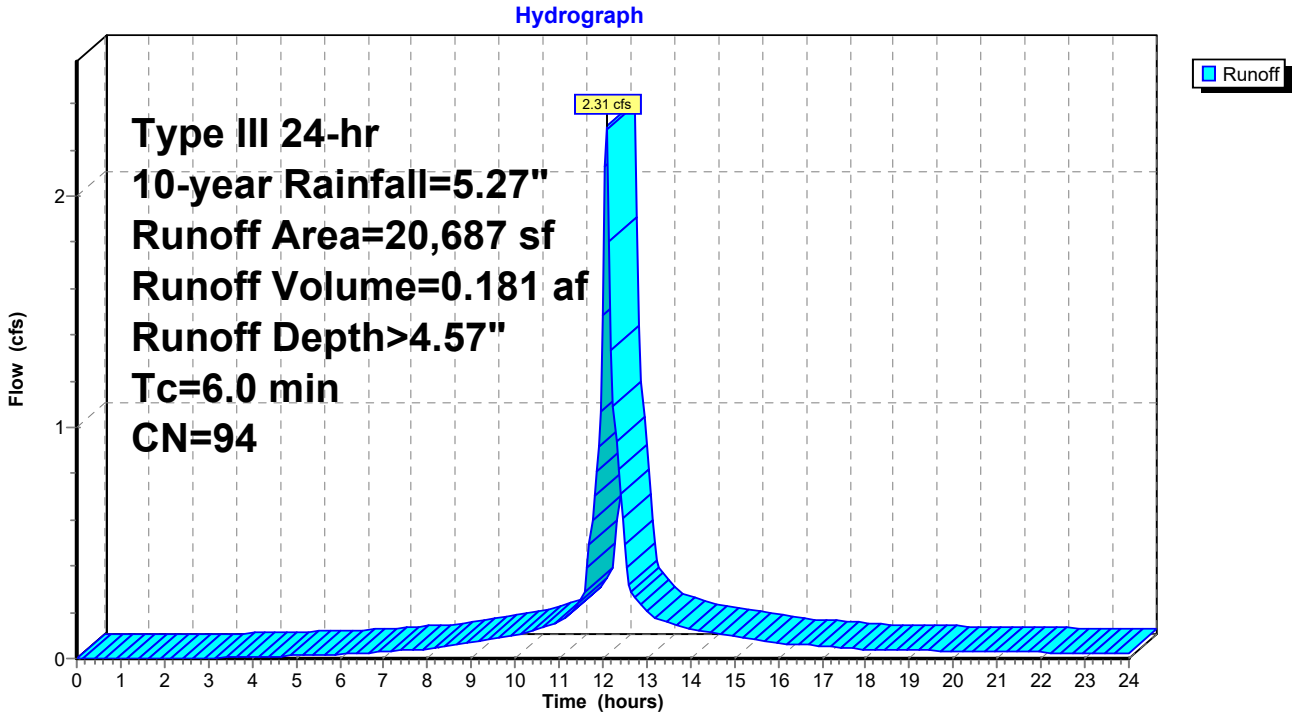
Runoff = 2.31 cfs @ 12.09 hrs, Volume= 0.181 af, Depth> 4.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
16,513	98	Paved roads w/curbs & sewers, HSG D
4,174	80	>75% Grass cover, Good, HSG D
20,687	94	Weighted Average
4,174		20.18% Pervious Area
16,513		79.82% Impervious Area

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

Subcatchment E1: Existing Site



Summary for Subcatchment E2A: PAVEMENT

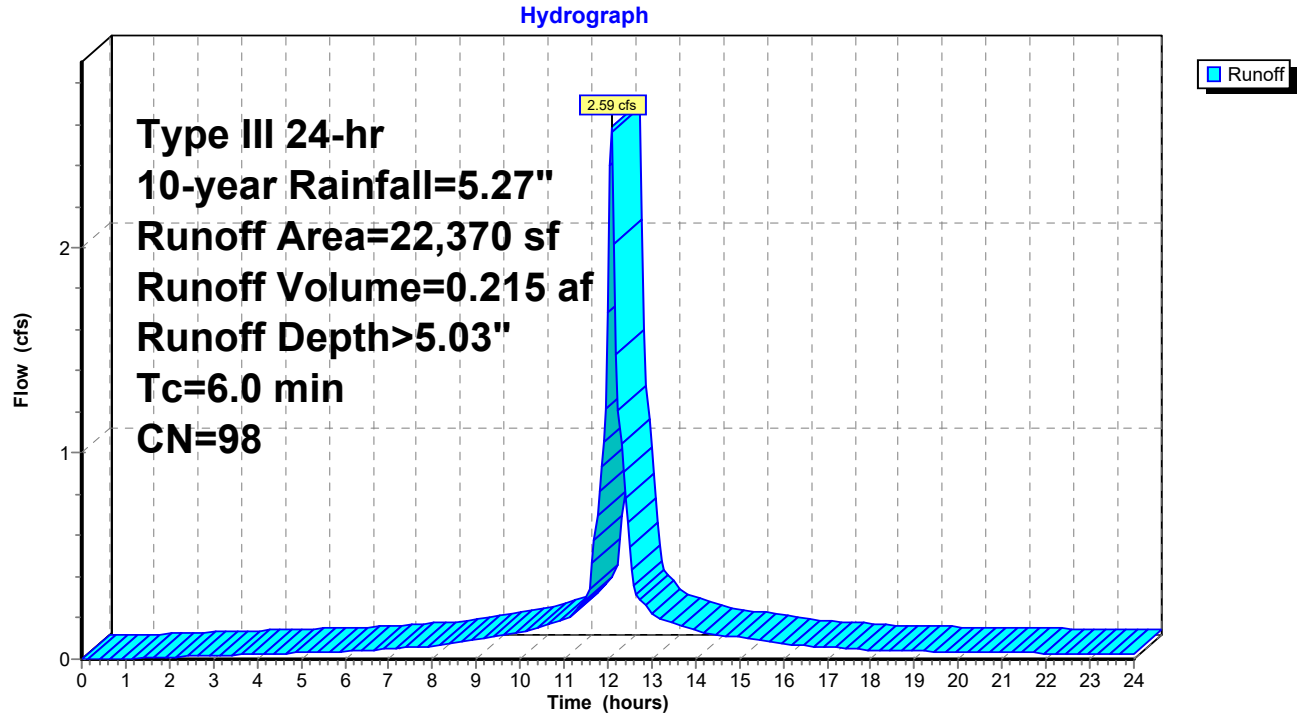
Runoff = 2.59 cfs @ 12.09 hrs, Volume= 0.215 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
22,370	98	Paved parking, HSG D
22,370		100.00% Impervious Area

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

Subcatchment E2A: PAVEMENT



Summary for Subcatchment E2B: Existing Site

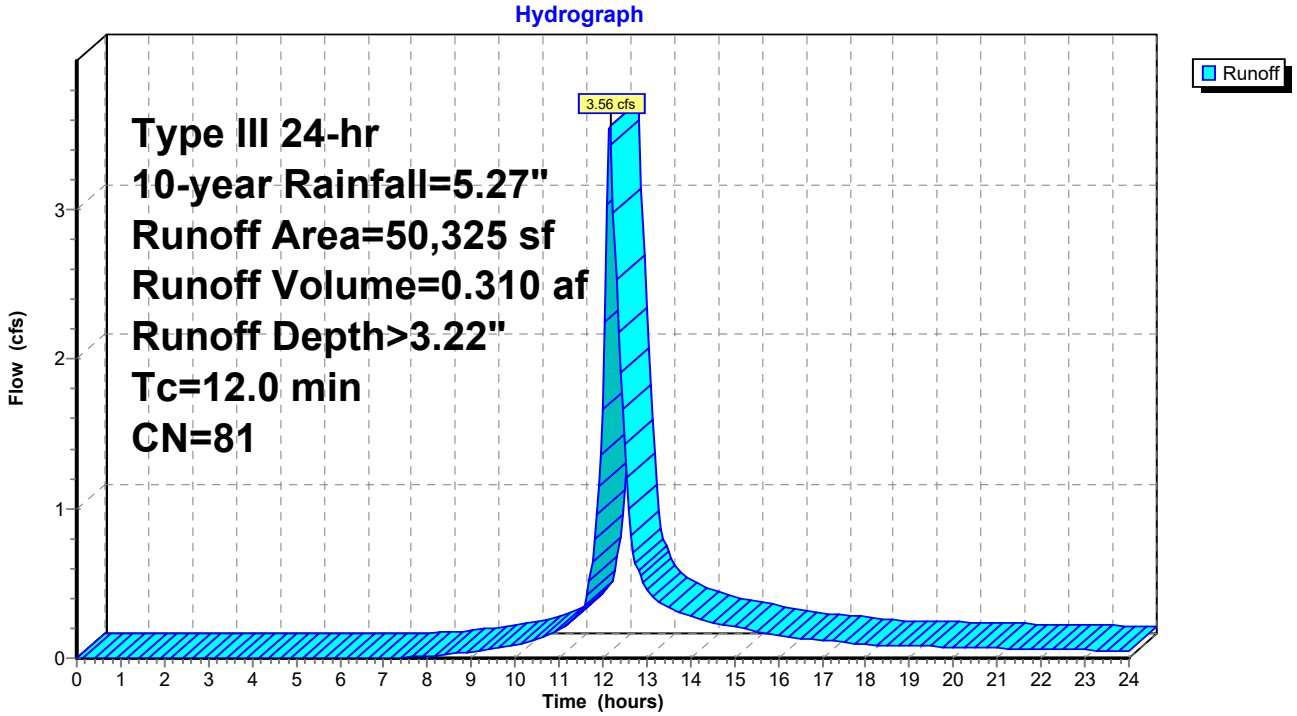
Runoff = 3.56 cfs @ 12.17 hrs, Volume= 0.310 af, Depth> 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
3,323	96	Gravel surface, HSG D
47,002	80	>75% Grass cover, Good, HSG D
50,325	81	Weighted Average
50,325		100.00% Pervious Area

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

Subcatchment E2B: Existing Site



Summary for Subcatchment E2C: Existing Site

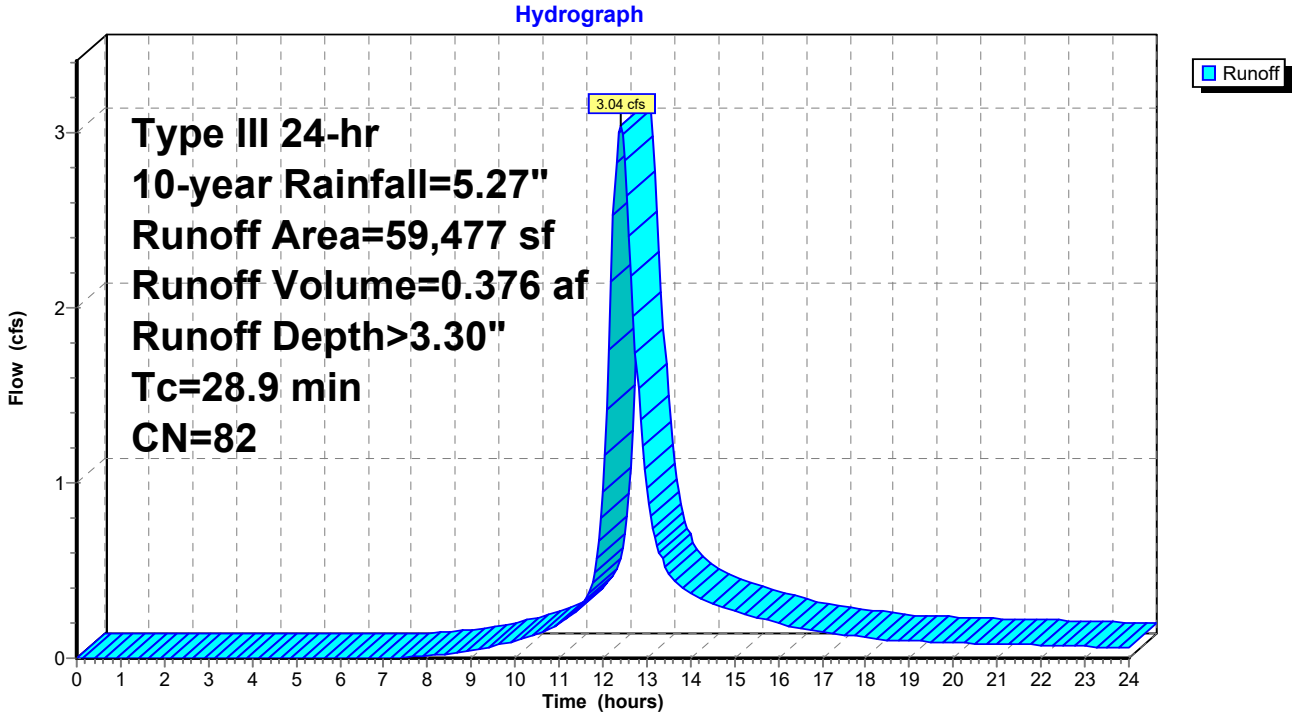
Runoff = 3.04 cfs @ 12.40 hrs, Volume= 0.376 af, Depth> 3.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
3,935	98	Paved parking, HSG D
2,930	96	Gravel surface, HSG D
52,612	80	>75% Grass cover, Good, HSG D
59,477	82	Weighted Average
55,542		93.38% Pervious Area
3,935		6.62% Impervious Area

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

Subcatchment E2C: Existing Site



Summary for Subcatchment E3: Existing Site

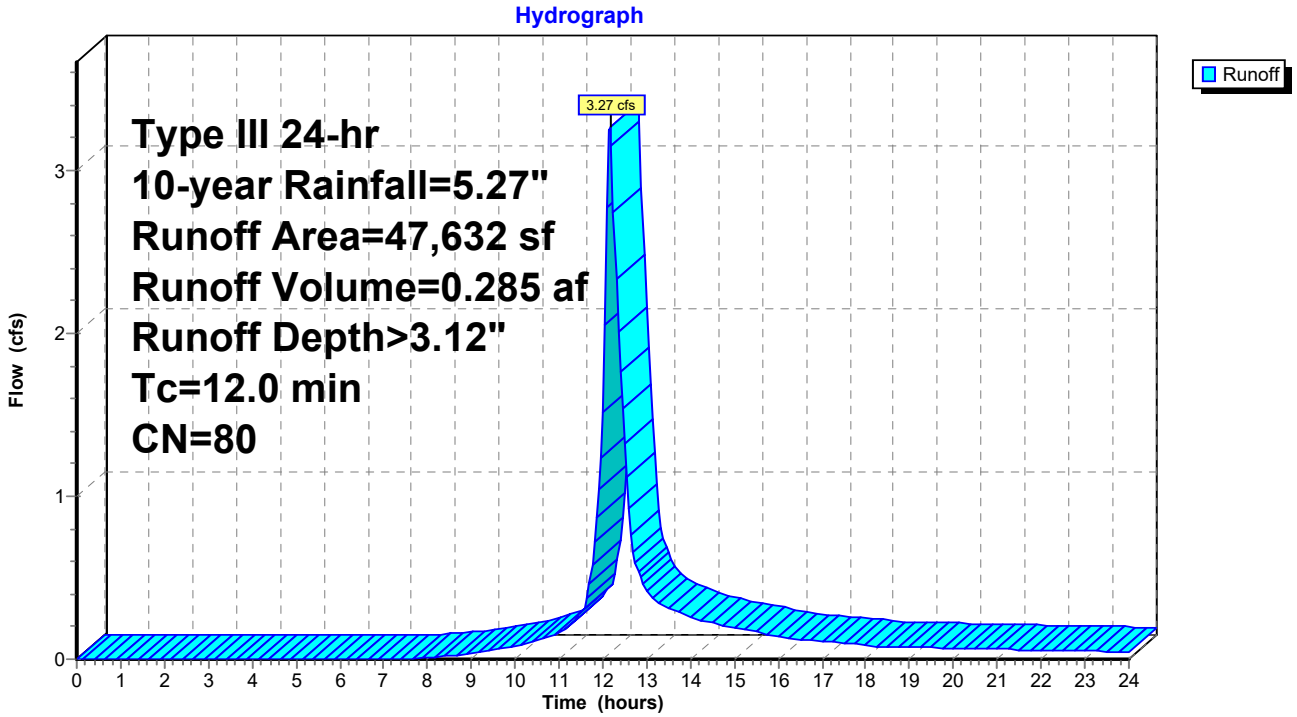
Runoff = 3.27 cfs @ 12.17 hrs, Volume= 0.285 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
47,632	80	>75% Grass cover, Good, HSG D
47,632		100.00% Pervious Area

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

Subcatchment E3: Existing Site



Summary for Pond 1P: LAND DEPRESSION

Inflow Area = 1.669 ac, 30.77% Impervious, Inflow Depth > 3.78" for 10-year event
Inflow = 5.69 cfs @ 12.12 hrs, Volume= 0.525 af
Outflow = 2.33 cfs @ 12.46 hrs, Volume= 0.361 af, Atten= 59%, Lag= 20.0 min
Primary = 2.33 cfs @ 12.46 hrs, Volume= 0.361 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 97.82' @ 12.46 hrs Surf.Area= 28,217 sf Storage= 11,482 cf

Plug-Flow detention time= 216.5 min calculated for 0.361 af (69% of inflow)
Center-of-Mass det. time= 120.9 min (911.5 - 790.7)

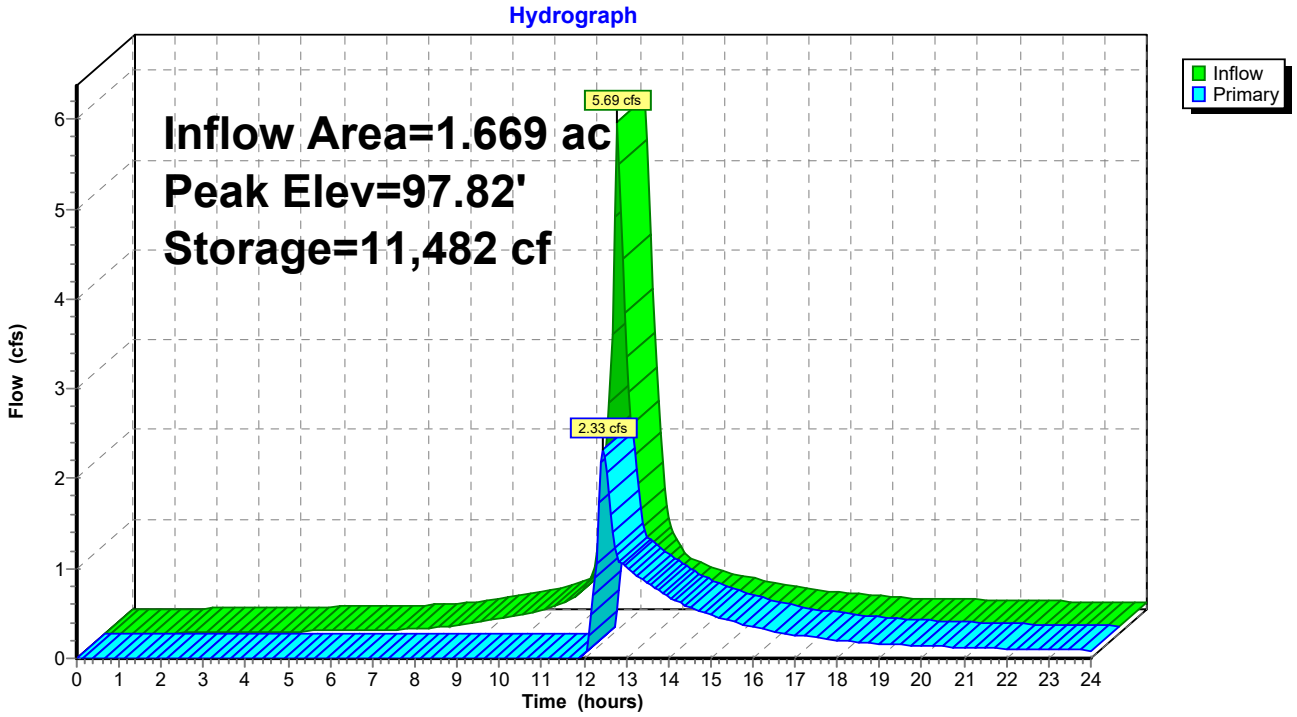
Volume	Invert	Avail.Storage	Storage Description
#1	96.60'	17,245 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
96.60	100	40.0	0	0	100
97.00	3,692	275.0	587	587	5,991
97.50	14,310	498.0	4,212	4,798	19,710
97.80	27,529	620.0	6,169	10,967	30,565
98.00	35,418	730.0	6,278	17,245	42,383

Device	Routing	Invert	Outlet Devices
#1	Primary	97.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	97.80'	**172.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.31 cfs @ 12.46 hrs HW=97.82' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.22 cfs @ 1.12 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 1.09 cfs @ 0.34 fps)

Pond 1P: LAND DEPRESSION



Summary for Pond 2P: LAND DEPRESSION

Inflow Area = 0.475 ac, 79.82% Impervious, Inflow Depth > 4.57" for 10-year event
Inflow = 2.31 cfs @ 12.09 hrs, Volume= 0.181 af
Outflow = 0.07 cfs @ 15.91 hrs, Volume= 0.036 af, Atten= 97%, Lag= 229.1 min
Primary = 0.07 cfs @ 15.91 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 98.66' @ 15.91 hrs Surf.Area= 11,925 sf Storage= 6,498 cf

Plug-Flow detention time= 544.0 min calculated for 0.036 af (20% of inflow)
Center-of-Mass det. time= 333.5 min (1,105.1 - 771.6)

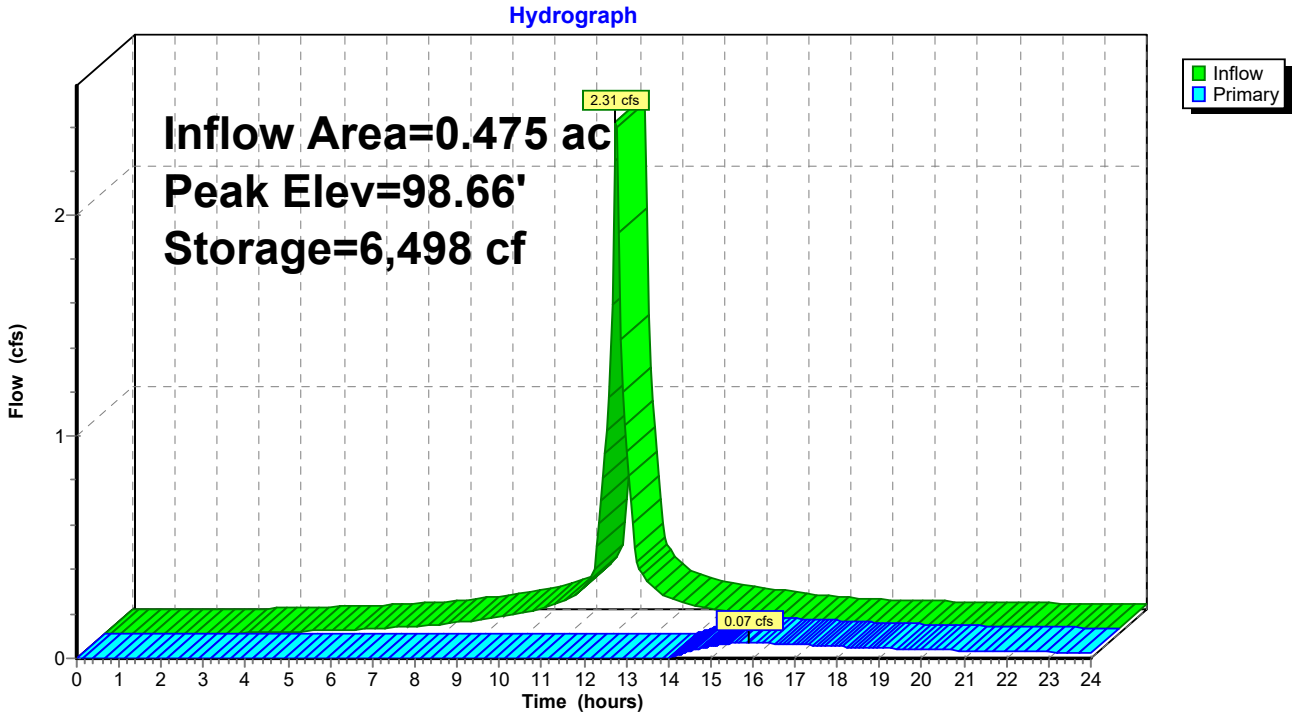
Volume	Invert	Avail.Storage	Storage Description
#1	97.11'	7,470 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.11	18	15.0	0	0	18
98.00	4,261	310.0	1,352	1,352	7,649
98.74	13,078	467.0	6,118	7,470	17,361

Device	Routing	Invert	Outlet Devices
#1	Primary	98.63'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	98.70'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.07 cfs @ 15.91 hrs HW=98.66' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.43 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: LAND DEPRESSION

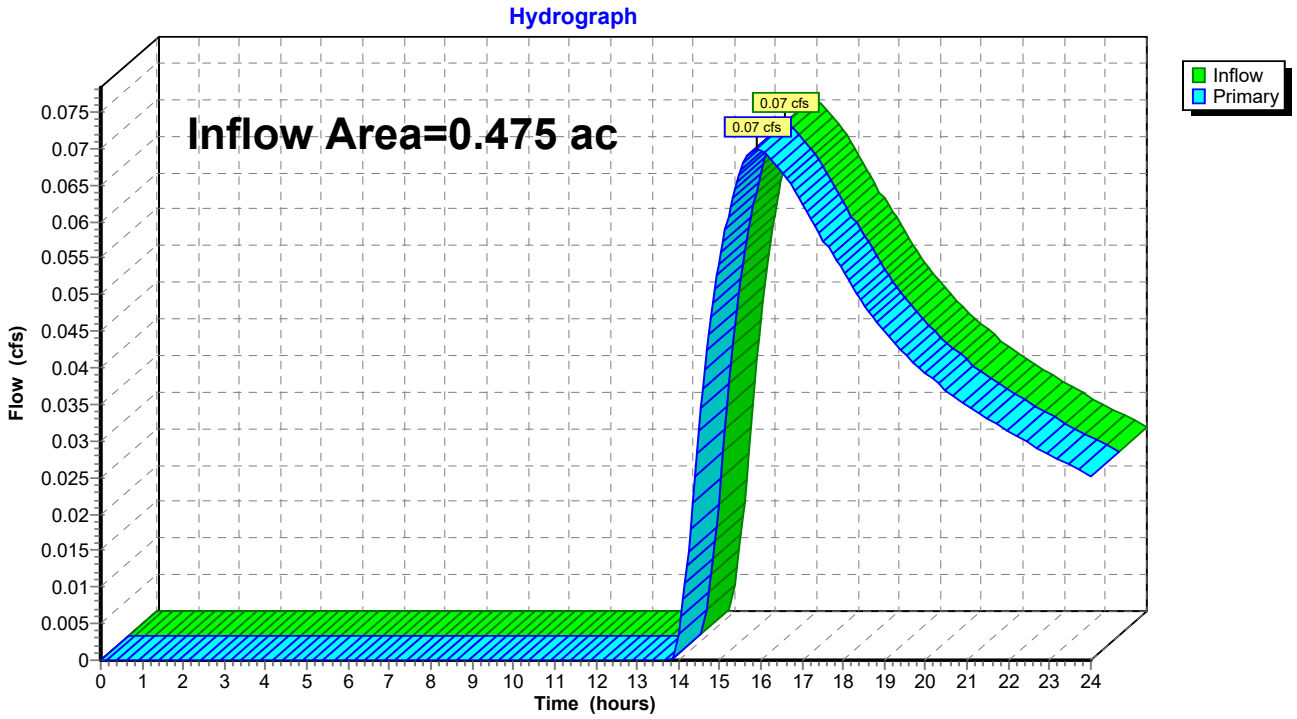


Summary for Link DP1: DEDHAM ST CB

Inflow Area = 0.475 ac, 79.82% Impervious, Inflow Depth > 0.91" for 10-year event
Inflow = 0.07 cfs @ 15.91 hrs, Volume= 0.036 af
Primary = 0.07 cfs @ 15.91 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DEDHAM ST CB

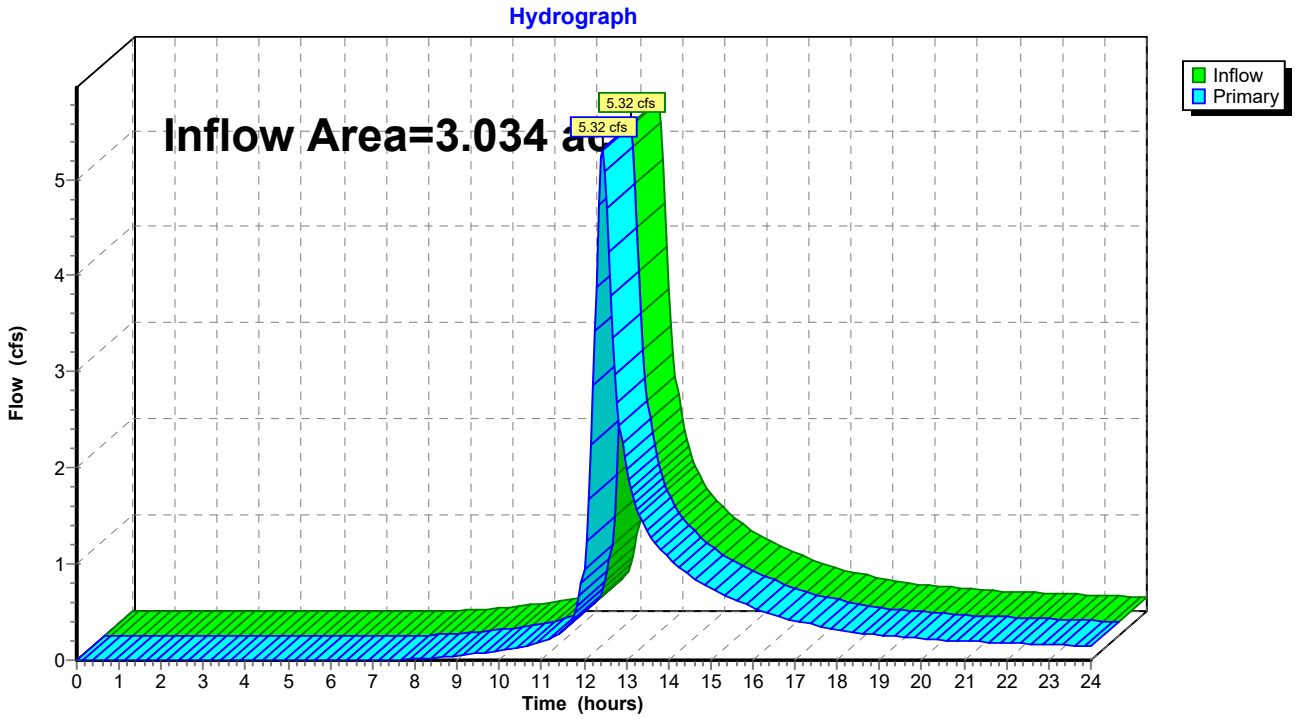


Summary for Link DP2: 2ND ST CB

Inflow Area = 3.034 ac, 19.90% Impervious, Inflow Depth > 2.92" for 10-year event
Inflow = 5.32 cfs @ 12.44 hrs, Volume= 0.737 af
Primary = 5.32 cfs @ 12.44 hrs, Volume= 0.737 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2: 2ND ST CB

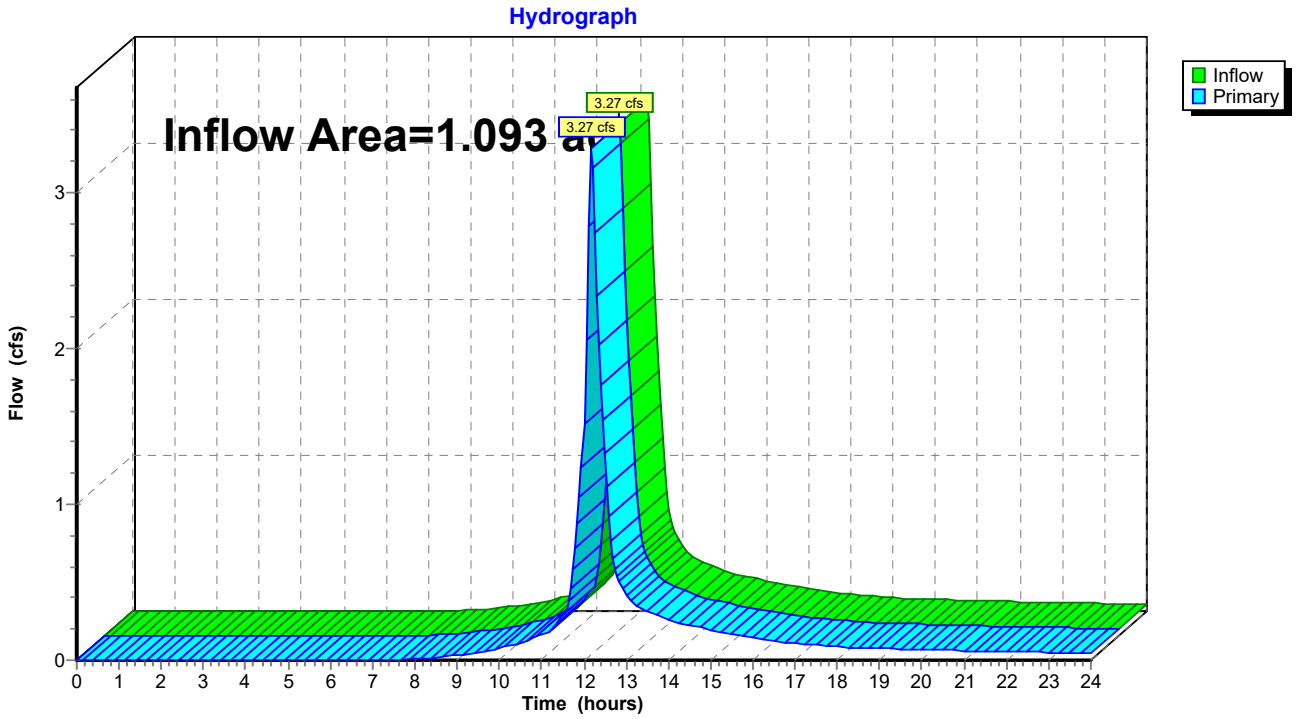


Summary for Link DP3: FLOODPLAIN OVERFLOW

Inflow Area = 1.093 ac, 0.00% Impervious, Inflow Depth > 3.12" for 10-year event
Inflow = 3.27 cfs @ 12.17 hrs, Volume= 0.285 af
Primary = 3.27 cfs @ 12.17 hrs, Volume= 0.285 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: FLOODPLAIN OVERFLOW



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 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 E1: Existing Site Runoff Area=20,687 sf 79.82% Impervious Runoff Depth>7.57"
Tc=6.0 min CN=94 Runoff=3.71 cfs 0.299 af

Subcatchment E2A: PAVEMENT Runoff Area=22,370 sf 100.00% Impervious Runoff Depth>8.05"
Tc=6.0 min CN=98 Runoff=4.08 cfs 0.344 af

Subcatchment E2B: Existing Site Runoff Area=50,325 sf 0.00% Impervious Runoff Depth>6.01"
Tc=12.0 min CN=81 Runoff=6.53 cfs 0.578 af

Subcatchment E2C: Existing Site Runoff Area=59,477 sf 6.62% Impervious Runoff Depth>6.11"
Tc=28.9 min CN=82 Runoff=5.53 cfs 0.695 af

Subcatchment E3: Existing Site Runoff Area=47,632 sf 0.00% Impervious Runoff Depth>5.89"
Tc=12.0 min CN=80 Runoff=6.08 cfs 0.536 af

Pond 1P: LAND DEPRESSION Peak Elev=97.87' Storage=12,864 cf Inflow=9.89 cfs 0.922 af
Outflow=9.10 cfs 0.752 af

Pond 2P: LAND DEPRESSION Peak Elev=98.80' Storage=7,470 cf Inflow=3.71 cfs 0.299 af
Outflow=1.57 cfs 0.153 af

Link DP1: DEDHAM ST CB Inflow=1.57 cfs 0.153 af
Primary=1.57 cfs 0.153 af

Link DP2: 2ND ST CB Inflow=13.15 cfs 1.447 af
Primary=13.15 cfs 1.447 af

Link DP3: FLOODPLAIN OVERFLOW Inflow=6.08 cfs 0.536 af
Primary=6.08 cfs 0.536 af

Total Runoff Area = 4.603 ac Runoff Volume = 2.453 af Average Runoff Depth = 6.40"
78.64% Pervious = 3.620 ac 21.36% Impervious = 0.983 ac

Summary for Subcatchment E1: Existing Site

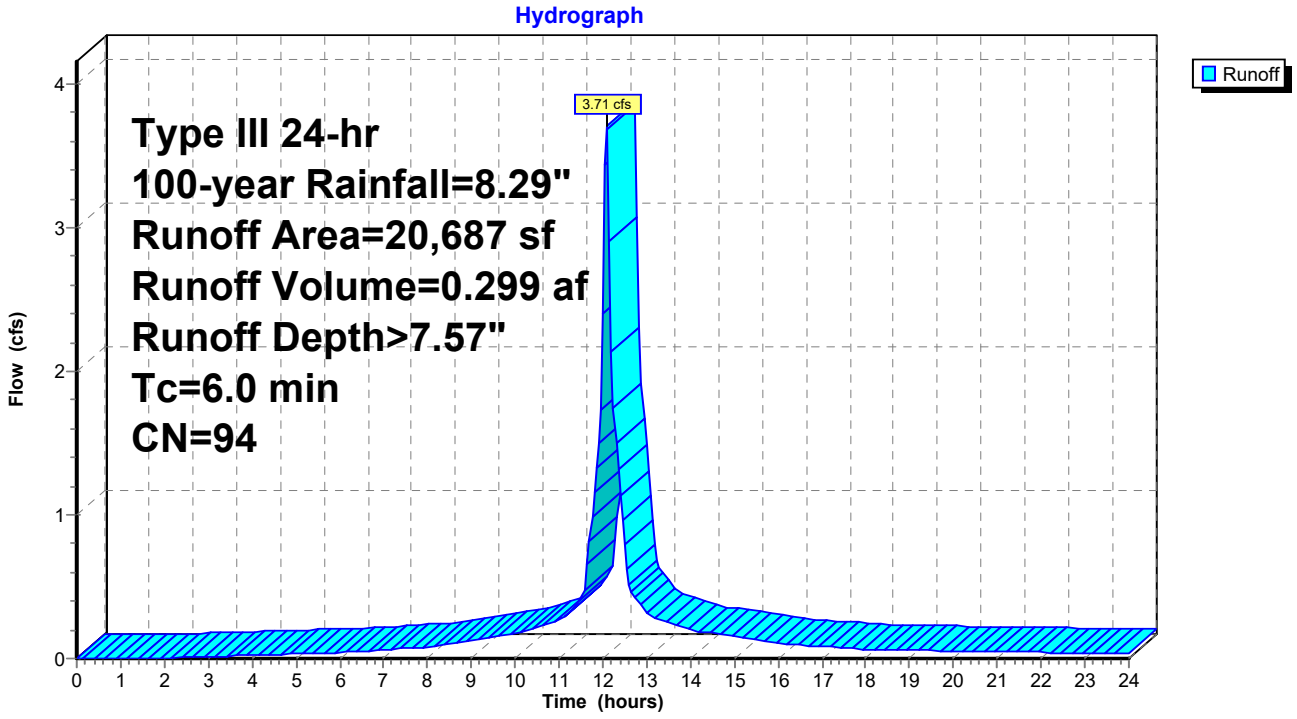
Runoff = 3.71 cfs @ 12.09 hrs, Volume= 0.299 af, Depth> 7.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
16,513	98	Paved roads w/curbs & sewers, HSG D
4,174	80	>75% Grass cover, Good, HSG D
20,687	94	Weighted Average
4,174		20.18% Pervious Area
16,513		79.82% Impervious Area

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

Subcatchment E1: Existing Site



Summary for Subcatchment E2A: PAVEMENT

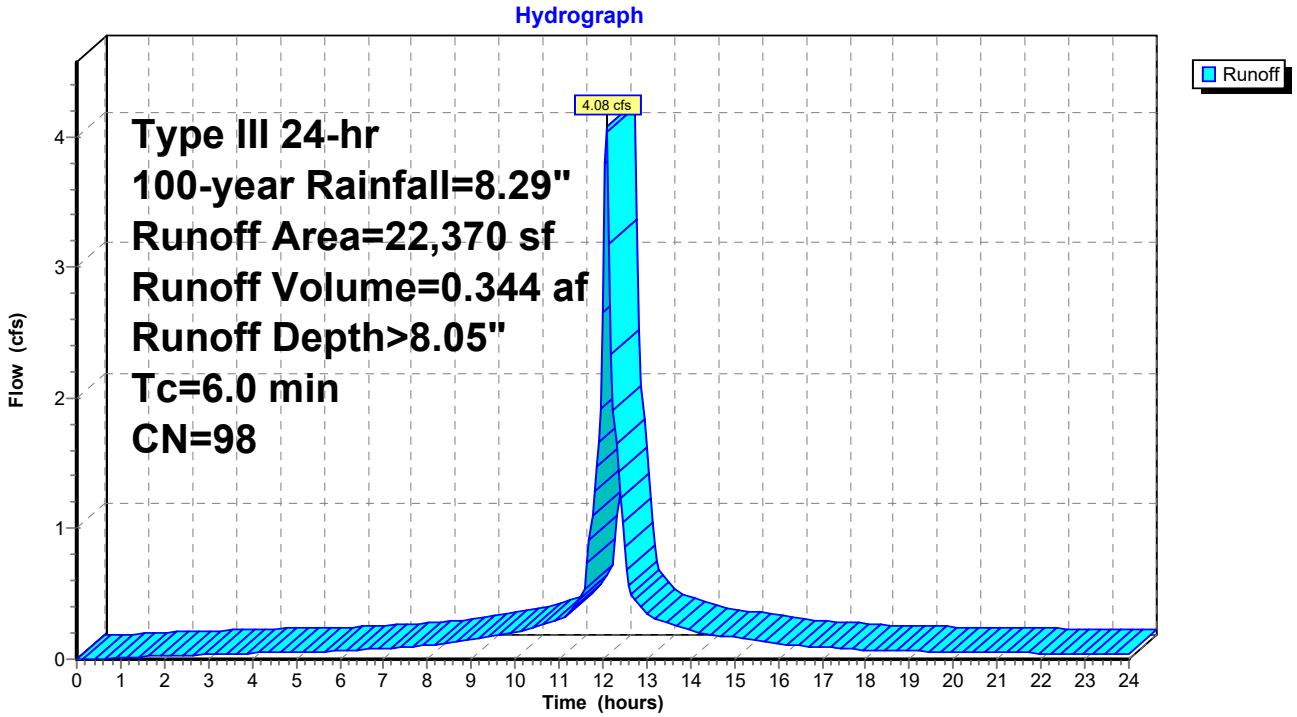
Runoff = 4.08 cfs @ 12.09 hrs, Volume= 0.344 af, Depth> 8.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
22,370	98	Paved parking, HSG D
22,370		100.00% Impervious Area

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

Subcatchment E2A: PAVEMENT



Summary for Subcatchment E2B: Existing Site

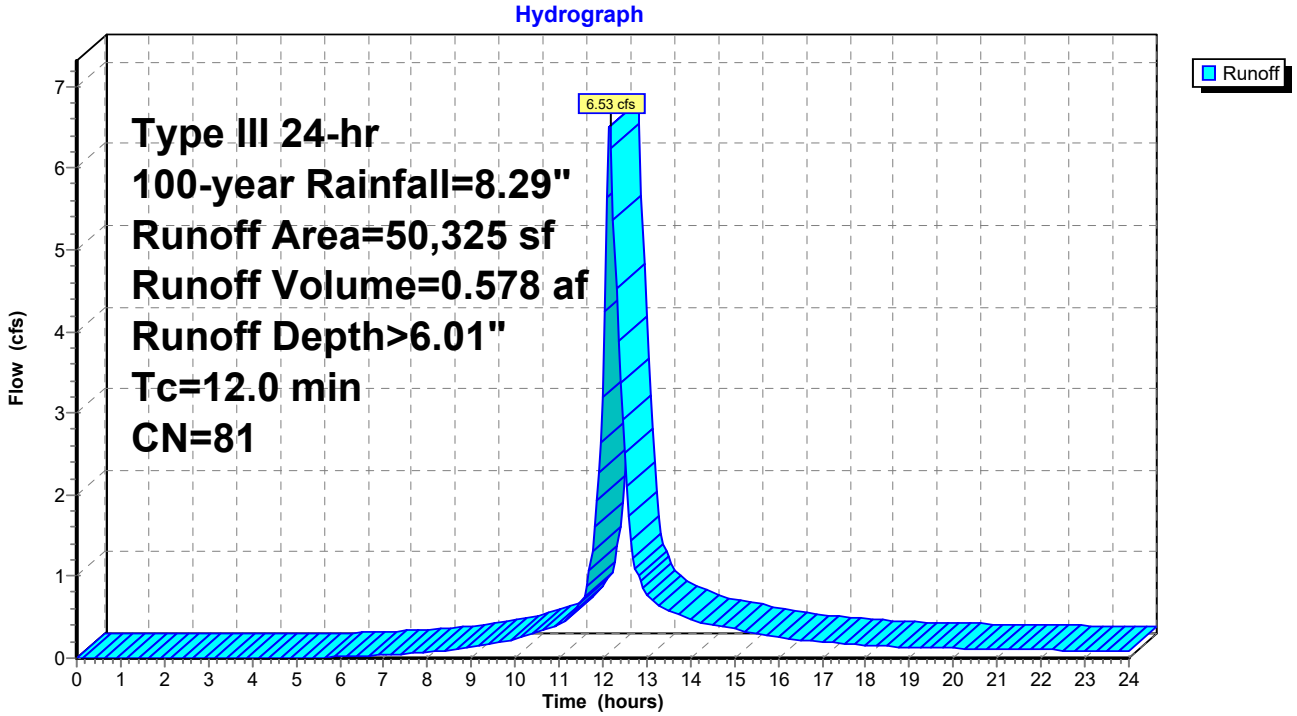
Runoff = 6.53 cfs @ 12.16 hrs, Volume= 0.578 af, Depth> 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
3,323	96	Gravel surface, HSG D
47,002	80	>75% Grass cover, Good, HSG D
50,325	81	Weighted Average
50,325		100.00% Pervious Area

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

Subcatchment E2B: Existing Site



Summary for Subcatchment E2C: Existing Site

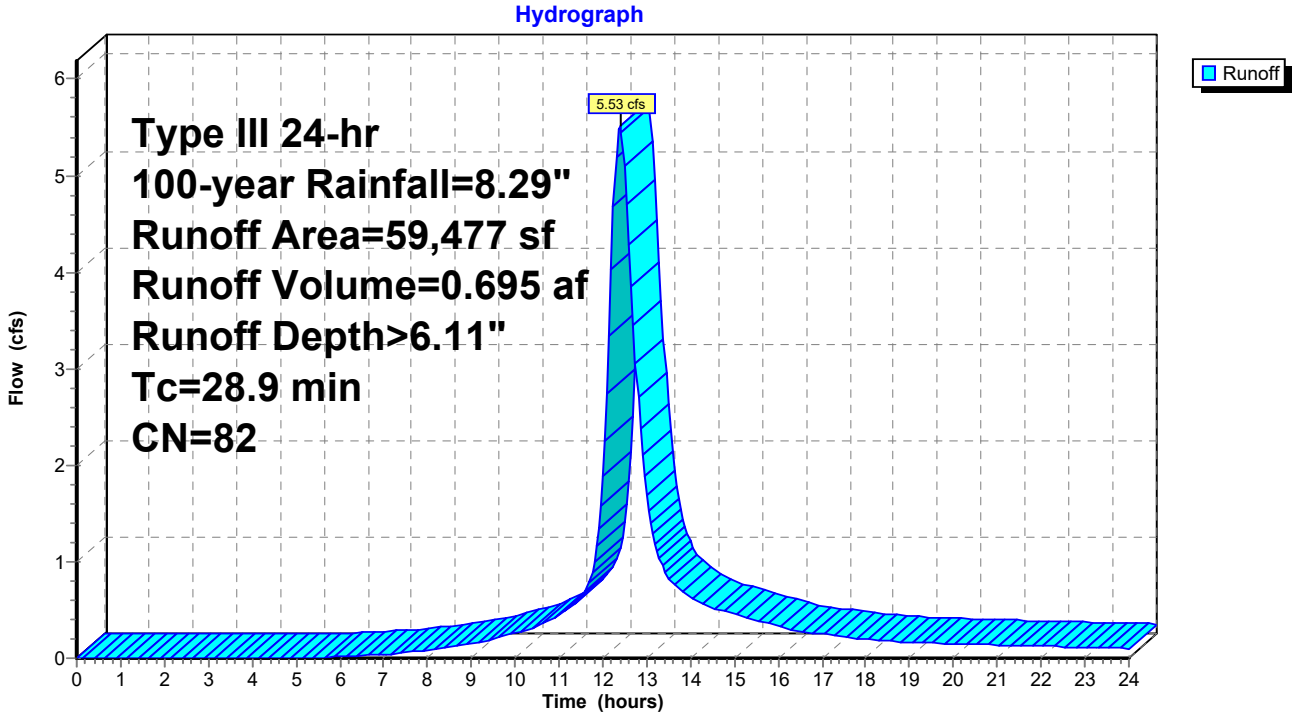
Runoff = 5.53 cfs @ 12.39 hrs, Volume= 0.695 af, Depth> 6.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
3,935	98	Paved parking, HSG D
2,930	96	Gravel surface, HSG D
52,612	80	>75% Grass cover, Good, HSG D
59,477	82	Weighted Average
55,542		93.38% Pervious Area
3,935		6.62% Impervious Area

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

Subcatchment E2C: Existing Site



Summary for Subcatchment E3: Existing Site

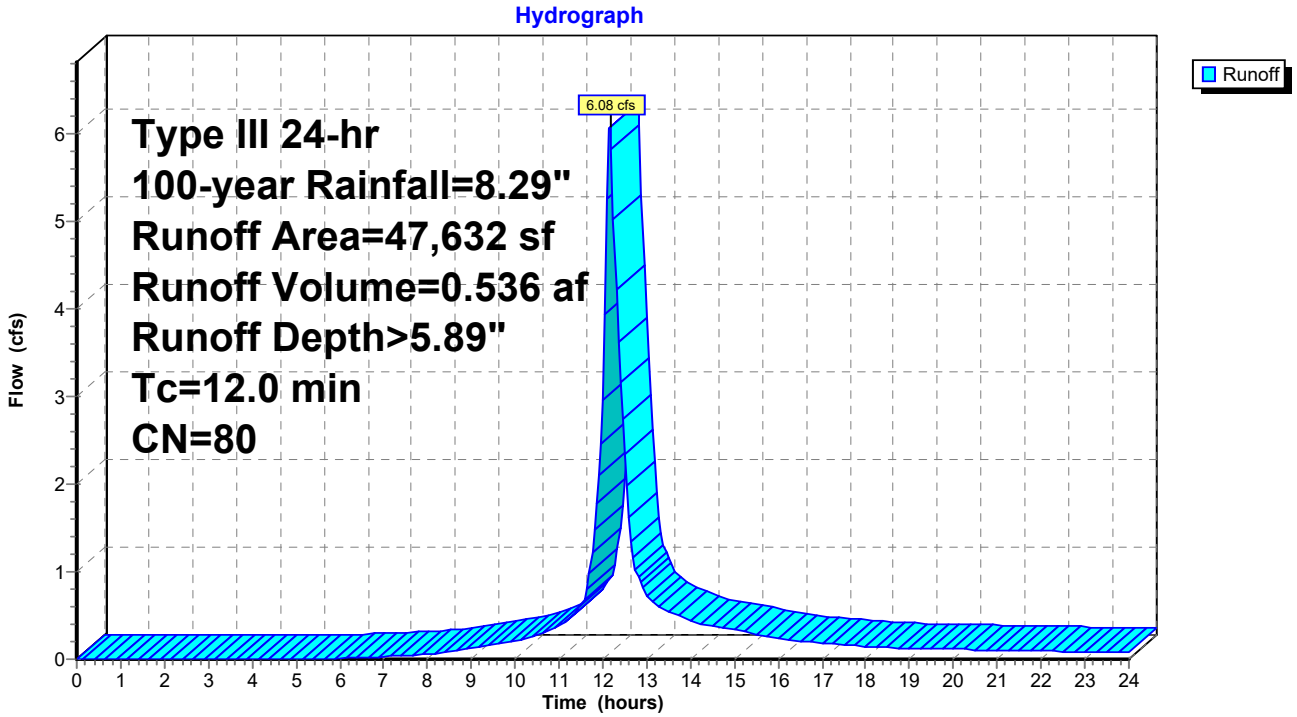
Runoff = 6.08 cfs @ 12.16 hrs, Volume= 0.536 af, Depth> 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
47,632	80	>75% Grass cover, Good, HSG D
47,632		100.00% Pervious Area

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

Subcatchment E3: Existing Site



Summary for Pond 1P: LAND DEPRESSION

Inflow Area = 1.669 ac, 30.77% Impervious, Inflow Depth > 6.63" for 100-year event
Inflow = 9.89 cfs @ 12.12 hrs, Volume= 0.922 af
Outflow = 9.10 cfs @ 12.18 hrs, Volume= 0.752 af, Atten= 8%, Lag= 3.6 min
Primary = 9.10 cfs @ 12.18 hrs, Volume= 0.752 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 97.87' @ 12.18 hrs Surf.Area= 30,021 sf Storage= 12,864 cf

Plug-Flow detention time= 154.4 min calculated for 0.751 af (81% of inflow)
Center-of-Mass det. time= 82.9 min (863.0 - 780.0)

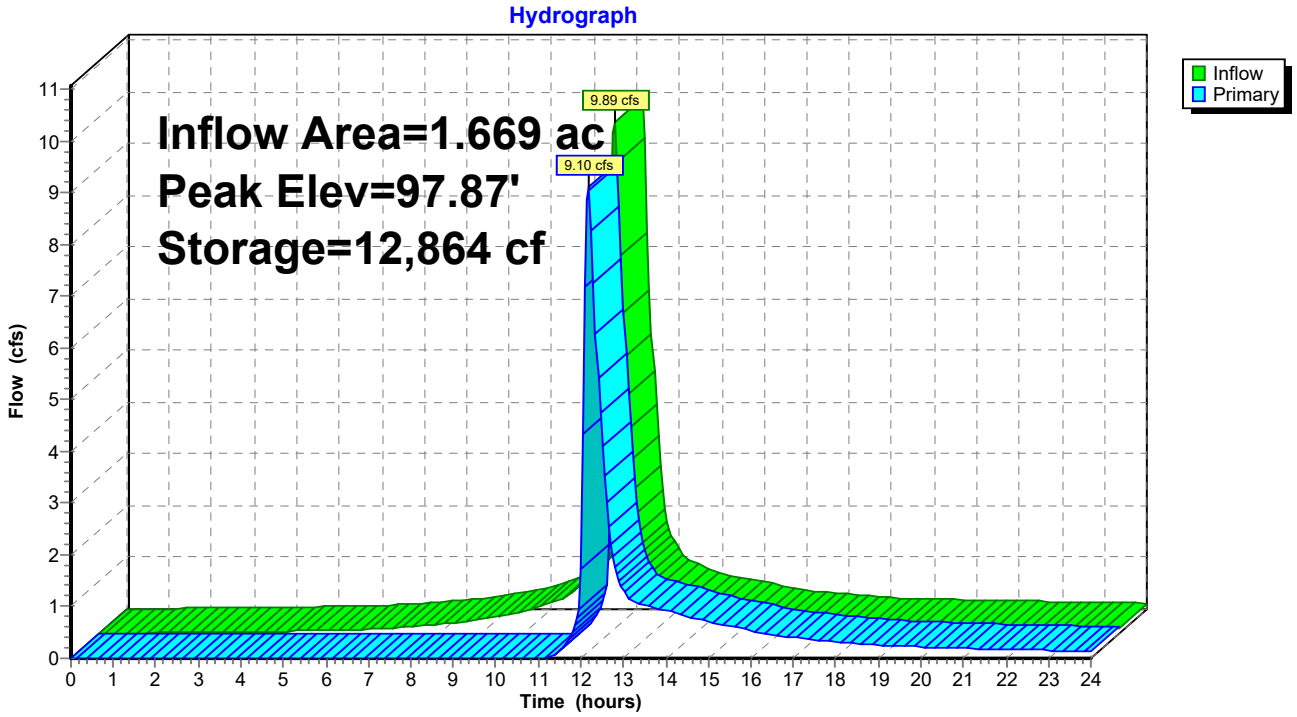
Volume	Invert	Avail.Storage	Storage Description
#1	96.60'	17,245 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
96.60	100	40.0	0	0	100
97.00	3,692	275.0	587	587	5,991
97.50	14,310	498.0	4,212	4,798	19,710
97.80	27,529	620.0	6,169	10,967	30,565
98.00	35,418	730.0	6,278	17,245	42,383

Device	Routing	Invert	Outlet Devices
#1	Primary	97.60'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	97.80'	**172.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=8.96 cfs @ 12.18 hrs HW=97.87' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.66 cfs @ 1.25 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 7.30 cfs @ 0.65 fps)

Pond 1P: LAND DEPRESSION



Summary for Pond 2P: LAND DEPRESSION

[93] Warning: Storage range exceeded by 0.06'

Inflow Area = 0.475 ac, 79.82% Impervious, Inflow Depth > 7.57" for 100-year event
Inflow = 3.71 cfs @ 12.09 hrs, Volume= 0.299 af
Outflow = 1.57 cfs @ 12.32 hrs, Volume= 0.153 af, Atten= 58%, Lag= 13.8 min
Primary = 1.57 cfs @ 12.32 hrs, Volume= 0.153 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 98.80' @ 12.32 hrs Surf.Area= 13,078 sf Storage= 7,470 cf

Plug-Flow detention time= 270.8 min calculated for 0.153 af (51% of inflow)
Center-of-Mass det. time= 151.0 min (911.1 - 760.1)

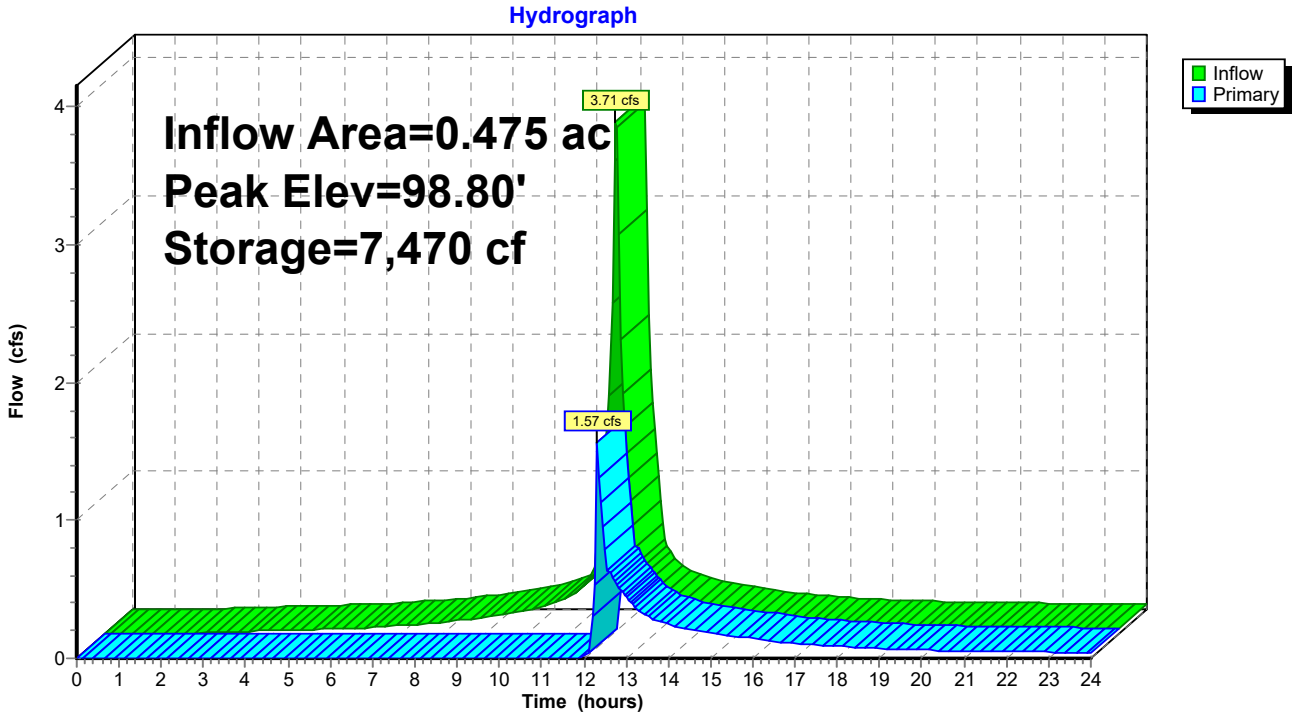
Volume	Invert	Avail.Storage	Storage Description
#1	97.11'	7,470 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.11	18	15.0	0	0	18
98.00	4,261	310.0	1,352	1,352	7,649
98.74	13,078	467.0	6,118	7,470	17,361

Device	Routing	Invert	Outlet Devices
#1	Primary	98.63'	**5.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	98.70'	**11.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.44 cfs @ 12.32 hrs HW=98.79' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.75 cfs @ 0.95 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.69 cfs @ 0.71 fps)

Pond 2P: LAND DEPRESSION

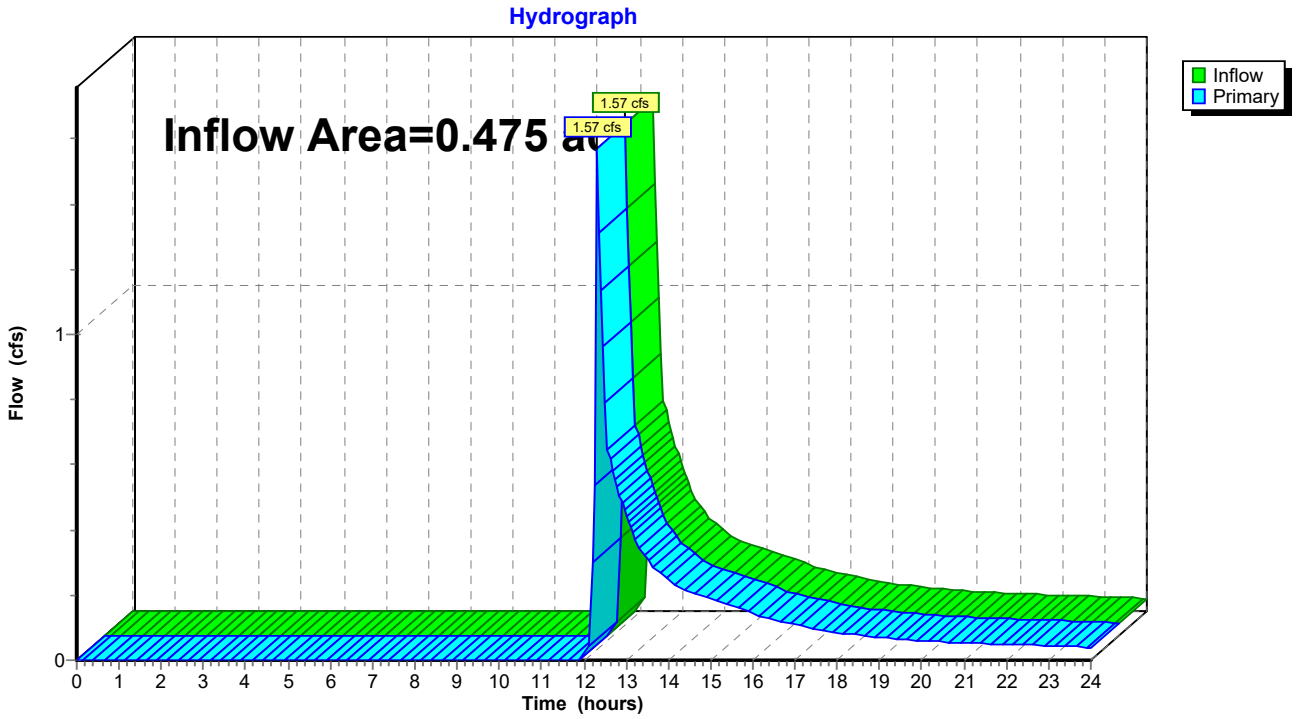


Summary for Link DP1: DEDHAM ST CB

Inflow Area = 0.475 ac, 79.82% Impervious, Inflow Depth > 3.87" for 100-year event
Inflow = 1.57 cfs @ 12.32 hrs, Volume= 0.153 af
Primary = 1.57 cfs @ 12.32 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP1: DEDHAM ST CB

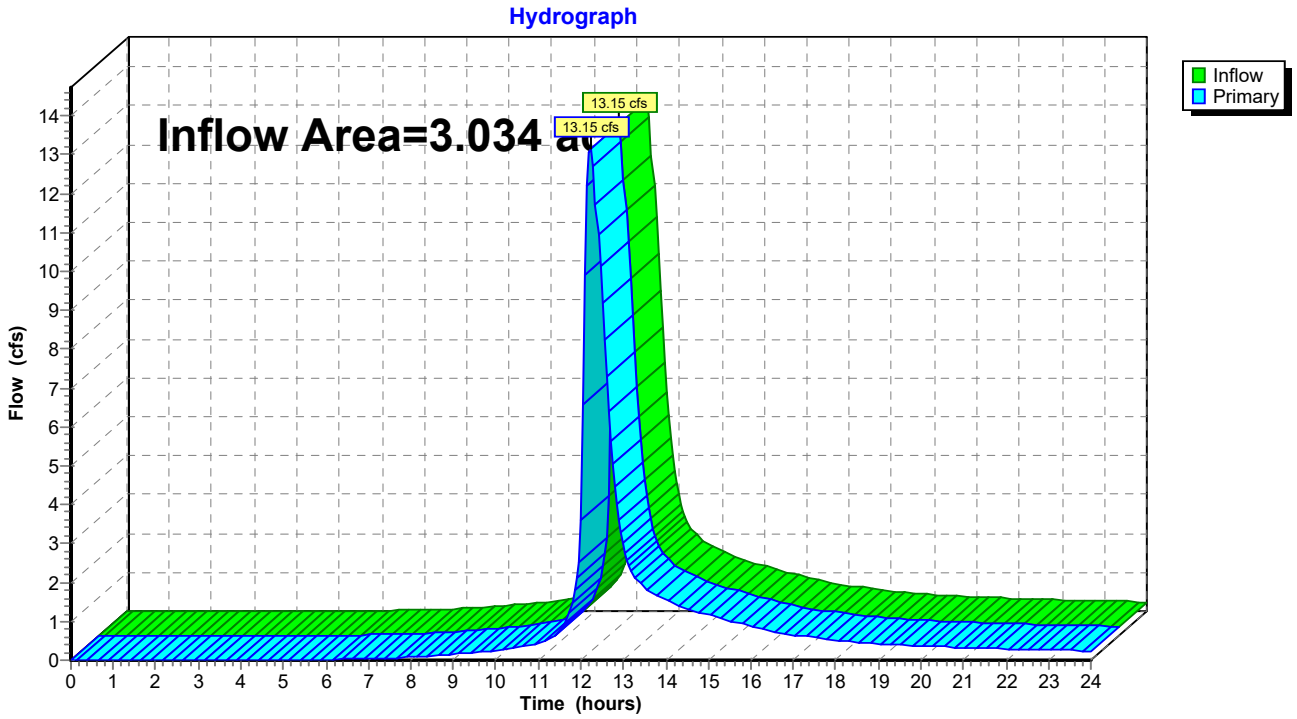


Summary for Link DP2: 2ND ST CB

Inflow Area = 3.034 ac, 19.90% Impervious, Inflow Depth > 5.72" for 100-year event
Inflow = 13.15 cfs @ 12.22 hrs, Volume= 1.447 af
Primary = 13.15 cfs @ 12.22 hrs, Volume= 1.447 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP2: 2ND ST CB

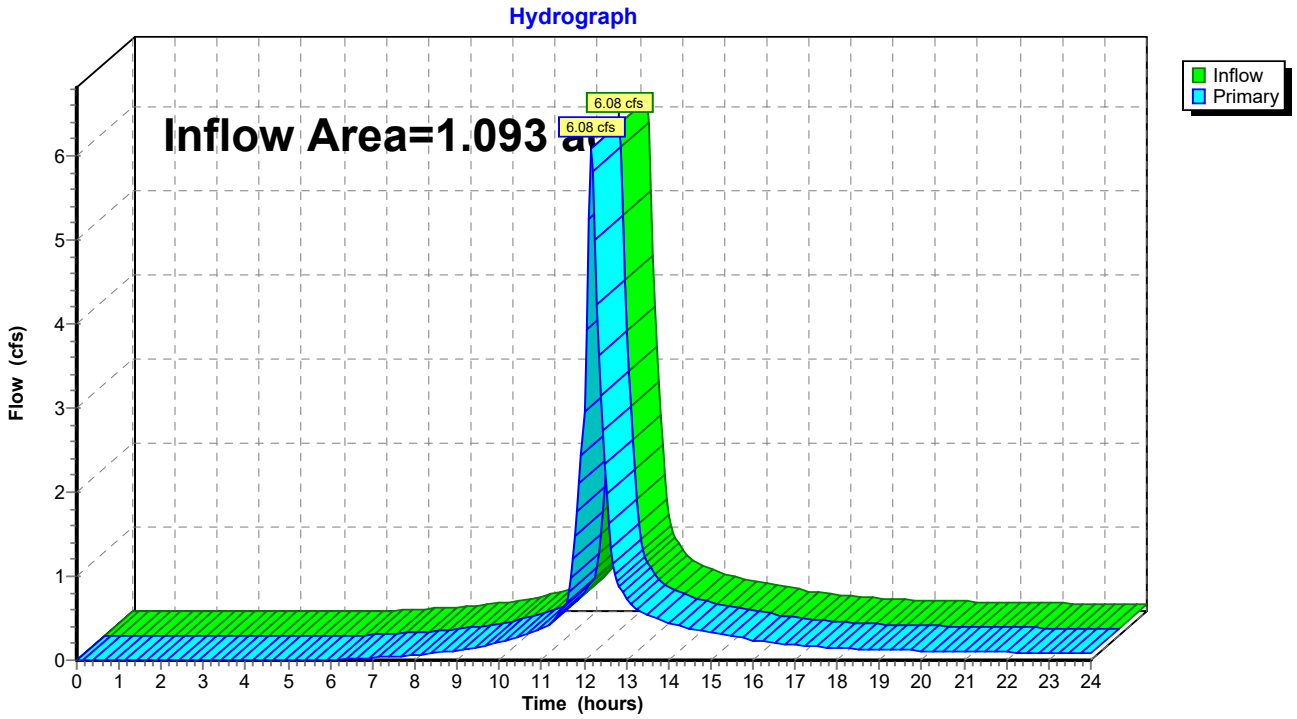


Summary for Link DP3: FLOODPLAIN OVERFLOW

Inflow Area = 1.093 ac, 0.00% Impervious, Inflow Depth > 5.89" for 100-year event
Inflow = 6.08 cfs @ 12.16 hrs, Volume= 0.536 af
Primary = 6.08 cfs @ 12.16 hrs, Volume= 0.536 af, Atten= 0%, Lag= 0.0 min

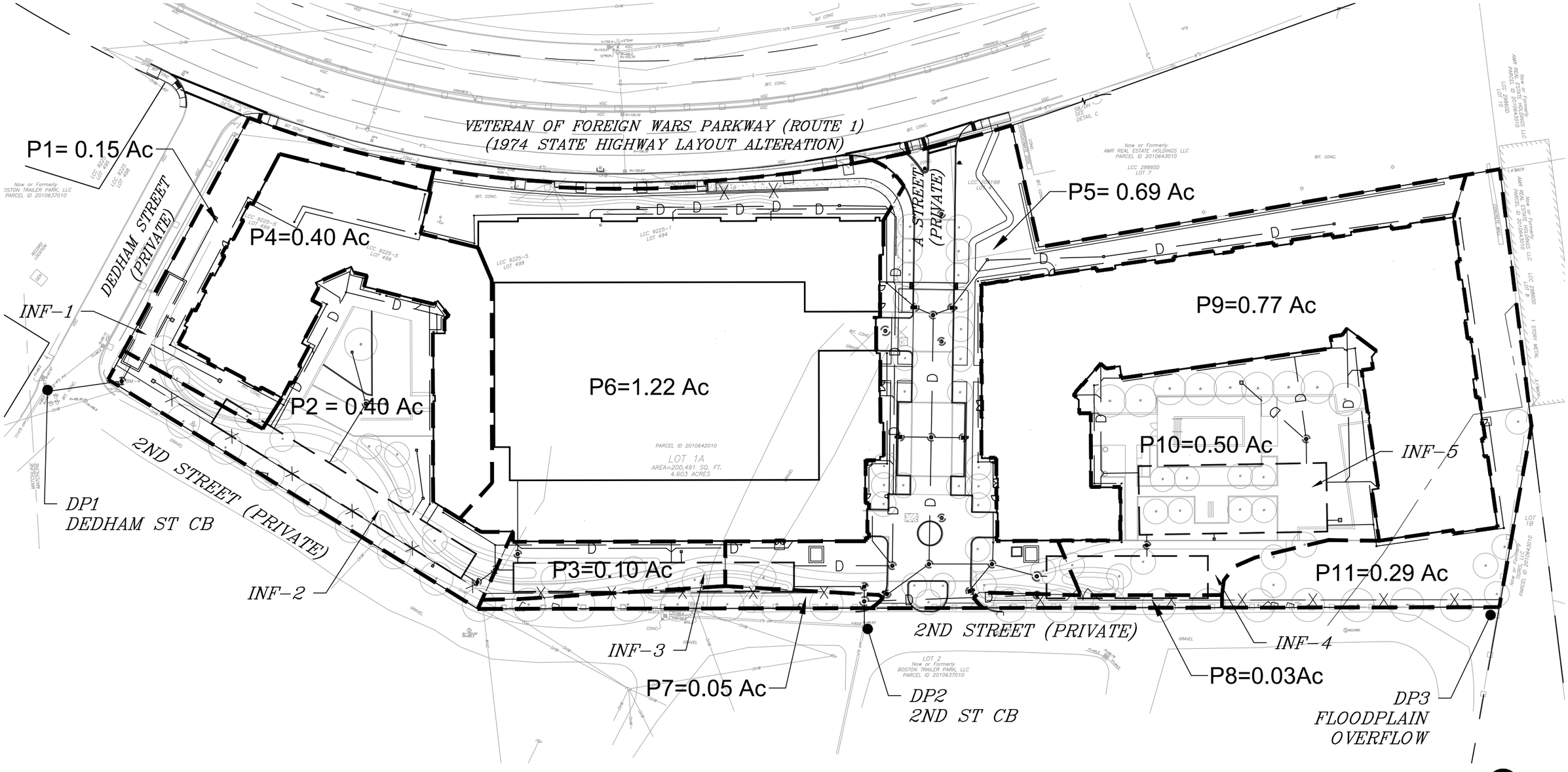
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link DP3: FLOODPLAIN OVERFLOW



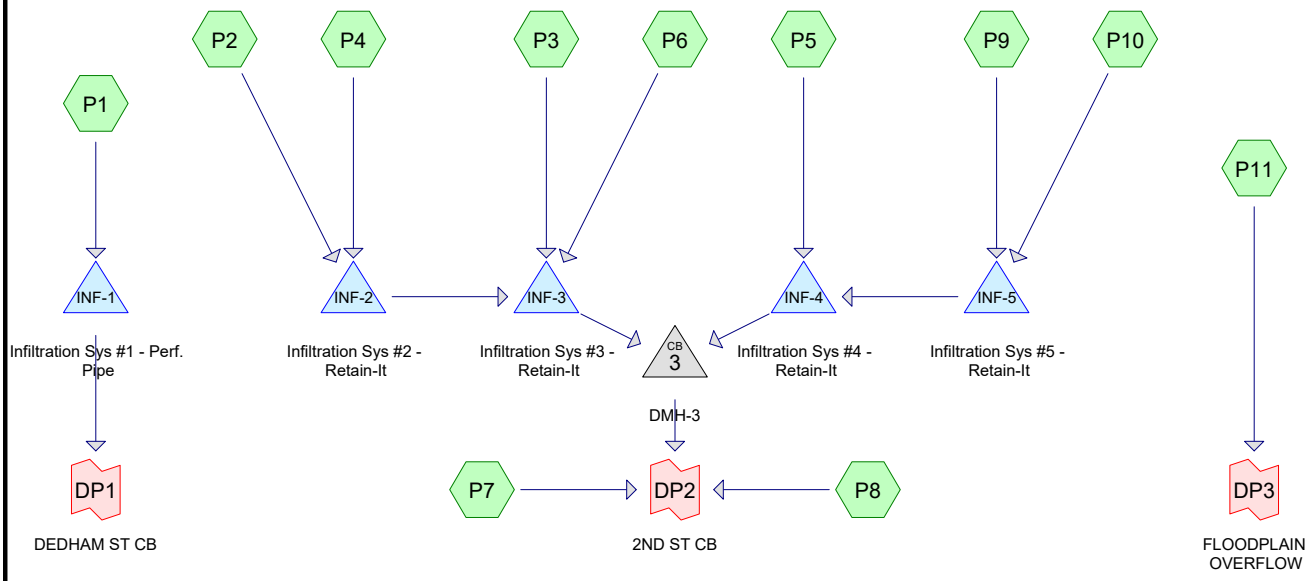
Appendix C:
Post-Construction Hydrology

Figure 2 ***POST DEVELOPMENT HYDROLOGY***



3/11/2019 L:\17163\Current\CUTSHEET\HYDROLOGY new.dwg
Jay Carroll

Approximate Scale: 1" = 60'-0"
Date: 2-28-2019



Subcat Reach Pond Link

Routing Diagram for HydroCAD_Post

Prepared by {enter your company name here}, Printed 3/11/2019

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP1: Runoff Area=6,924 sf 0.00% Impervious Runoff Depth>1.26"
Flow Length=200' Tc=11.9 min CN=76 Runoff=0.19 cfs 0.017 af

SubcatchmentP10: Runoff Area=21,889 sf 34.39% Impervious Runoff Depth>2.05"
Tc=6.0 min CN=87 Runoff=1.21 cfs 0.086 af

SubcatchmentP11: Runoff Area=12,600 sf 0.00% Impervious Runoff Depth>1.14"
Tc=6.0 min CN=74 Runoff=0.37 cfs 0.028 af

SubcatchmentP2: Runoff Area=17,496 sf 14.09% Impervious Runoff Depth>1.46"
Tc=6.0 min CN=79 Runoff=0.68 cfs 0.049 af

SubcatchmentP3: Runoff Area=3,391 sf 0.00% Impervious Runoff Depth>1.46"
Tc=6.0 min CN=79 Runoff=0.13 cfs 0.009 af

SubcatchmentP4: Runoff Area=17,366 sf 100.00% Impervious Runoff Depth>3.12"
Tc=6.0 min CN=98 Runoff=1.30 cfs 0.104 af

SubcatchmentP5: Runoff Area=30,376 sf 44.36% Impervious Runoff Depth>2.14"
Flow Length=380' Tc=11.1 min CN=88 Runoff=1.47 cfs 0.124 af

SubcatchmentP6: Runoff Area=53,169 sf 87.60% Impervious Runoff Depth>2.79"
Flow Length=564' Tc=16.3 min CN=95 Runoff=2.79 cfs 0.284 af

SubcatchmentP7: Runoff Area=2,338 sf 0.00% Impervious Runoff Depth>1.52"
Tc=6.0 min CN=80 Runoff=0.10 cfs 0.007 af

SubcatchmentP8: Runoff Area=1,182 sf 0.00% Impervious Runoff Depth>1.52"
Tc=6.0 min CN=80 Runoff=0.05 cfs 0.003 af

SubcatchmentP9: Runoff Area=33,650 sf 100.00% Impervious Runoff Depth>3.12"
Tc=6.0 min CN=98 Runoff=2.52 cfs 0.201 af

Pond 3: DMH-3 Peak Elev=94.56' Inflow=0.62 cfs 0.102 af
12.0" Round Culvert n=0.010 L=12.0' S=0.0050 '/' Outflow=0.62 cfs 0.102 af

Pond INF-1: Infiltration Sys #1 - Perf. Pipe Peak Elev=95.69' Storage=653 cf Inflow=0.19 cfs 0.017 af
Discarded=0.00 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.002 af

Pond INF-2: Infiltration Sys #2 - Retain-It Peak Elev=95.65' Storage=3,380 cf Inflow=1.98 cfs 0.153 af
Discarded=0.08 cfs 0.106 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.106 af

Pond INF-3: Infiltration Sys #3 - Retain-It Peak Elev=96.71' Storage=5,793 cf Inflow=2.87 cfs 0.294 af
Discarded=0.08 cfs 0.108 af Primary=0.62 cfs 0.102 af Outflow=0.70 cfs 0.210 af

Pond INF-4: Infiltration Sys #4 - Retain-It Peak Elev=94.78' Storage=3,038 cf Inflow=1.47 cfs 0.124 af
Discarded=0.06 cfs 0.076 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.076 af

Pond INF-5: Infiltration Sys #5 - Retain-It Peak Elev=95.06' Storage=6,990 cf Inflow=3.73 cfs 0.287 af
Discarded=0.12 cfs 0.167 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.167 af

Link DP1: DEDHAM ST CB Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link DP2: 2ND ST CB Inflow=0.64 cfs 0.112 af
Primary=0.64 cfs 0.112 af

Link DP3: FLOODPLAIN OVERFLOW Inflow=0.37 cfs 0.028 af
Primary=0.37 cfs 0.028 af

Total Runoff Area = 4.600 ac Runoff Volume = 0.912 af Average Runoff Depth = 2.38"
39.58% Pervious = 1.821 ac 60.42% Impervious = 2.779 ac

Summary for Subcatchment P1:

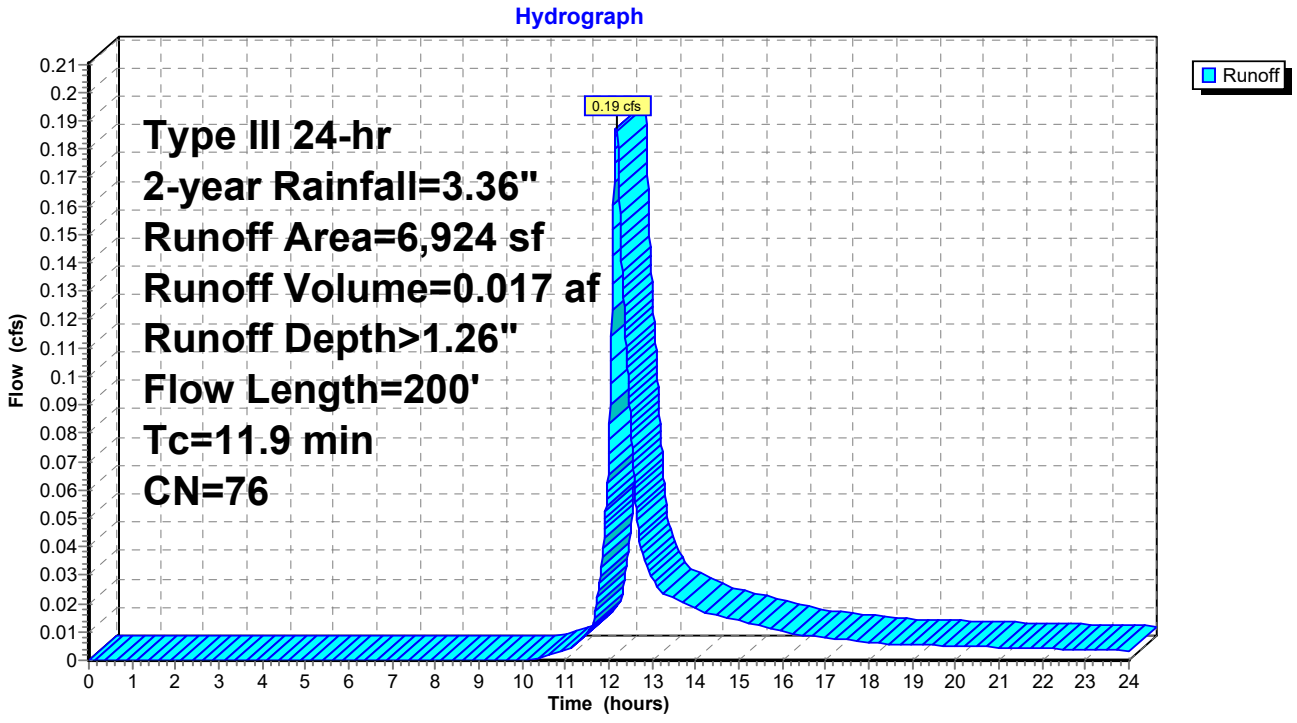
Runoff = 0.19 cfs @ 12.17 hrs, Volume= 0.017 af, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
6,400	74	>75% Grass cover, Good, HSG C
524	96	Gravel surface, HSG C
6,924	76	Weighted Average
6,924		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0130	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
0.4	44	0.0130	1.71		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
0.1	56	0.3330	8.66		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
11.9	200	Total			

Subcatchment P1:



Summary for Subcatchment P10:

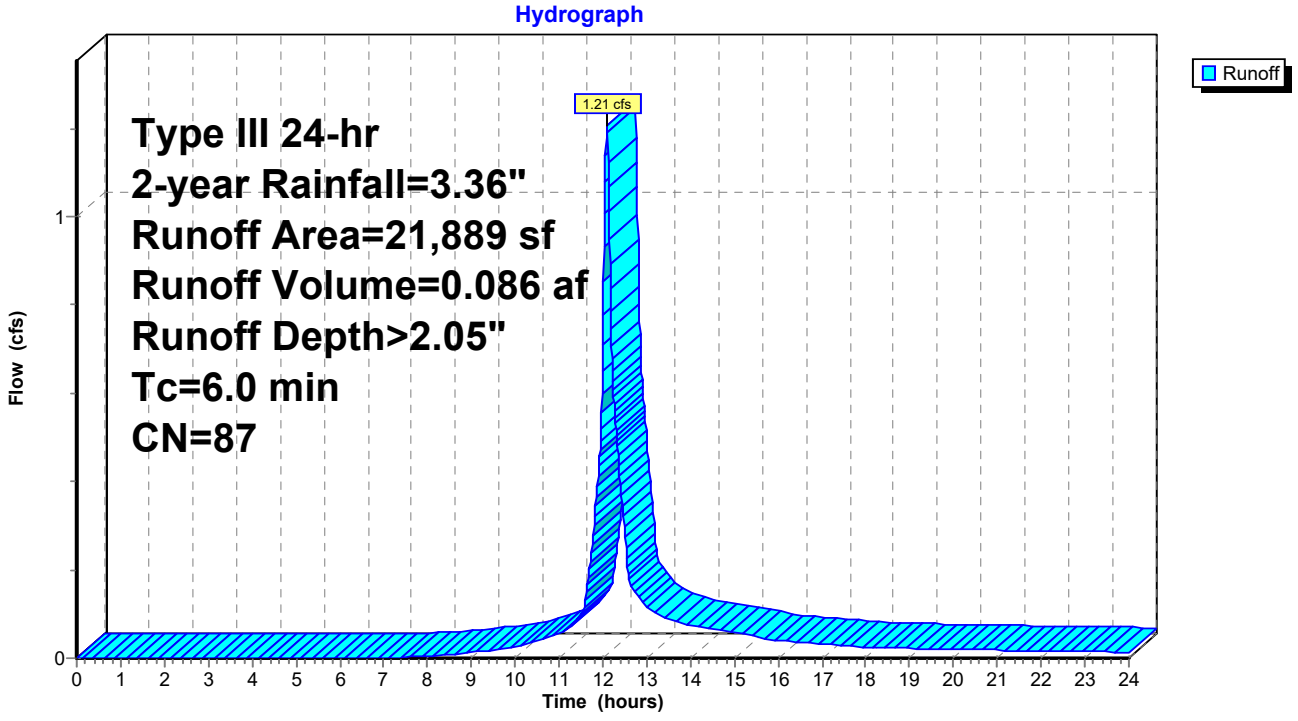
Runoff = 1.21 cfs @ 12.09 hrs, Volume= 0.086 af, Depth> 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

	Area (sf)	CN	Description
*	7,528	98	Patio Area
	13,700	80	>75% Grass cover, Good, HSG D
	661	96	Gravel surface, HSG C
	21,889	87	Weighted Average
	14,361		65.61% Pervious Area
	7,528		34.39% Impervious Area

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

Subcatchment P10:



Summary for Subcatchment P11:

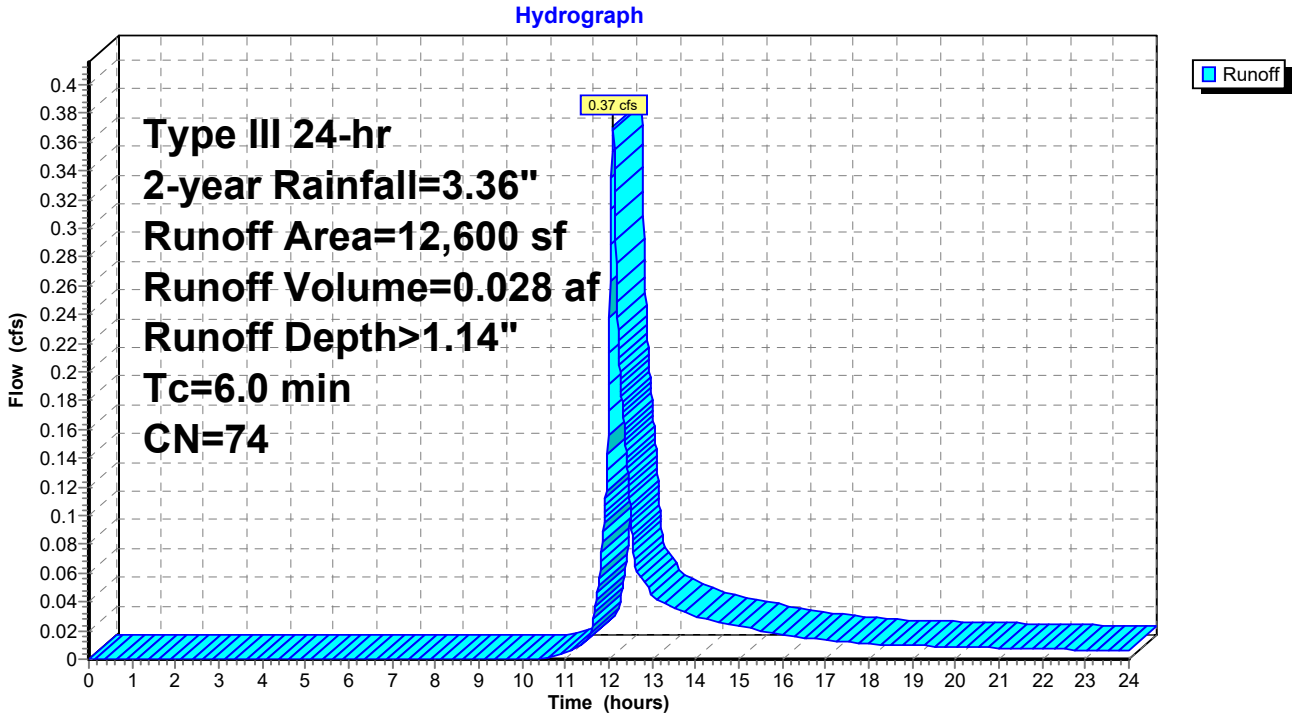
Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af, Depth> 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
12,600	74	>75% Grass cover, Good, HSG C
12,600		100.00% Pervious Area

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

Subcatchment P11:



Summary for Subcatchment P2:

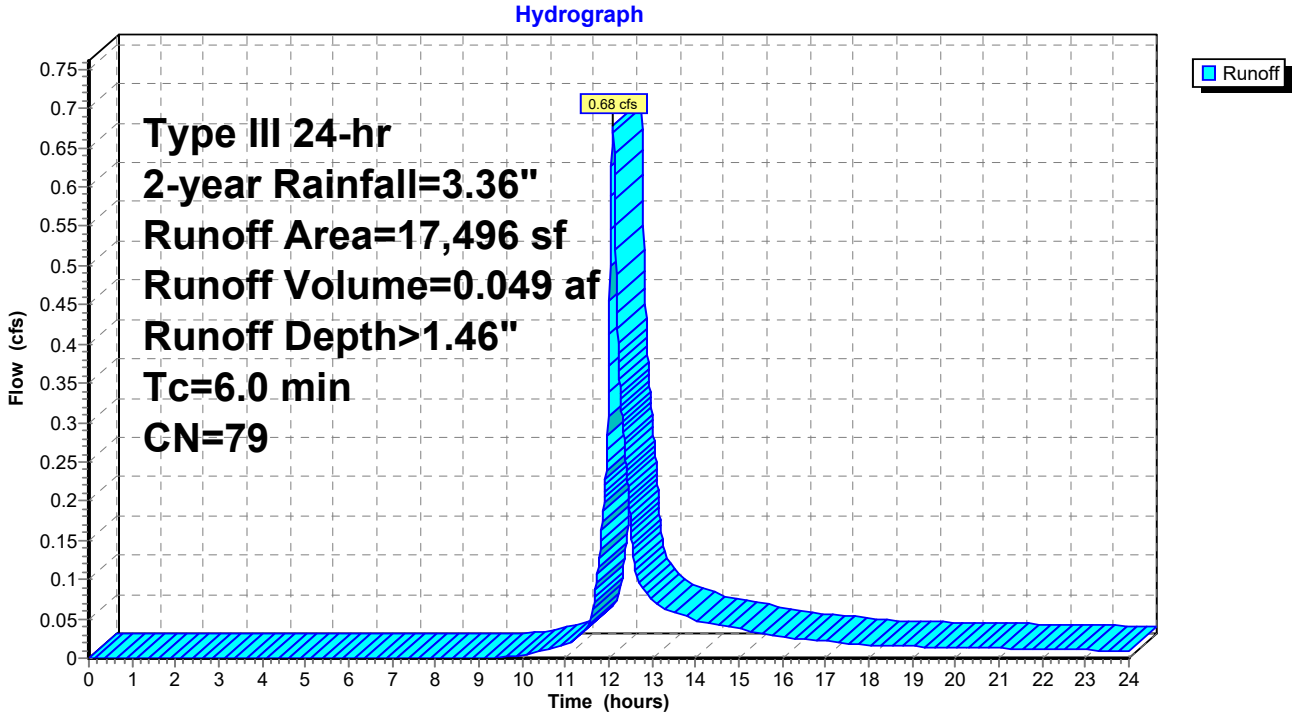
Runoff = 0.68 cfs @ 12.09 hrs, Volume= 0.049 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

	Area (sf)	CN	Description
*	2,466	98	Patio Area
	13,800	74	>75% Grass cover, Good, HSG C
*	1,230	96	Gravel Path Area
	17,496	79	Weighted Average
	15,030		85.91% Pervious Area
	2,466		14.09% Impervious Area

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

Subcatchment P2:



Summary for Subcatchment P3:

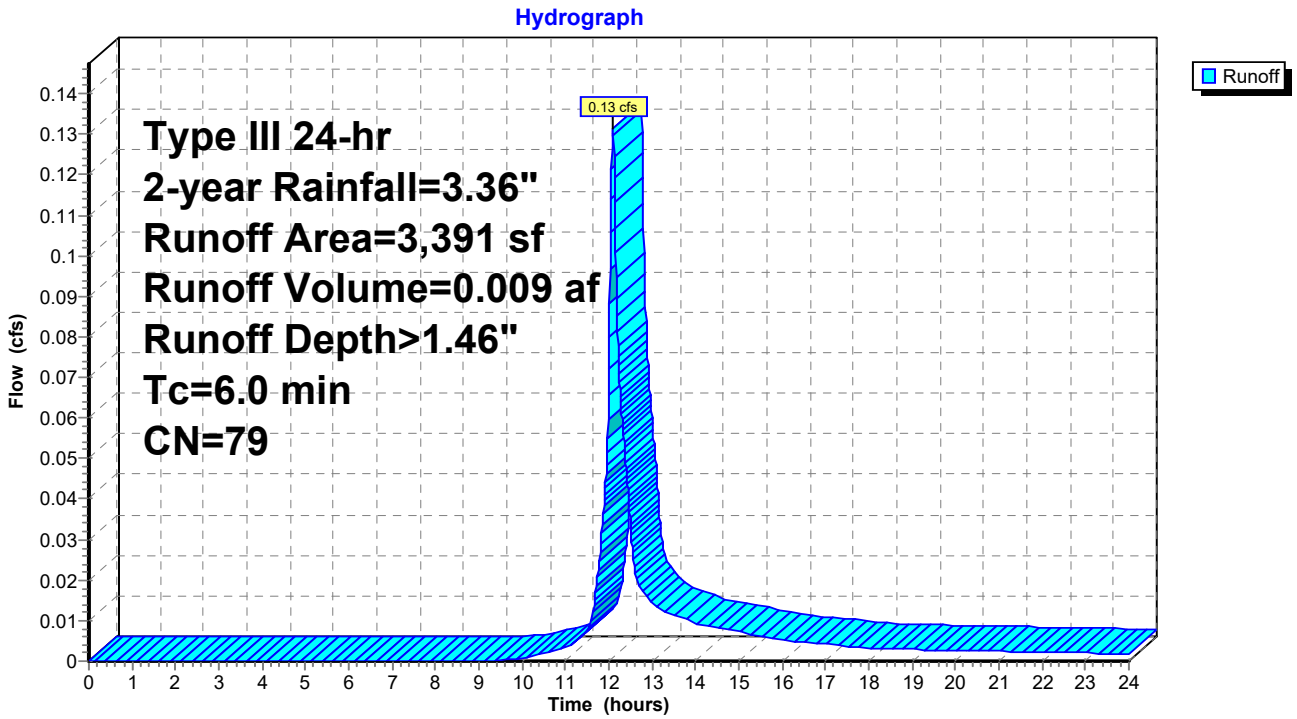
Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.009 af, Depth> 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

	Area (sf)	CN	Description
*	726	96	Gravel Path Area
	2,665	74	>75% Grass cover, Good, HSG C
	3,391	79	Weighted Average
	3,391		100.00% Pervious Area

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

Subcatchment P3:



Summary for Subcatchment P4:

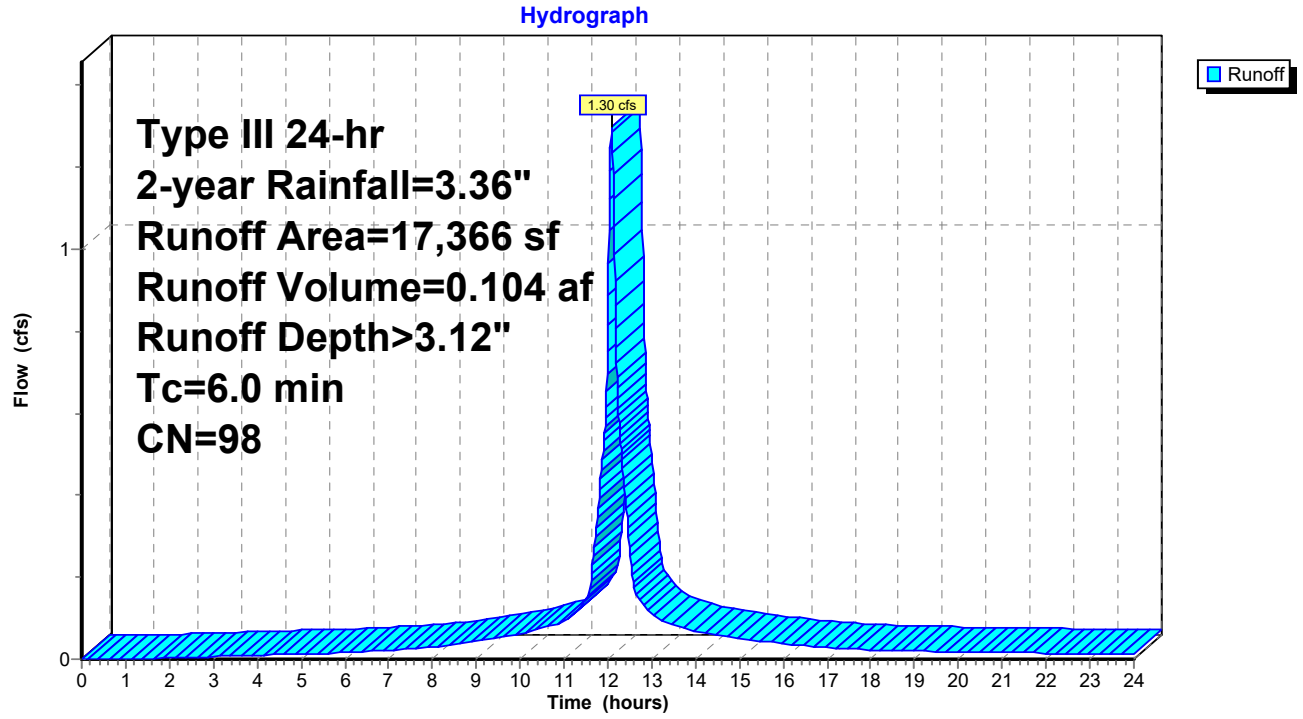
Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.104 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
17,366	98	Roofs, HSG C
17,366		100.00% Impervious Area

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

Subcatchment P4:



Summary for Subcatchment P5:

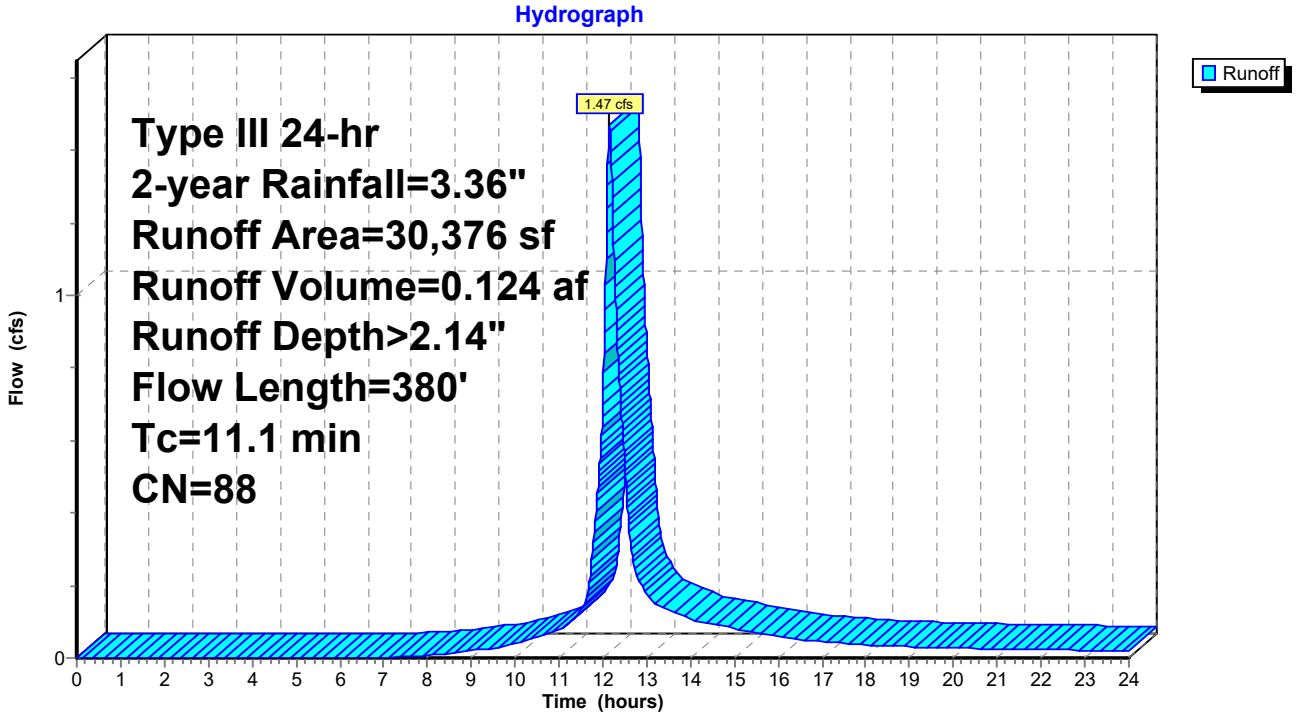
Runoff = 1.47 cfs @ 12.15 hrs, Volume= 0.124 af, Depth> 2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
13,476	98	Paved roads w/curbs & sewers, HSG D
16,900	80	>75% Grass cover, Good, HSG D
30,376	88	Weighted Average
16,900		55.64% Pervious Area
13,476		44.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	25	0.3300	0.41		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
8.9	65	0.0100	0.12		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
1.2	290	0.0050	4.17	3.28	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
11.1	380	Total			

Subcatchment P5:



Summary for Subcatchment P6:

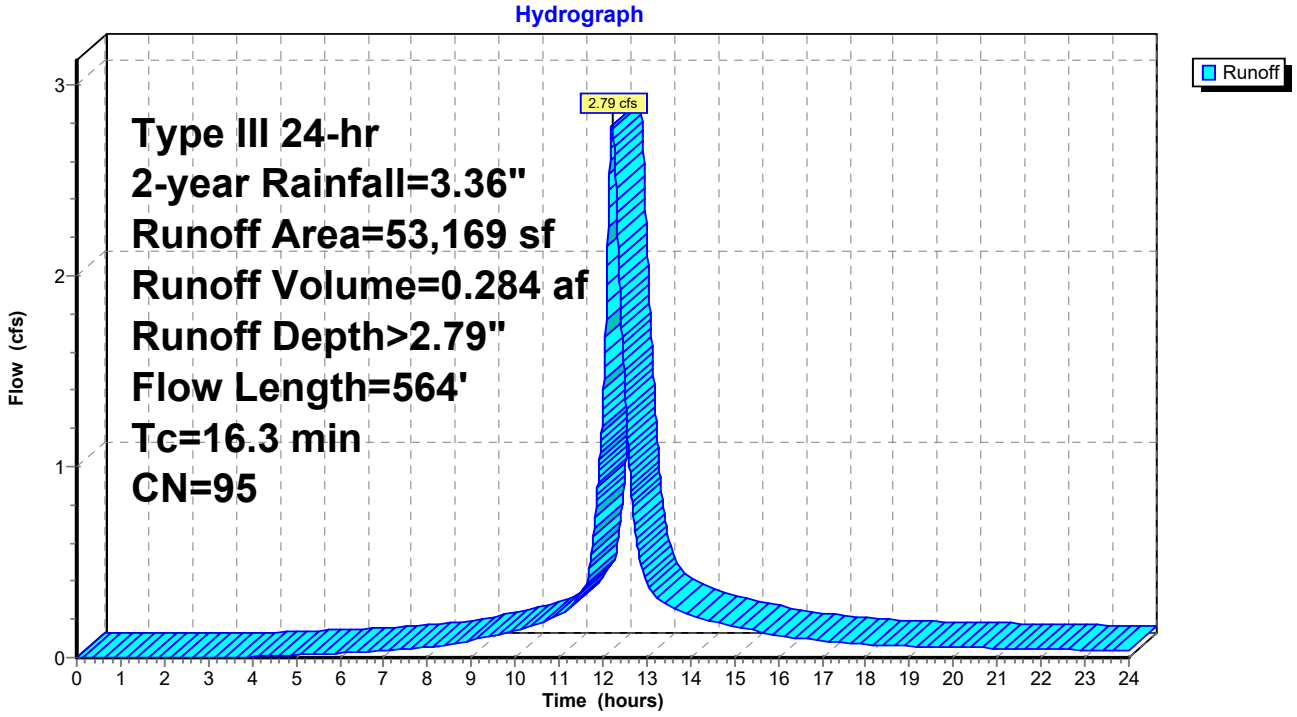
Runoff = 2.79 cfs @ 12.22 hrs, Volume= 0.284 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

	Area (sf)	CN	Description
	45,865	98	Roofs, HSG C
*	711	98	Conc Path
	6,593	74	>75% Grass cover, Good, HSG C
	53,169	95	Weighted Average
	6,593		12.40% Pervious Area
	46,576		87.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0090	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
0.4	34	0.0090	1.42		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
2.7	430	0.0050	2.63	0.52	**Pipe Channel, Pipe Channel Flow** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
16.3	564	Total			

Subcatchment P6:



Summary for Subcatchment P7:

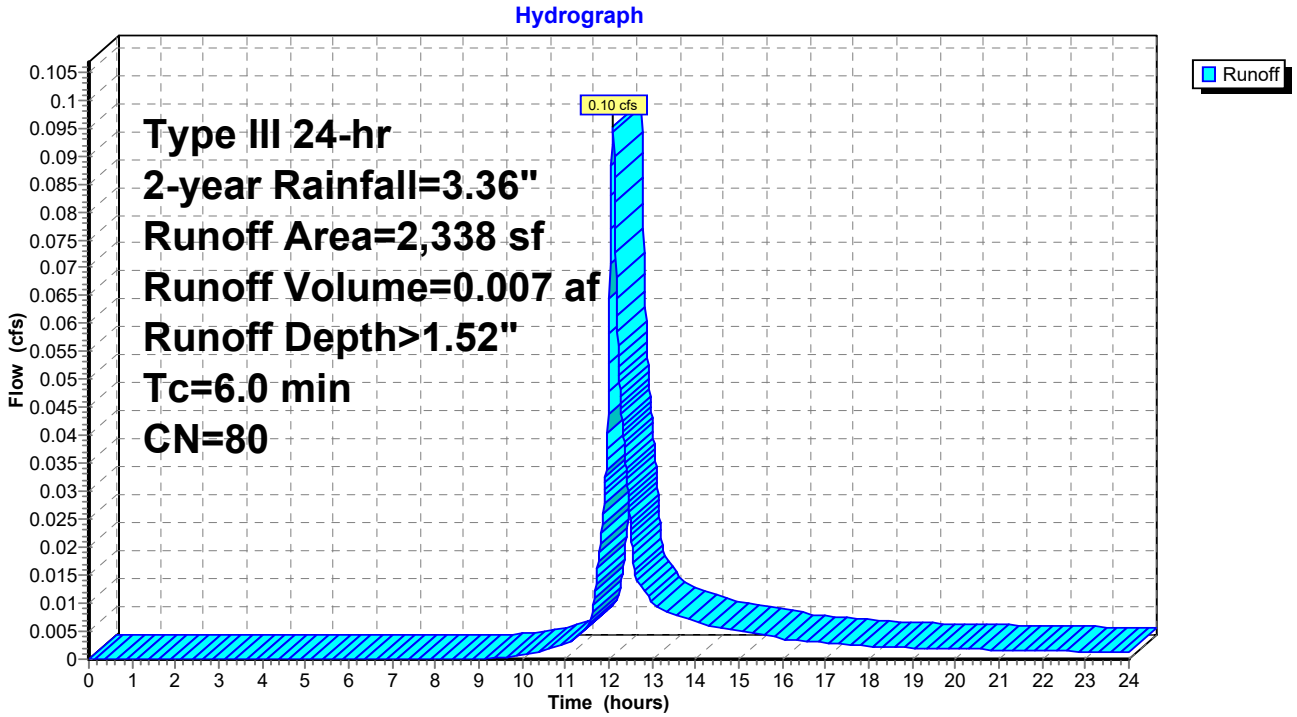
Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
2,338	80	>75% Grass cover, Good, HSG D
2,338		100.00% Pervious Area

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

Subcatchment P7:



Summary for Subcatchment P8:

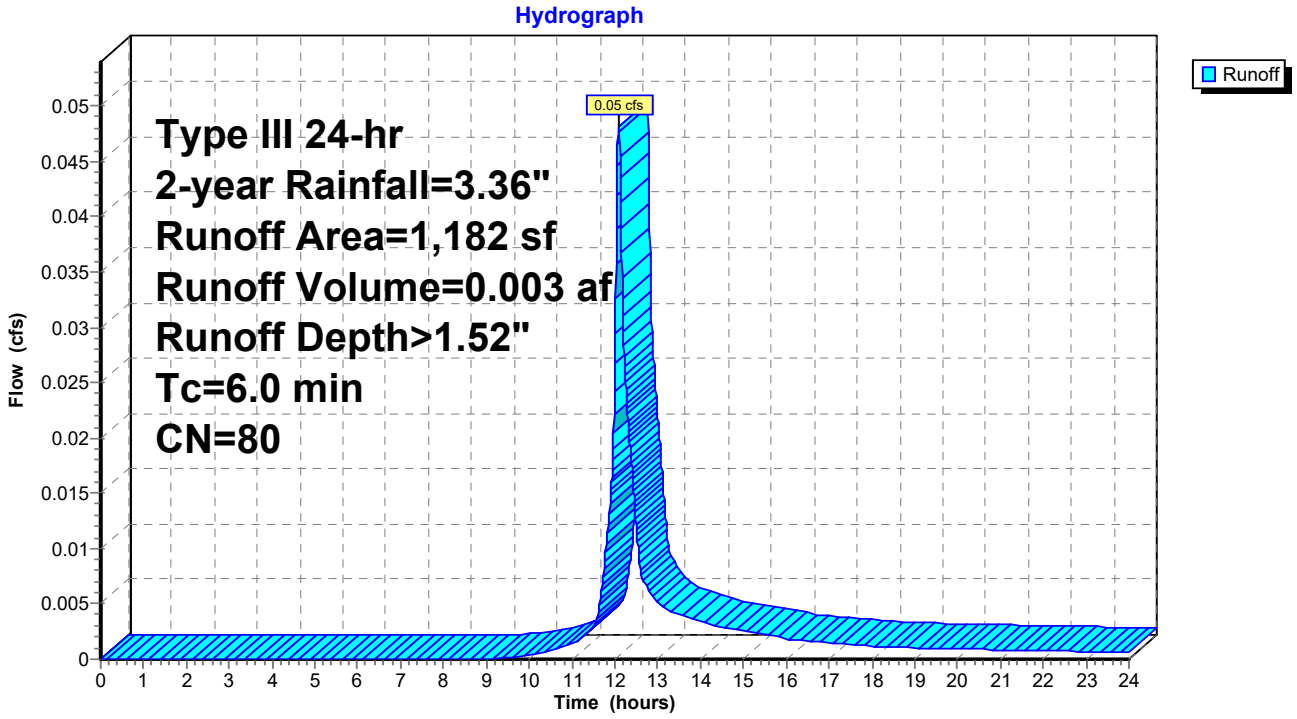
Runoff = 0.05 cfs @ 12.09 hrs, Volume= 0.003 af, Depth> 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
1,182	80	>75% Grass cover, Good, HSG D
1,182		100.00% Pervious Area

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

Subcatchment P8:



Summary for Subcatchment P9:

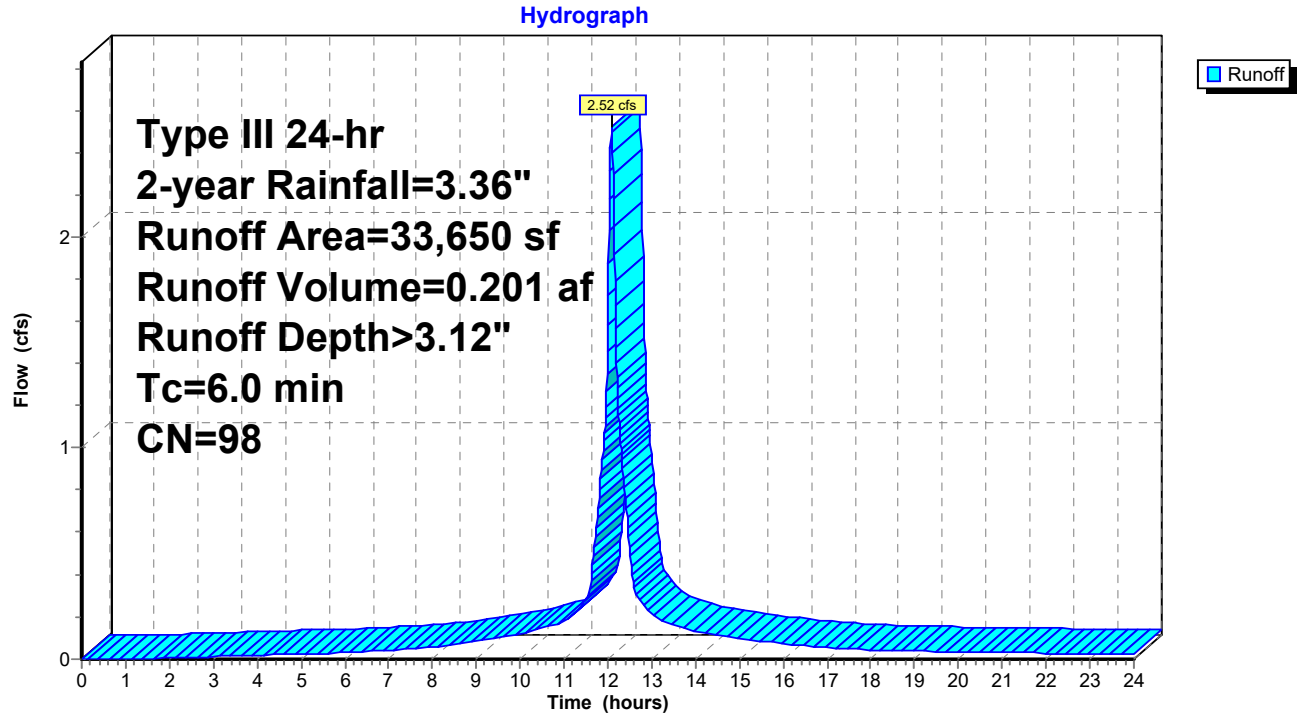
Runoff = 2.52 cfs @ 12.08 hrs, Volume= 0.201 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.36"

Area (sf)	CN	Description
33,650	98	Roofs, HSG A
33,650		100.00% Impervious Area

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

Subcatchment P9:



Summary for Pond 3: DMH-3

[57] Hint: Peaked at 94.56' (Flood elevation advised)
[79] Warning: Submerged Pond INF-3 Primary device # 1 INLET by 0.06'
[79] Warning: Submerged Pond INF-4 Primary device # 1 OUTLET by 0.06'

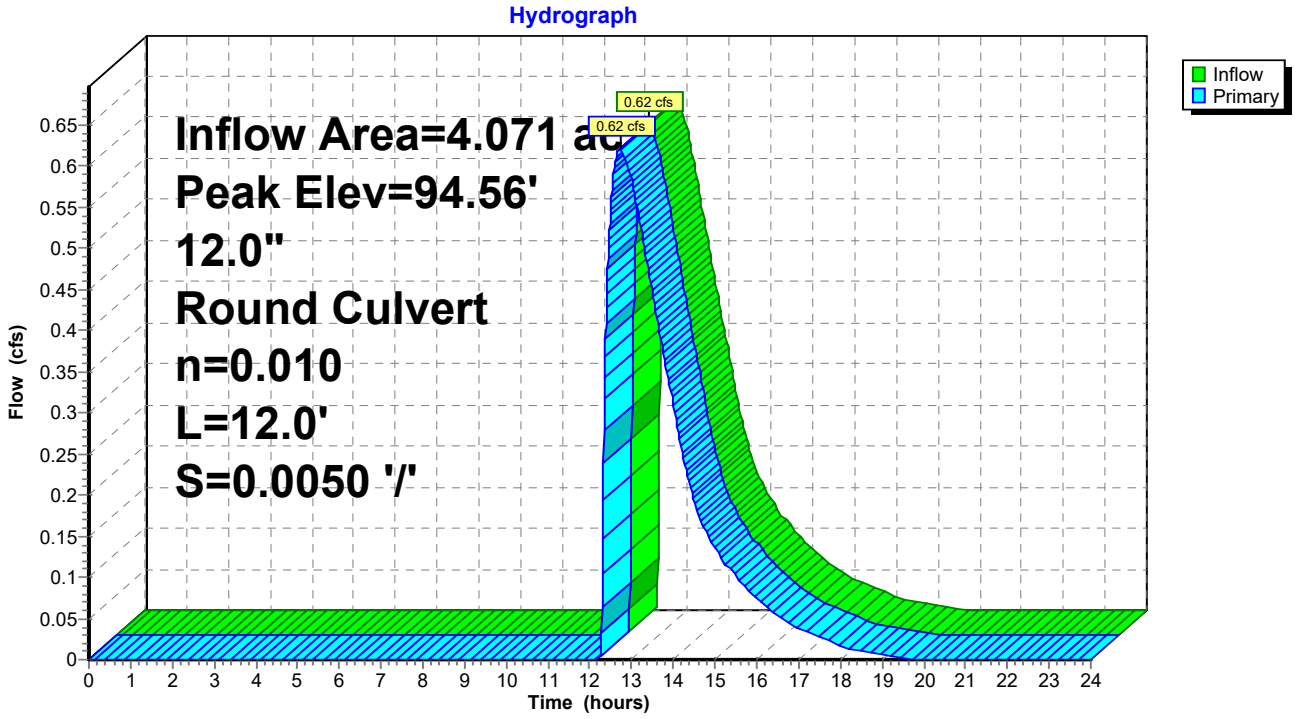
Inflow Area = 4.071 ac, 68.27% Impervious, Inflow Depth = 0.30" for 2-year event
Inflow = 0.62 cfs @ 12.72 hrs, Volume= 0.102 af
Outflow = 0.62 cfs @ 12.72 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 0.62 cfs @ 12.72 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 94.56' @ 12.72 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.06' / 94.00' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.72 hrs HW=94.56' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 0.62 cfs @ 2.33 fps)

Pond 3: DMH-3



Summary for Pond INF-1: Infiltration Sys #1 - Perf. Pipe

Inflow Area = 0.159 ac, 0.00% Impervious, Inflow Depth > 1.26" for 2-year event
Inflow = 0.19 cfs @ 12.17 hrs, Volume= 0.017 af
Outflow = 0.00 cfs @ 11.23 hrs, Volume= 0.002 af, Atten= 99%, Lag= 0.0 min
Discarded = 0.00 cfs @ 11.23 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 95.69' @ 24.00 hrs Surf.Area= 754 sf Storage= 653 cf

Plug-Flow detention time= 343.9 min calculated for 0.002 af (10% of inflow)
Center-of-Mass det. time= 189.8 min (1,046.3 - 856.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.00'	469 cf	**12.17'W x 62.00'L x 2.79'H Field A** 2,106 cf Overall - 542 cf Embedded = 1,564 cf x 30.0% Voids
#2A	94.50'	542 cf	**CPP single-wall 18"** x 12 Inside #1 Inside= 18.0"W x 18.0"H => 2.26 sf x 20.00'L = 45.1 cf Outside= 21.5"W x 21.5"H => 2.26 sf x 20.00'L = 45.1 cf 12 Chambers in 4 Rows
		1,011 cf	Total Available Storage

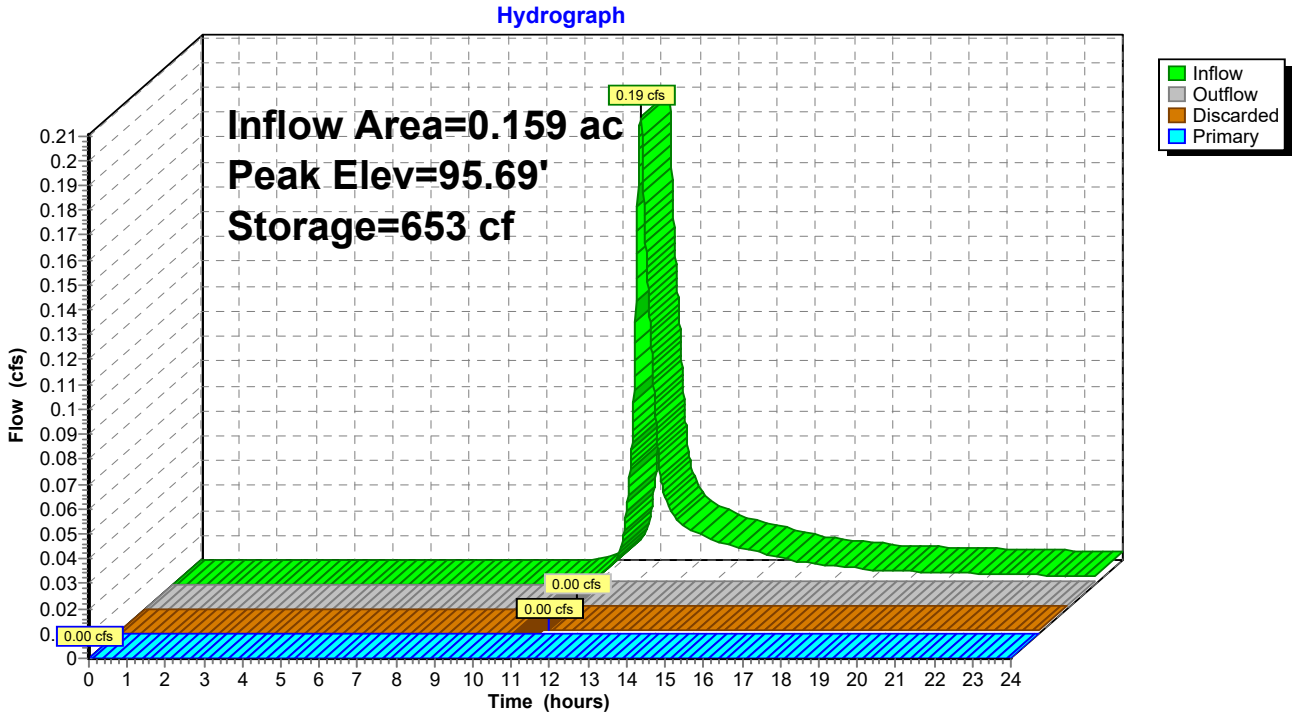
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.57'	**6.0" Round Culvert** L= 50.0' Ke= 0.900 Inlet / Outlet Invert= 95.57' / 95.00' S= 0.0114 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	94.00'	**0.090 in/hr Exfiltration over Surface area**
#3	Device 1	96.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 11.23 hrs HW=94.03' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond INF-1: Infiltration Sys #1 - Perf. Pipe



Summary for Pond INF-2: Infiltration Sys #2 - Retain-It

[42] Hint: Gap in defined storage above volume #1 at 97.67'

Inflow Area = 0.800 ac, 56.89% Impervious, Inflow Depth > 2.29" for 2-year event
Inflow = 1.98 cfs @ 12.09 hrs, Volume= 0.153 af
Outflow = 0.08 cfs @ 10.55 hrs, Volume= 0.106 af, Atten= 96%, Lag= 0.0 min
Discarded = 0.08 cfs @ 10.55 hrs, Volume= 0.106 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 95.65' @ 15.36 hrs Surf.Area= 3,204 sf Storage= 3,380 cf

Plug-Flow detention time= 264.9 min calculated for 0.106 af (69% of inflow)
Center-of-Mass det. time= 166.5 min (949.4 - 782.9)

Volume	Invert	Avail.Storage	Storage Description
#1B	94.00'	849 cf	**18.00'W x 178.00'L x 3.67'H Field B** 11,748 cf Overall - 8,917 cf Embedded = 2,831 cf x 30.0% Voids
#2B	94.50'	6,021 cf	**retain_it retain_it 2.5'** x 44 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 2 Rows adjusted for 158.4 cf perimeter wall
#3	97.67'	3 cf	**2.00'D x 0.83'H Vertical Cone/Cylinder** Impervious
		6,873 cf	Total Available Storage

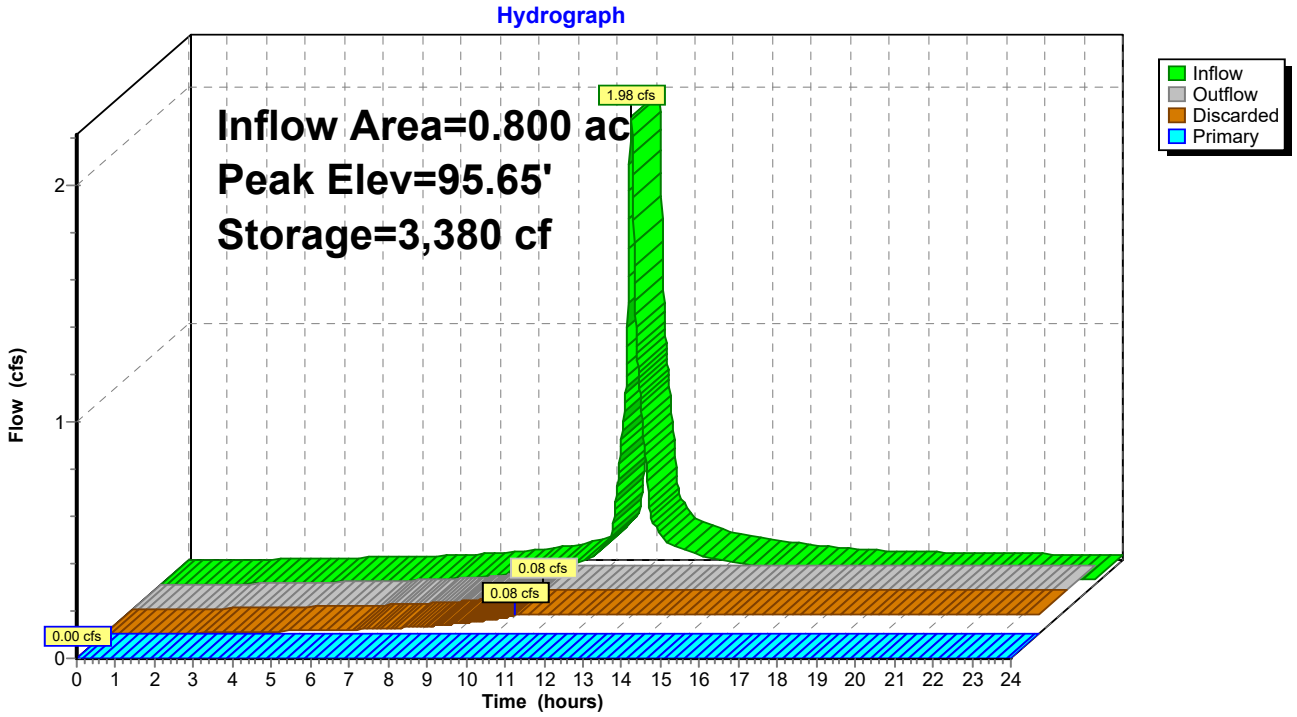
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	96.10'	**12.0" Round Culvert** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.10' / 95.95' S= 0.0214 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	94.00'	**1.080 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	97.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.08 cfs @ 10.55 hrs HW=94.05' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond INF-2: Infiltration Sys #2 - Retain-It



Summary for Pond INF-3: Infiltration Sys #3 - Retain-It

[79] Warning: Submerged Pond INF-2 Primary device # 1 INLET by 0.61'

Inflow Area = 2.099 ac, 72.64% Impervious, Inflow Depth > 1.68" for 2-year event
Inflow = 2.87 cfs @ 12.21 hrs, Volume= 0.294 af
Outflow = 0.70 cfs @ 12.72 hrs, Volume= 0.210 af, Atten= 76%, Lag= 30.6 min
Discarded = 0.08 cfs @ 8.76 hrs, Volume= 0.108 af
Primary = 0.62 cfs @ 12.72 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 96.71' @ 12.72 hrs Surf.Area= 3,060 sf Storage= 5,793 cf

Plug-Flow detention time= 176.6 min calculated for 0.210 af (71% of inflow)
Center-of-Mass det. time= 87.8 min (876.9 - 789.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.00'	812 cf	**18.00'W x 170.00'L x 3.67'H Field A** 11,220 cf Overall - 8,512 cf Embedded = 2,708 cf x 30.0% Voids
#2A	94.50'	5,747 cf	**retain_it retain_it 2.5'** x 42 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 2 Rows adjusted for 151.8 cf perimeter wall
		6,559 cf	Total Available Storage

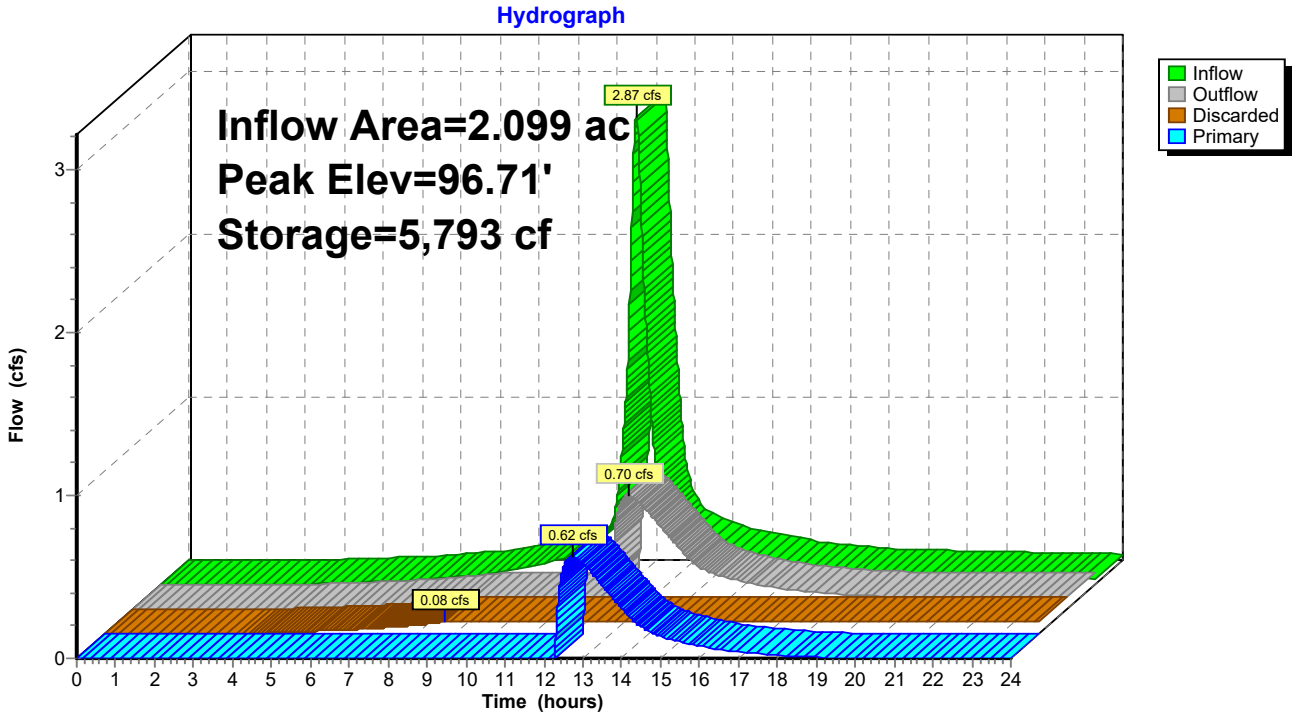
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	94.50'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.50' / 94.30' S= 0.0250 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	94.00'	**1.080 in/hr Exfiltration over Surface area**
#3	Device 1	96.80'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	96.00'	**4.0" Vert. Orifice/Grate X 2.00** C= 0.600

Discarded OutFlow Max=0.08 cfs @ 8.76 hrs HW=94.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.62 cfs @ 12.72 hrs HW=96.71' (Free Discharge)
└**1=Culvert** (Passes 0.62 cfs of 3.91 cfs potential flow)
  ├**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**4=Orifice/Grate** (Orifice Controls 0.62 cfs @ 3.56 fps)

Pond INF-3: Infiltration Sys #3 - Retain-It



Summary for Pond INF-4: Infiltration Sys #4 - Retain-It

Inflow Area = 1.972 ac, 63.61% Impervious, Inflow Depth > 0.76" for 2-year event
Inflow = 1.47 cfs @ 12.15 hrs, Volume= 0.124 af
Outflow = 0.06 cfs @ 10.83 hrs, Volume= 0.076 af, Atten= 96%, Lag= 0.0 min
Discarded = 0.06 cfs @ 10.83 hrs, Volume= 0.076 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 94.78' @ 15.78 hrs Surf.Area= 2,548 sf Storage= 3,038 cf

Plug-Flow detention time= 291.0 min calculated for 0.076 af (61% of inflow)
Center-of-Mass det. time= 187.9 min (1,004.4 - 816.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.00'	651 cf	**26.00'W x 98.00'L x 4.17'H Field A** 10,617 cf Overall - 8,448 cf Embedded = 2,169 cf x 30.0% Voids
#2A	93.50'	6,000 cf	**retain_it retain_it 3.0'** x 36 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 3 Rows adjusted for 141.6 cf perimeter wall
		6,651 cf	Total Available Storage

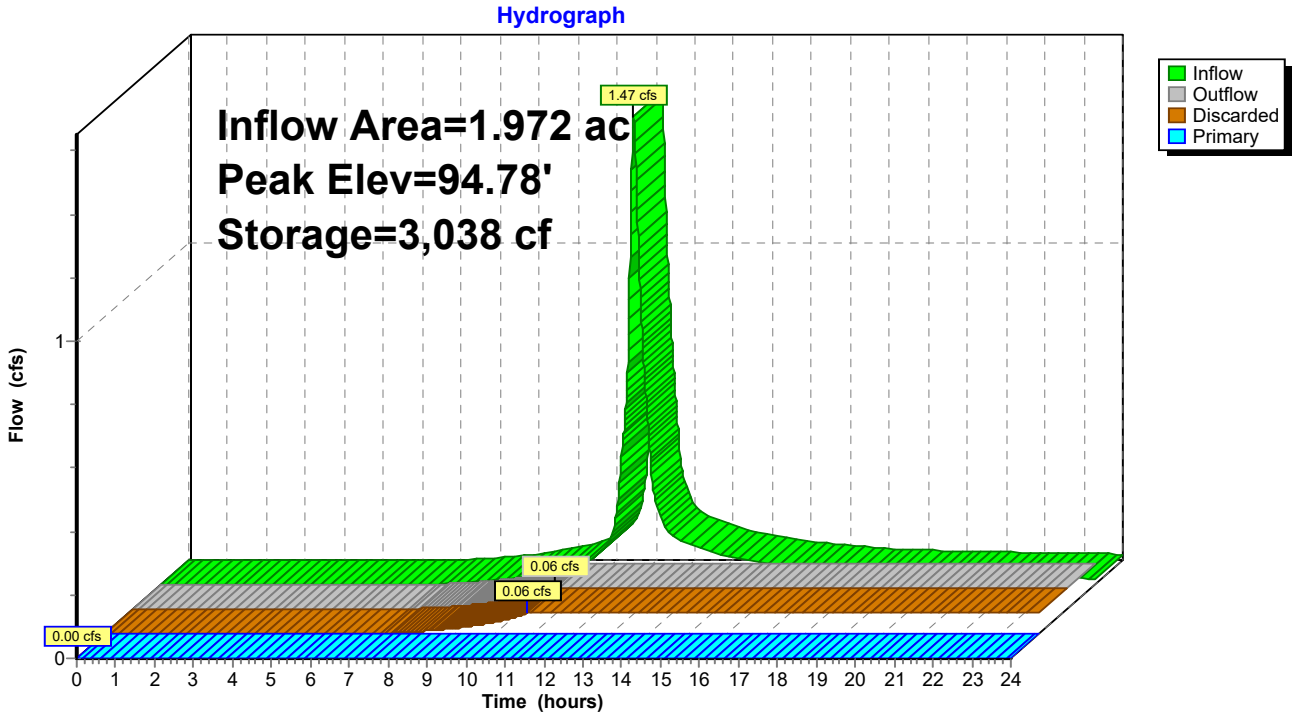
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**12.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.00' / 94.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	96.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Discarded	93.00'	**1.080 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 10.83 hrs HW=93.04' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=93.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond INF-4: Infiltration Sys #4 - Retain-It



Summary for Pond INF-5: Infiltration Sys #5 - Retain-It

Inflow Area = 1.275 ac, 74.14% Impervious, Inflow Depth > 2.70" for 2-year event
Inflow = 3.73 cfs @ 12.08 hrs, Volume= 0.287 af
Outflow = 0.12 cfs @ 9.63 hrs, Volume= 0.167 af, Atten= 97%, Lag= 0.0 min
Discarded = 0.12 cfs @ 9.63 hrs, Volume= 0.167 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 95.06' @ 15.81 hrs Surf.Area= 4,788 sf Storage= 6,990 cf

Plug-Flow detention time= 262.4 min calculated for 0.167 af (58% of inflow)
Center-of-Mass det. time= 152.3 min (925.5 - 773.2)

Volume	Invert	Avail.Storage	Storage Description
#1B	93.00'	1,057 cf	**42.00'W x 114.00'L x 4.17'H Field B** 19,950 cf Overall - 16,427 cf Embedded = 3,523 cf x 30.0% Voids
#2B	93.50'	11,763 cf	**retain_it retain_it 3.0'** x 70 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 5 Rows adjusted for 179.4 cf perimeter wall
		12,820 cf	Total Available Storage

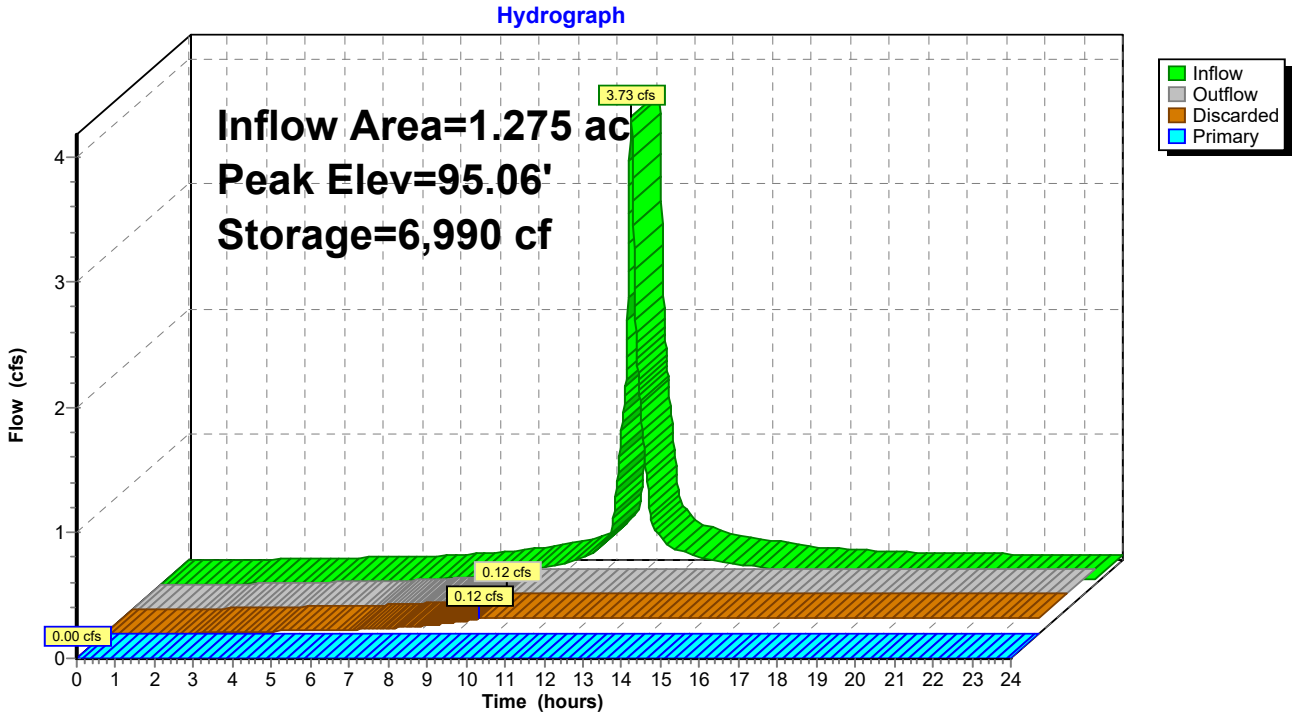
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.00' / 95.90' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	93.00'	**1.080 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	96.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.12 cfs @ 9.63 hrs HW=93.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=93.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond INF-5: Infiltration Sys #5 - Retain-It

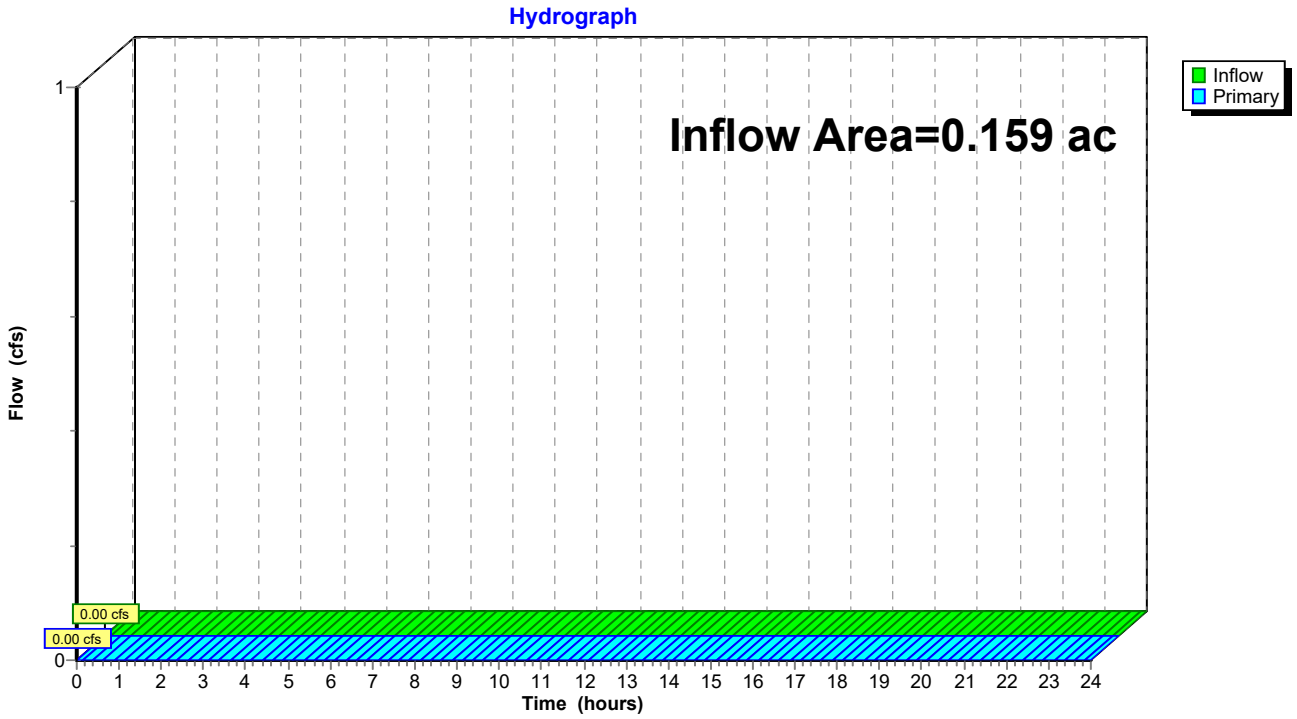


Summary for Link DP1: DEDHAM ST CB

Inflow Area = 0.159 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP1: DEDHAM ST CB

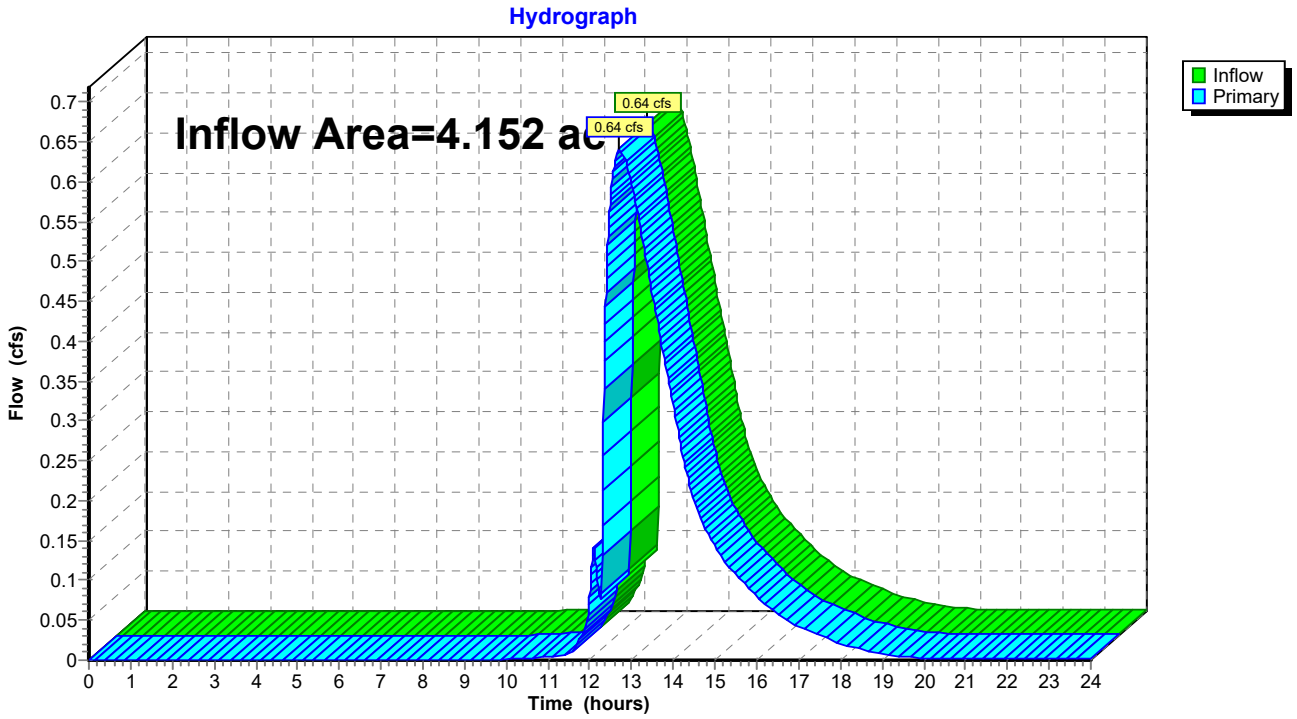


Summary for Link DP2: 2ND ST CB

Inflow Area = 4.152 ac, 66.94% Impervious, Inflow Depth > 0.32" for 2-year event
Inflow = 0.64 cfs @ 12.71 hrs, Volume= 0.112 af
Primary = 0.64 cfs @ 12.71 hrs, Volume= 0.112 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP2: 2ND ST CB

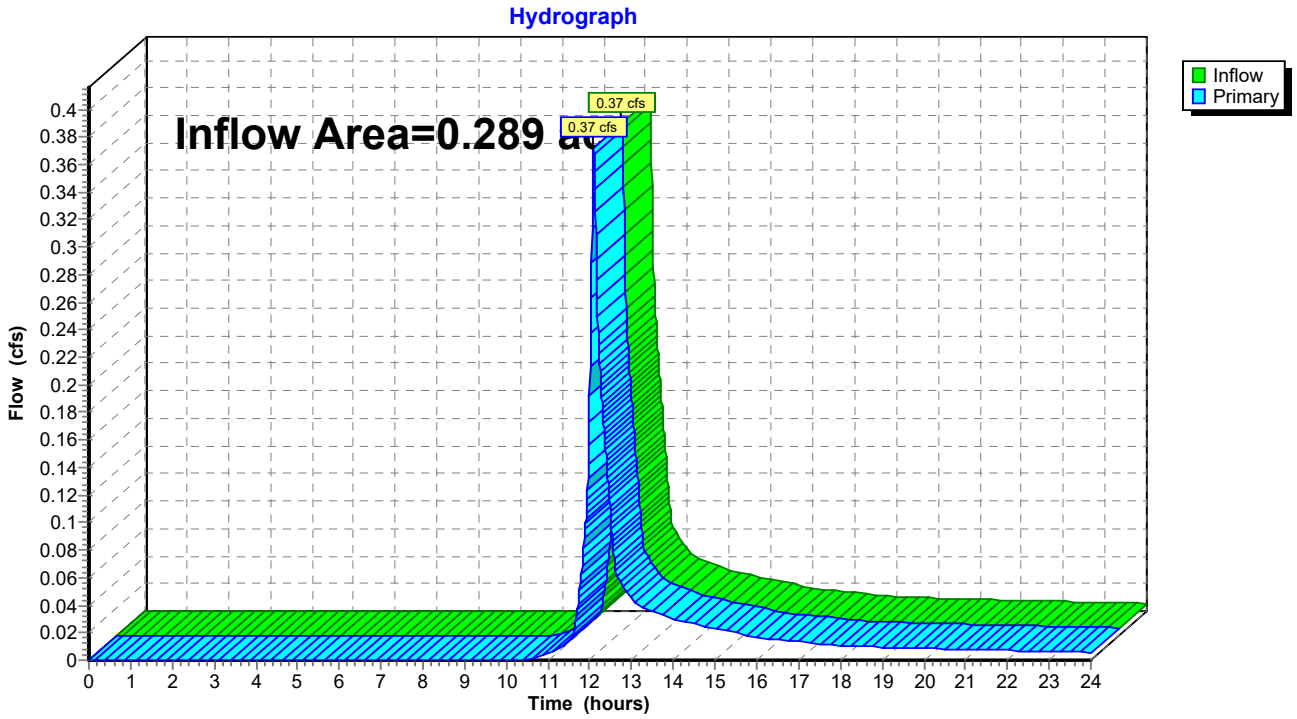


Summary for Link DP3: FLOODPLAIN OVERFLOW

Inflow Area = 0.289 ac, 0.00% Impervious, Inflow Depth > 1.14" for 2-year event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af
Primary = 0.37 cfs @ 12.09 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP3: FLOODPLAIN OVERFLOW



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP1: Runoff Area=6,924 sf 0.00% Impervious Runoff Depth>2.75"
Flow Length=200' Tc=11.9 min CN=76 Runoff=0.42 cfs 0.036 af

SubcatchmentP10: Runoff Area=21,889 sf 34.39% Impervious Runoff Depth>3.82"
Tc=6.0 min CN=87 Runoff=2.20 cfs 0.160 af

SubcatchmentP11: Runoff Area=12,600 sf 0.00% Impervious Runoff Depth>2.58"
Tc=6.0 min CN=74 Runoff=0.87 cfs 0.062 af

SubcatchmentP2: Runoff Area=17,496 sf 14.09% Impervious Runoff Depth>3.03"
Tc=6.0 min CN=79 Runoff=1.43 cfs 0.101 af

SubcatchmentP3: Runoff Area=3,391 sf 0.00% Impervious Runoff Depth>3.03"
Tc=6.0 min CN=79 Runoff=0.28 cfs 0.020 af

SubcatchmentP4: Runoff Area=17,366 sf 100.00% Impervious Runoff Depth>5.03"
Tc=6.0 min CN=98 Runoff=2.06 cfs 0.167 af

SubcatchmentP5: Runoff Area=30,376 sf 44.36% Impervious Runoff Depth>3.92"
Flow Length=380' Tc=11.1 min CN=88 Runoff=2.65 cfs 0.228 af

SubcatchmentP6: Runoff Area=53,169 sf 87.60% Impervious Runoff Depth>4.68"
Flow Length=564' Tc=16.3 min CN=95 Runoff=4.54 cfs 0.476 af

SubcatchmentP7: Runoff Area=2,338 sf 0.00% Impervious Runoff Depth>3.13"
Tc=6.0 min CN=80 Runoff=0.20 cfs 0.014 af

SubcatchmentP8: Runoff Area=1,182 sf 0.00% Impervious Runoff Depth>3.13"
Tc=6.0 min CN=80 Runoff=0.10 cfs 0.007 af

SubcatchmentP9: Runoff Area=33,650 sf 100.00% Impervious Runoff Depth>5.03"
Tc=6.0 min CN=98 Runoff=3.98 cfs 0.324 af

Pond 3: DMH-3 Peak Elev=96.95' Inflow=4.62 cfs 0.320 af
12.0" Round Culvert n=0.010 L=12.0' S=0.0050 '/' Outflow=4.62 cfs 0.320 af

Pond INF-1: Infiltration Sys #1 - Perf. Pipe Peak Elev=96.77' Storage=1,006 cf Inflow=0.42 cfs 0.036 af
Discarded=0.00 cfs 0.002 af Primary=0.04 cfs 0.012 af Outflow=0.04 cfs 0.013 af

Pond INF-2: Infiltration Sys #2 - Retain-It Peak Elev=97.04' Storage=6,797 cf Inflow=3.48 cfs 0.269 af
Discarded=0.08 cfs 0.117 af Primary=0.11 cfs 0.012 af Outflow=0.19 cfs 0.129 af

Pond INF-3: Infiltration Sys #3 - Retain-It Peak Elev=97.39' Storage=6,528 cf Inflow=4.69 cfs 0.507 af
Discarded=0.08 cfs 0.121 af Primary=4.62 cfs 0.293 af Outflow=4.69 cfs 0.414 af

Pond INF-4: Infiltration Sys #4 - Retain-It Peak Elev=96.58' Storage=6,608 cf Inflow=2.65 cfs 0.254 af
Discarded=0.06 cfs 0.085 af Primary=0.26 cfs 0.027 af Outflow=0.32 cfs 0.112 af

Pond INF-5: Infiltration Sys #5 - Retain-It Peak Elev=96.57' Storage=12,765 cf Inflow=6.19 cfs 0.484 af
Discarded=0.12 cfs 0.185 af Primary=0.21 cfs 0.026 af Outflow=0.33 cfs 0.210 af

Link DP1: DEDHAM ST CB Inflow=0.04 cfs 0.012 af
Primary=0.04 cfs 0.012 af

Link DP2: 2ND ST CB Inflow=4.78 cfs 0.341 af
Primary=4.78 cfs 0.341 af

Link DP3: FLOODPLAIN OVERFLOW Inflow=0.87 cfs 0.062 af
Primary=0.87 cfs 0.062 af

Total Runoff Area = 4.600 ac Runoff Volume = 1.595 af Average Runoff Depth = 4.16"
39.58% Pervious = 1.821 ac 60.42% Impervious = 2.779 ac

Summary for Subcatchment P1:

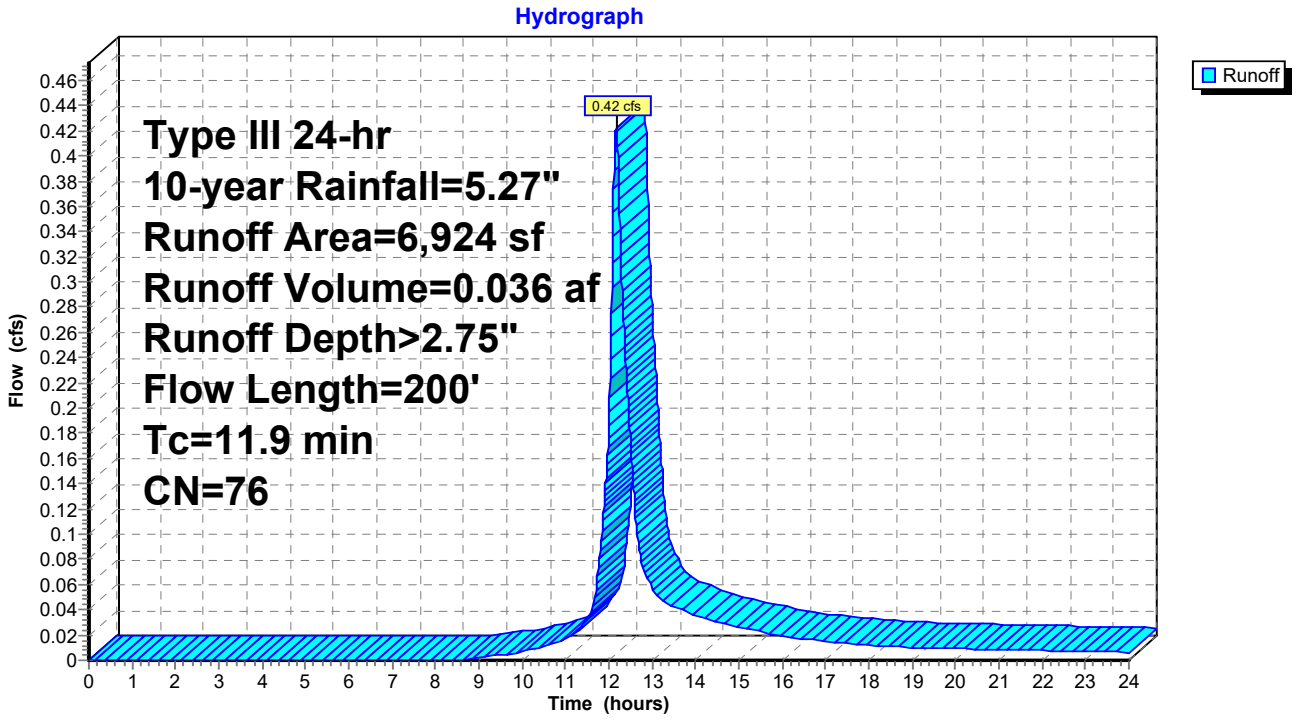
Runoff = 0.42 cfs @ 12.17 hrs, Volume= 0.036 af, Depth> 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
6,400	74	>75% Grass cover, Good, HSG C
524	96	Gravel surface, HSG C
6,924	76	Weighted Average
6,924		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0130	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
0.4	44	0.0130	1.71		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
0.1	56	0.3330	8.66		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
11.9	200	Total			

Subcatchment P1:



Summary for Subcatchment P10:

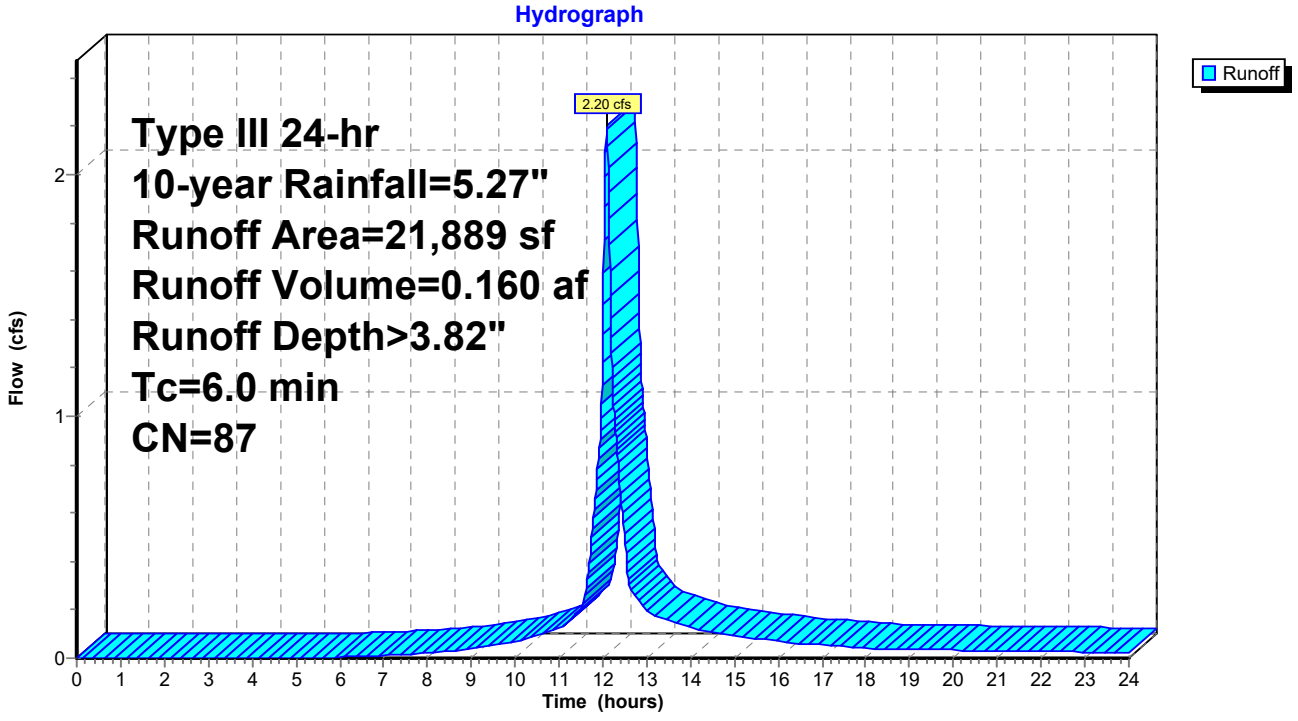
Runoff = 2.20 cfs @ 12.09 hrs, Volume= 0.160 af, Depth> 3.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

	Area (sf)	CN	Description
*	7,528	98	Patio Area
	13,700	80	>75% Grass cover, Good, HSG D
	661	96	Gravel surface, HSG C
	21,889	87	Weighted Average
	14,361		65.61% Pervious Area
	7,528		34.39% Impervious Area

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

Subcatchment P10:



Summary for Subcatchment P11:

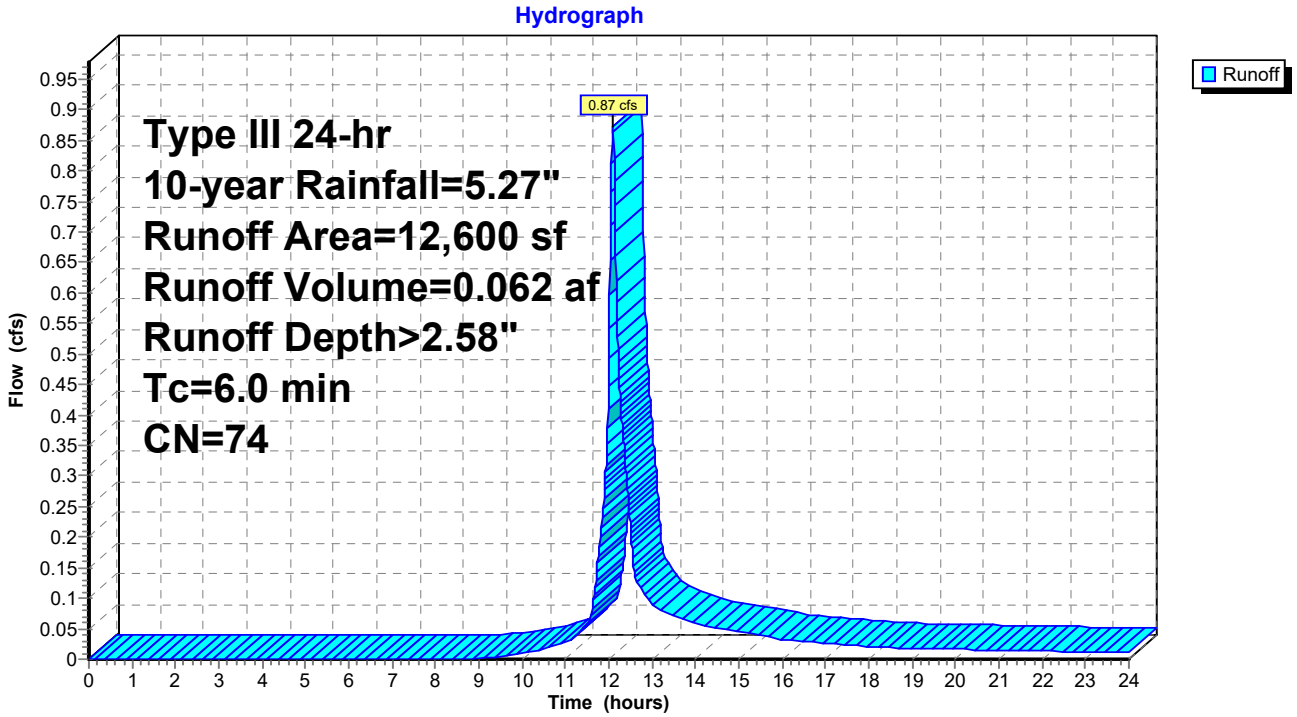
Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.062 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
12,600	74	>75% Grass cover, Good, HSG C
12,600		100.00% Pervious Area

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

Subcatchment P11:



Summary for Subcatchment P2:

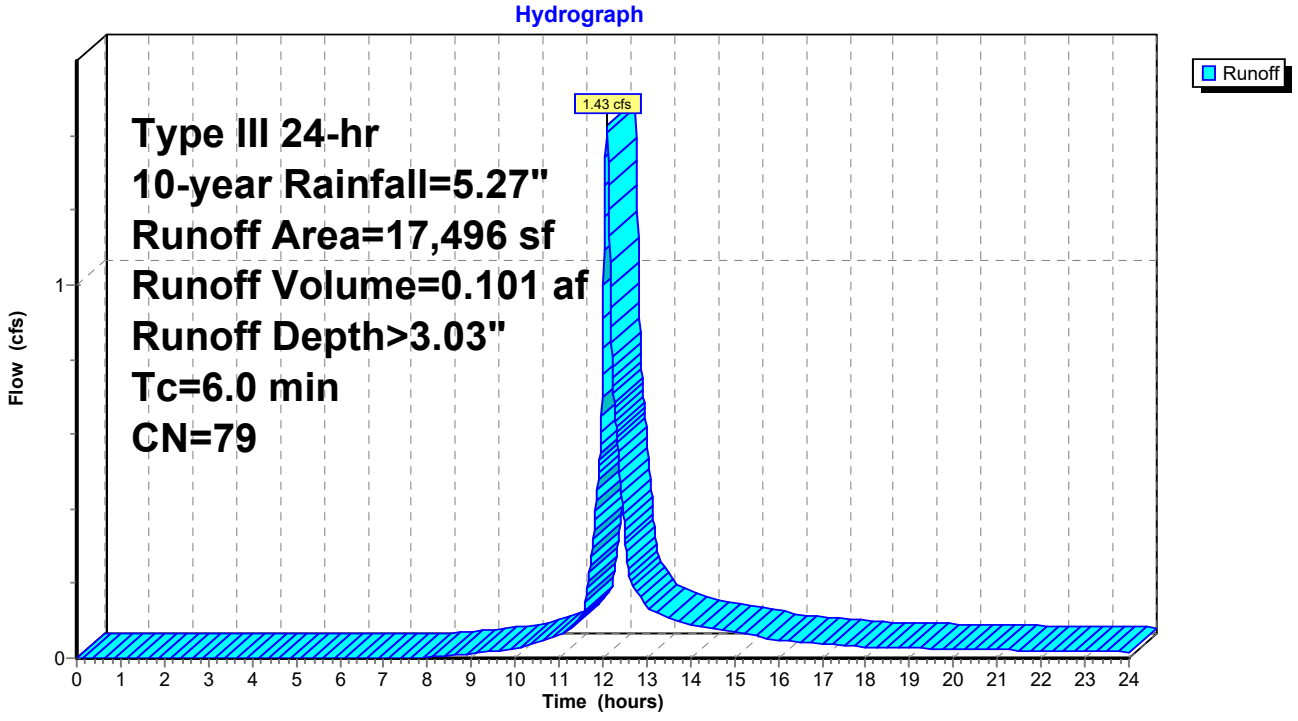
Runoff = 1.43 cfs @ 12.09 hrs, Volume= 0.101 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

	Area (sf)	CN	Description
*	2,466	98	Patio Area
	13,800	74	>75% Grass cover, Good, HSG C
*	1,230	96	Gravel Path Area
	17,496	79	Weighted Average
	15,030		85.91% Pervious Area
	2,466		14.09% Impervious Area

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

Subcatchment P2:



Summary for Subcatchment P3:

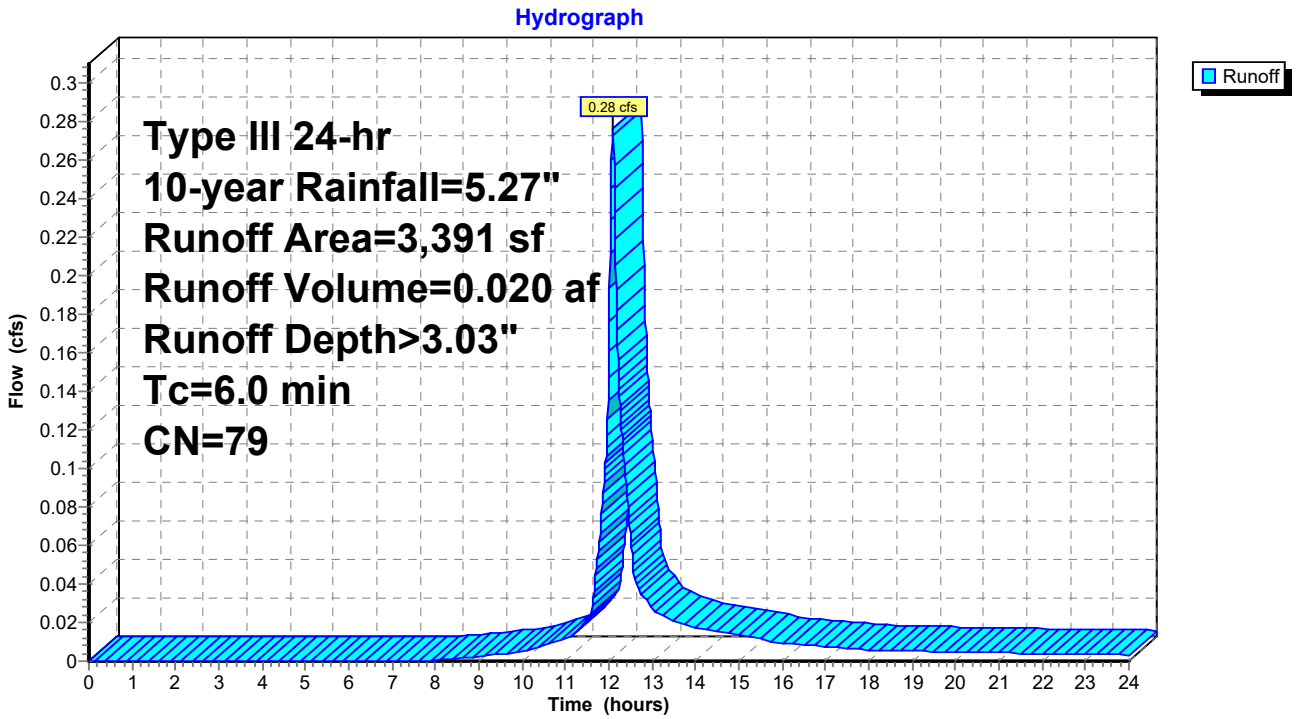
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.020 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

	Area (sf)	CN	Description
*	726	96	Gravel Path Area
	2,665	74	>75% Grass cover, Good, HSG C
	3,391	79	Weighted Average
	3,391		100.00% Pervious Area

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

Subcatchment P3:



Summary for Subcatchment P4:

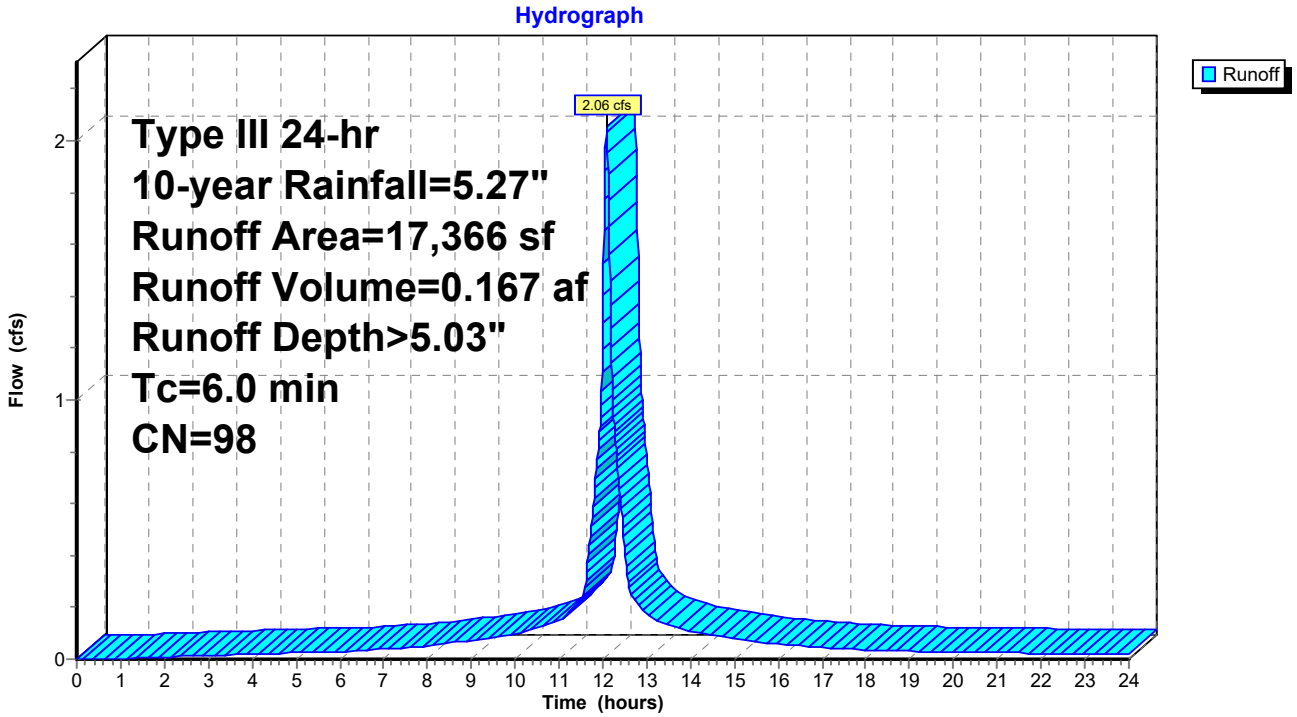
Runoff = 2.06 cfs @ 12.08 hrs, Volume= 0.167 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
17,366	98	Roofs, HSG C
17,366		100.00% Impervious Area

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

Subcatchment P4:



Summary for Subcatchment P5:

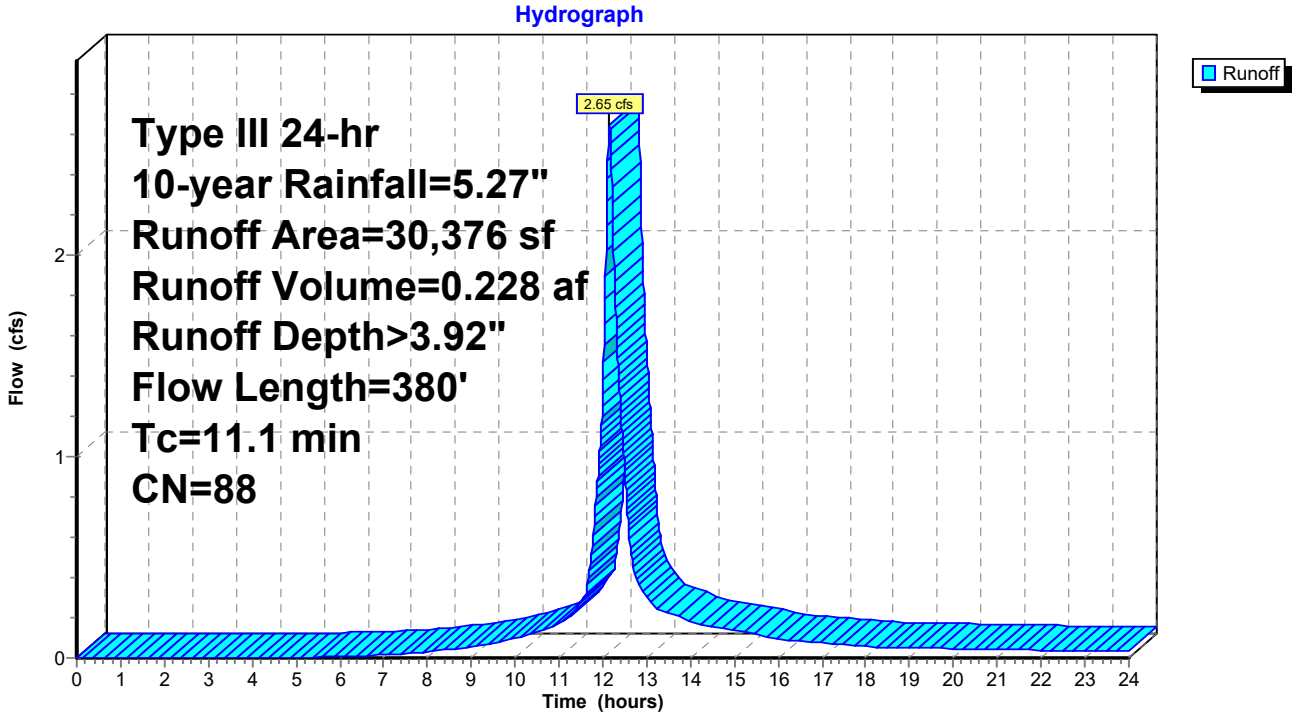
Runoff = 2.65 cfs @ 12.15 hrs, Volume= 0.228 af, Depth> 3.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
13,476	98	Paved roads w/curbs & sewers, HSG D
16,900	80	>75% Grass cover, Good, HSG D
30,376	88	Weighted Average
16,900		55.64% Pervious Area
13,476		44.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	25	0.3300	0.41		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
8.9	65	0.0100	0.12		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
1.2	290	0.0050	4.17	3.28	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
11.1	380	Total			

Subcatchment P5:



Summary for Subcatchment P6:

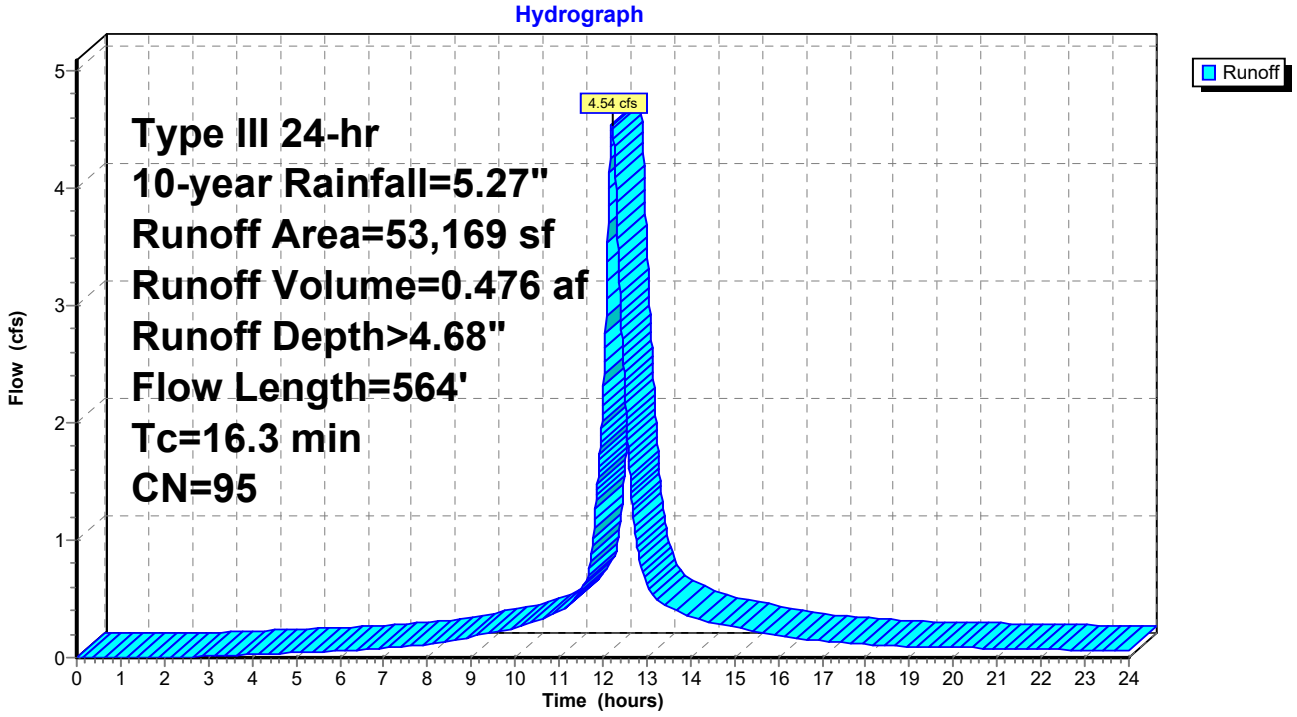
Runoff = 4.54 cfs @ 12.22 hrs, Volume= 0.476 af, Depth> 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

	Area (sf)	CN	Description
	45,865	98	Roofs, HSG C
*	711	98	Conc Path
	6,593	74	>75% Grass cover, Good, HSG C
	53,169	95	Weighted Average
	6,593		12.40% Pervious Area
	46,576		87.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0090	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
0.4	34	0.0090	1.42		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
2.7	430	0.0050	2.63	0.52	**Pipe Channel, Pipe Channel Flow** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
16.3	564	Total			

Subcatchment P6:



Summary for Subcatchment P7:

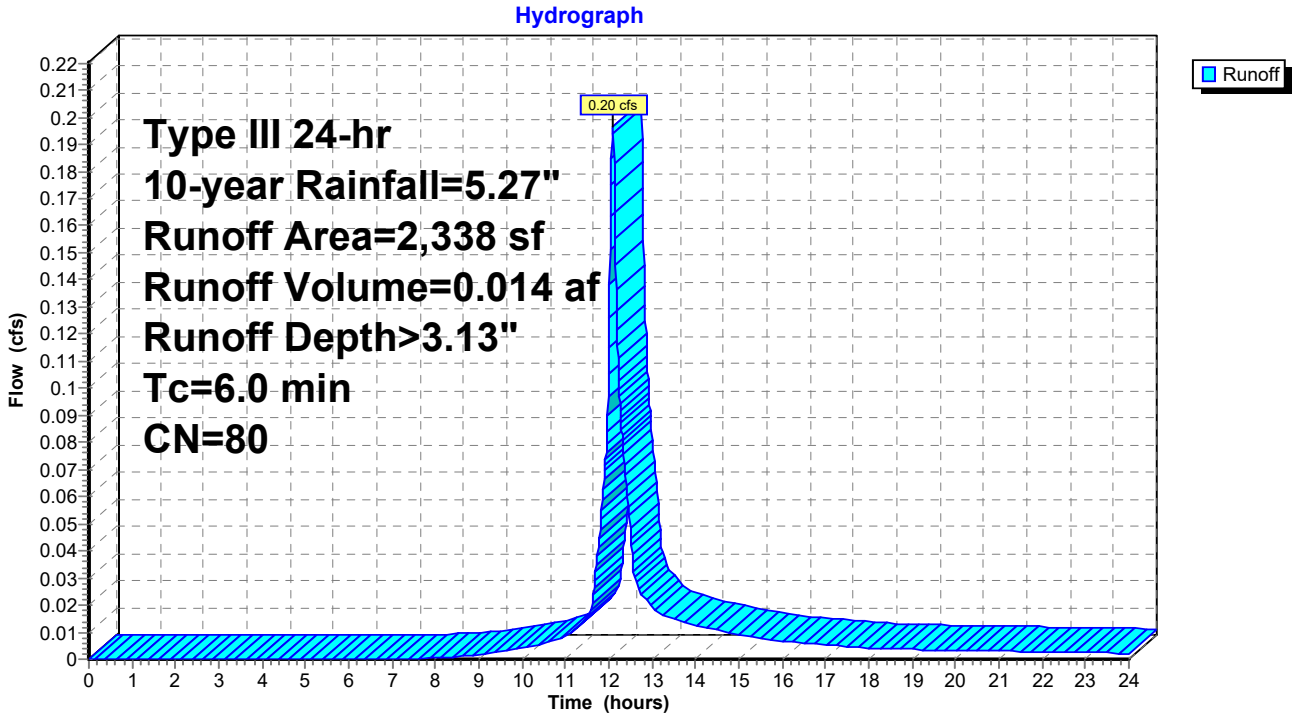
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.014 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
2,338	80	>75% Grass cover, Good, HSG D
2,338		100.00% Pervious Area

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

Subcatchment P7:



Summary for Subcatchment P8:

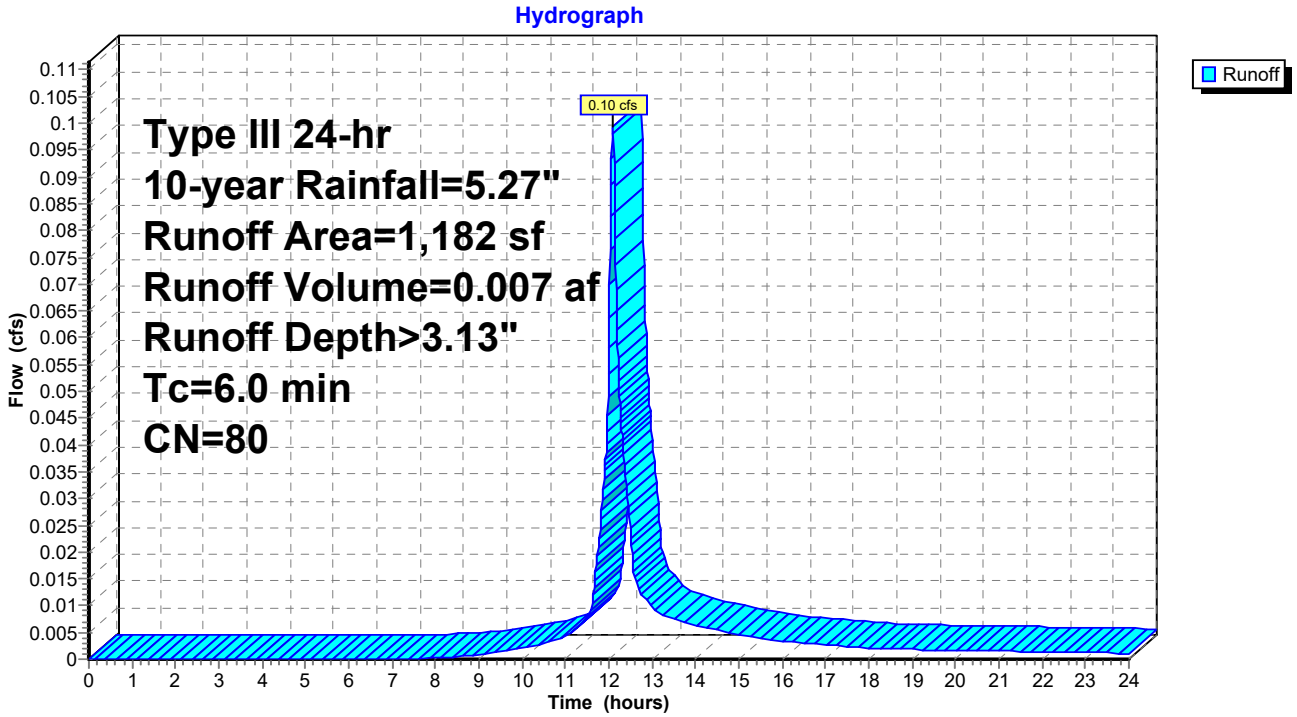
Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
1,182	80	>75% Grass cover, Good, HSG D
1,182		100.00% Pervious Area

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

Subcatchment P8:



Summary for Subcatchment P9:

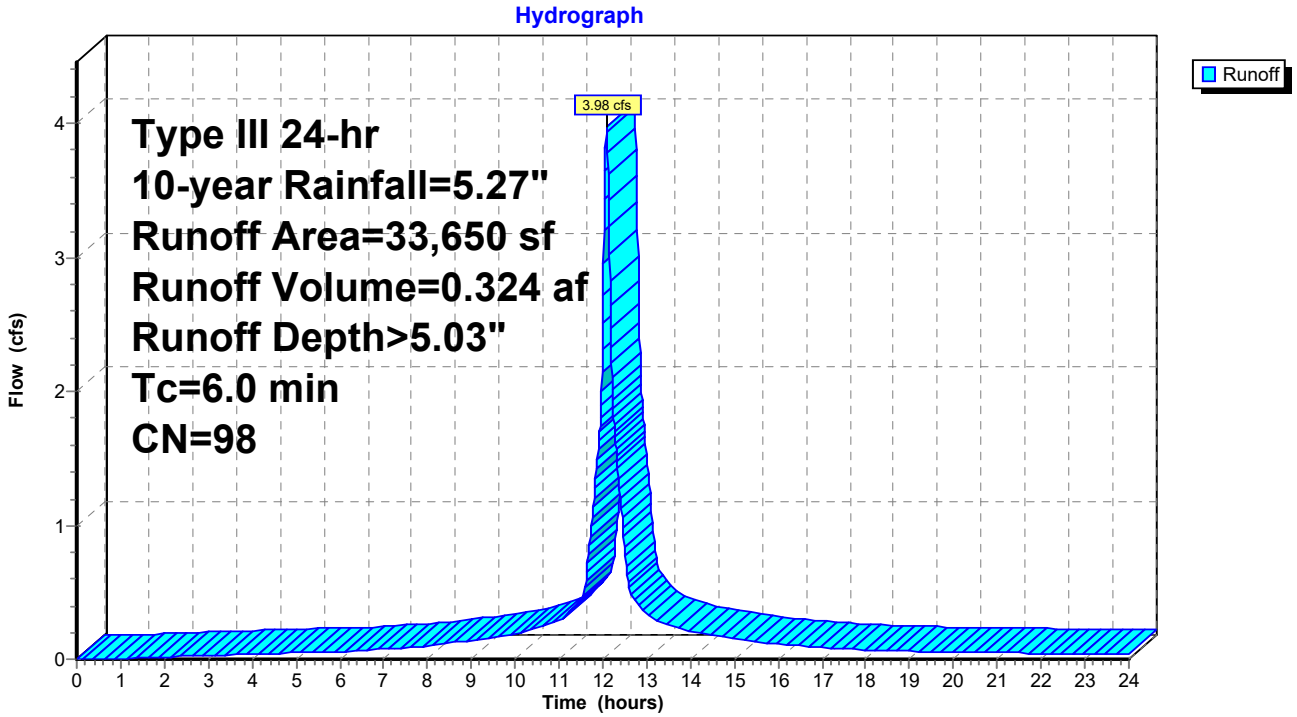
Runoff = 3.98 cfs @ 12.08 hrs, Volume= 0.324 af, Depth> 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.27"

Area (sf)	CN	Description
33,650	98	Roofs, HSG A
33,650		100.00% Impervious Area

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

Subcatchment P9:



Summary for Pond 3: DMH-3

[57] Hint: Peaked at 96.95' (Flood elevation advised)
[79] Warning: Submerged Pond INF-3 Primary device # 1 INLET by 2.45'
[81] Warning: Exceeded Pond INF-4 by 2.09' @ 12.21 hrs

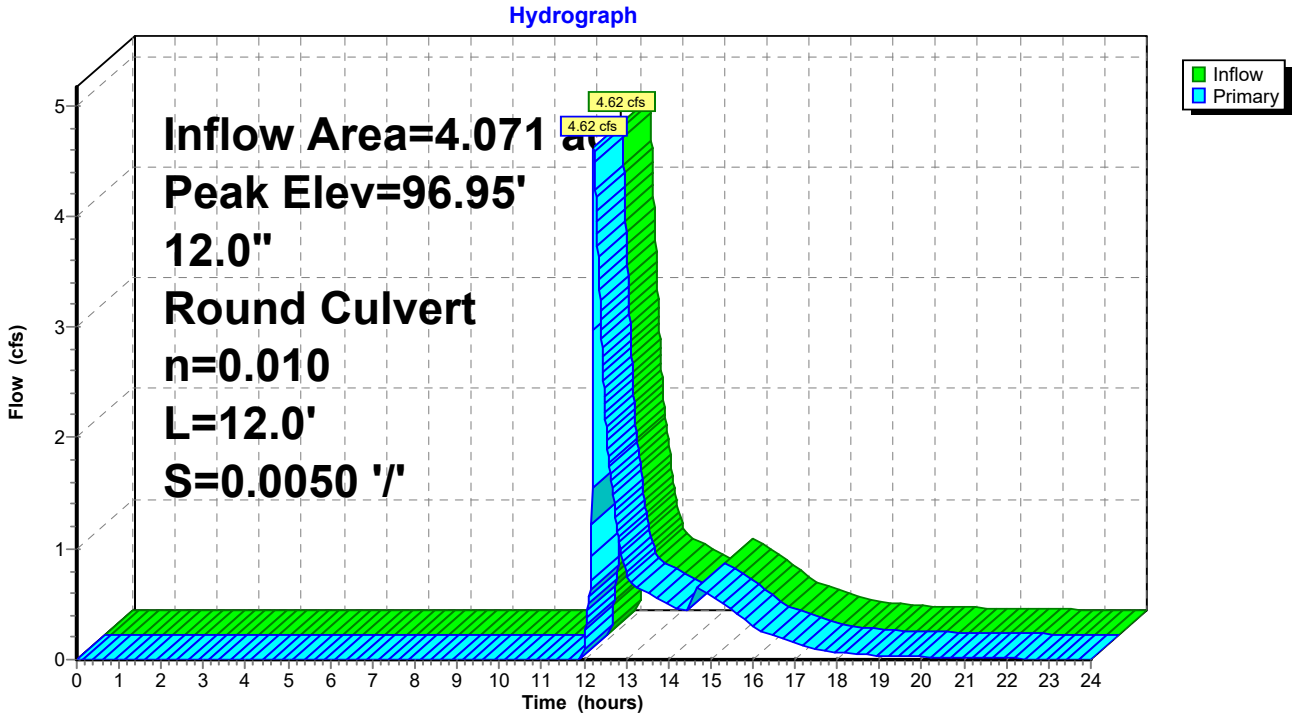
Inflow Area = 4.071 ac, 68.27% Impervious, Inflow Depth = 0.94" for 10-year event
Inflow = 4.62 cfs @ 12.21 hrs, Volume= 0.320 af
Outflow = 4.62 cfs @ 12.21 hrs, Volume= 0.320 af, Atten= 0%, Lag= 0.0 min
Primary = 4.62 cfs @ 12.21 hrs, Volume= 0.320 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 96.95' @ 12.21 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.06' / 94.00' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.62 cfs @ 12.21 hrs HW=96.95' (Free Discharge)
1=Culvert (Inlet Controls 4.62 cfs @ 5.88 fps)

Pond 3: DMH-3



Summary for Pond INF-1: Infiltration Sys #1 - Perf. Pipe

Inflow Area = 0.159 ac, 0.00% Impervious, Inflow Depth > 2.75" for 10-year event
Inflow = 0.42 cfs @ 12.17 hrs, Volume= 0.036 af
Outflow = 0.04 cfs @ 13.58 hrs, Volume= 0.013 af, Atten= 90%, Lag= 84.7 min
Discarded = 0.00 cfs @ 9.60 hrs, Volume= 0.002 af
Primary = 0.04 cfs @ 13.58 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 96.77' @ 13.58 hrs Surf.Area= 754 sf Storage= 1,006 cf

Plug-Flow detention time= 300.7 min calculated for 0.013 af (37% of inflow)
Center-of-Mass det. time= 176.0 min (1,009.8 - 833.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.00'	469 cf	**12.17'W x 62.00'L x 2.79'H Field A** 2,106 cf Overall - 542 cf Embedded = 1,564 cf x 30.0% Voids
#2A	94.50'	542 cf	**CPP single-wall 18"** x 12 Inside #1 Inside= 18.0"W x 18.0"H => 2.26 sf x 20.00'L = 45.1 cf Outside= 21.5"W x 21.5"H => 2.26 sf x 20.00'L = 45.1 cf 12 Chambers in 4 Rows
		1,011 cf	Total Available Storage

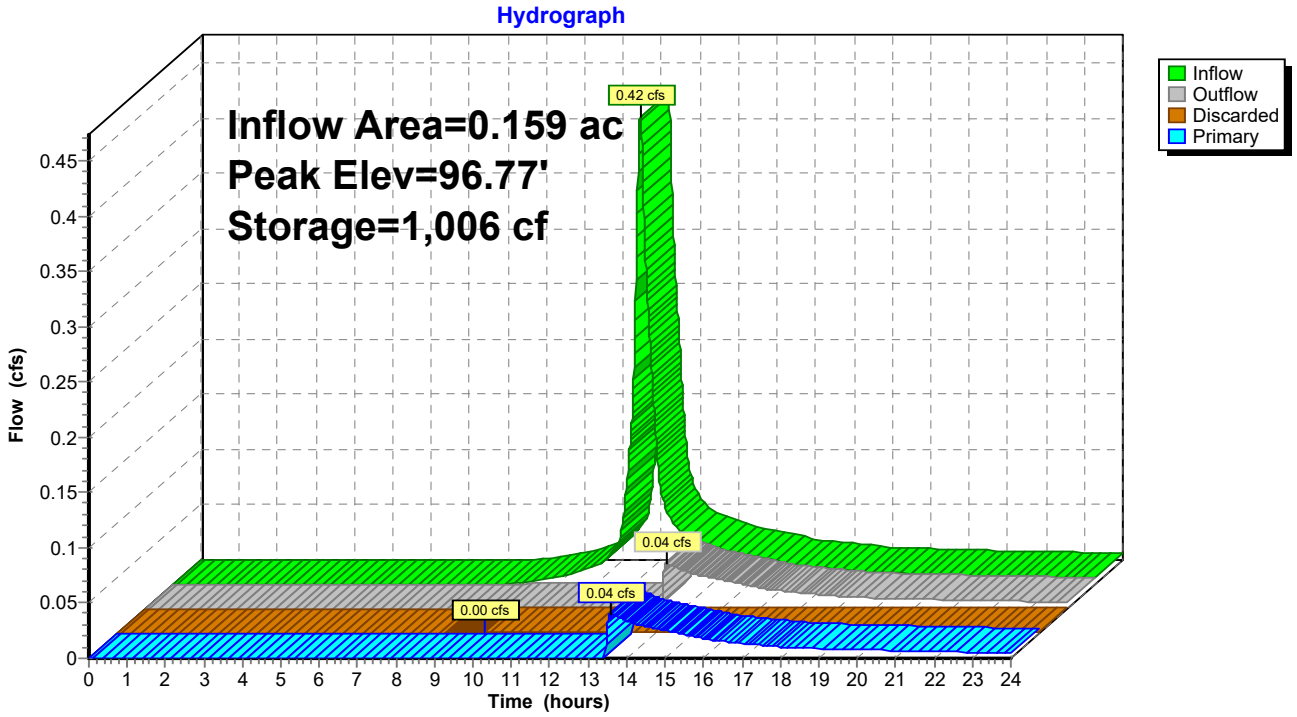
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.57'	**6.0" Round Culvert** L= 50.0' Ke= 0.900 Inlet / Outlet Invert= 95.57' / 95.00' S= 0.0114 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	94.00'	**0.090 in/hr Exfiltration over Surface area**
#3	Device 1	96.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 9.60 hrs HW=94.03' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.04 cfs @ 13.58 hrs HW=96.77' (Free Discharge)
└**1=Culvert** (Passes 0.04 cfs of 0.73 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.41 fps)

Pond INF-1: Infiltration Sys #1 - Perf. Pipe



Summary for Pond INF-2: Infiltration Sys #2 - Retain-It

[42] Hint: Gap in defined storage above volume #1 at 97.67'

Inflow Area = 0.800 ac, 56.89% Impervious, Inflow Depth > 4.03" for 10-year event
Inflow = 3.48 cfs @ 12.09 hrs, Volume= 0.269 af
Outflow = 0.19 cfs @ 14.16 hrs, Volume= 0.129 af, Atten= 95%, Lag= 124.7 min
Discarded = 0.08 cfs @ 9.03 hrs, Volume= 0.117 af
Primary = 0.11 cfs @ 14.16 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.04' @ 14.16 hrs Surf.Area= 3,204 sf Storage= 6,797 cf

Plug-Flow detention time= 251.3 min calculated for 0.129 af (48% of inflow)
Center-of-Mass det. time= 123.9 min (898.8 - 774.9)

Volume	Invert	Avail.Storage	Storage Description
#1B	94.00'	849 cf	**18.00'W x 178.00'L x 3.67'H Field B** 11,748 cf Overall - 8,917 cf Embedded = 2,831 cf x 30.0% Voids
#2B	94.50'	6,021 cf	**retain_it retain_it 2.5'** x 44 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 2 Rows adjusted for 158.4 cf perimeter wall
#3	97.67'	3 cf	**2.00'D x 0.83'H Vertical Cone/Cylinder** Impervious
		6,873 cf	Total Available Storage

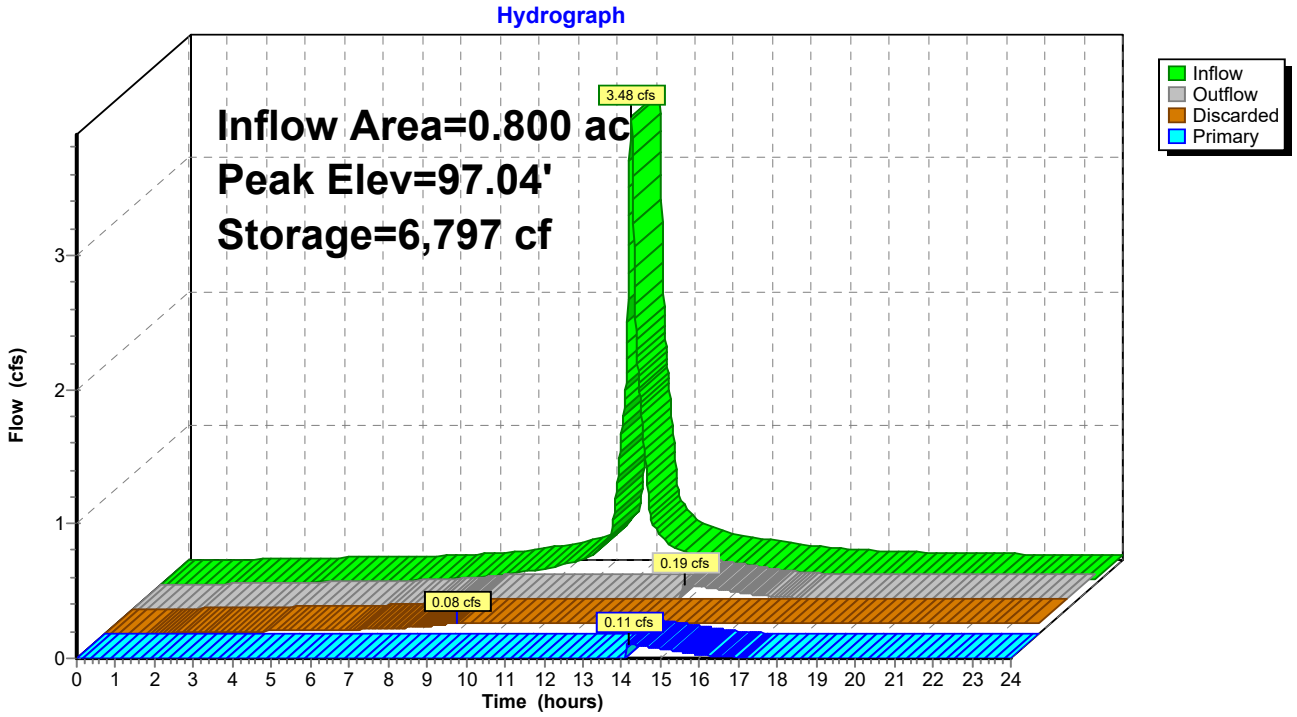
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	96.10'	**12.0" Round Culvert** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.10' / 95.95' S= 0.0214 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	94.00'	**1.080 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	97.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.08 cfs @ 9.03 hrs HW=94.05' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.10 cfs @ 14.16 hrs HW=97.04' (Free Discharge)
└**1=Culvert** (Passes 0.10 cfs of 2.00 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.57 fps)

Pond INF-2: Infiltration Sys #2 - Retain-It



Summary for Pond INF-3: Infiltration Sys #3 - Retain-It

[81] Warning: Exceeded Pond INF-2 by 1.38' @ 12.21 hrs

Inflow Area = 2.099 ac, 72.64% Impervious, Inflow Depth > 2.90" for 10-year event
Inflow = 4.69 cfs @ 12.21 hrs, Volume= 0.507 af
Outflow = 4.69 cfs @ 12.21 hrs, Volume= 0.414 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.08 cfs @ 6.97 hrs, Volume= 0.121 af
Primary = 4.62 cfs @ 12.21 hrs, Volume= 0.293 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 97.39' @ 12.21 hrs Surf.Area= 3,060 sf Storage= 6,528 cf

Plug-Flow detention time= 123.2 min calculated for 0.413 af (82% of inflow)
Center-of-Mass det. time= 53.1 min (832.7 - 779.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.00'	812 cf	**18.00'W x 170.00'L x 3.67'H Field A** 11,220 cf Overall - 8,512 cf Embedded = 2,708 cf x 30.0% Voids
#2A	94.50'	5,747 cf	**retain_it retain_it 2.5'** x 42 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 2 Rows adjusted for 151.8 cf perimeter wall
		6,559 cf	Total Available Storage

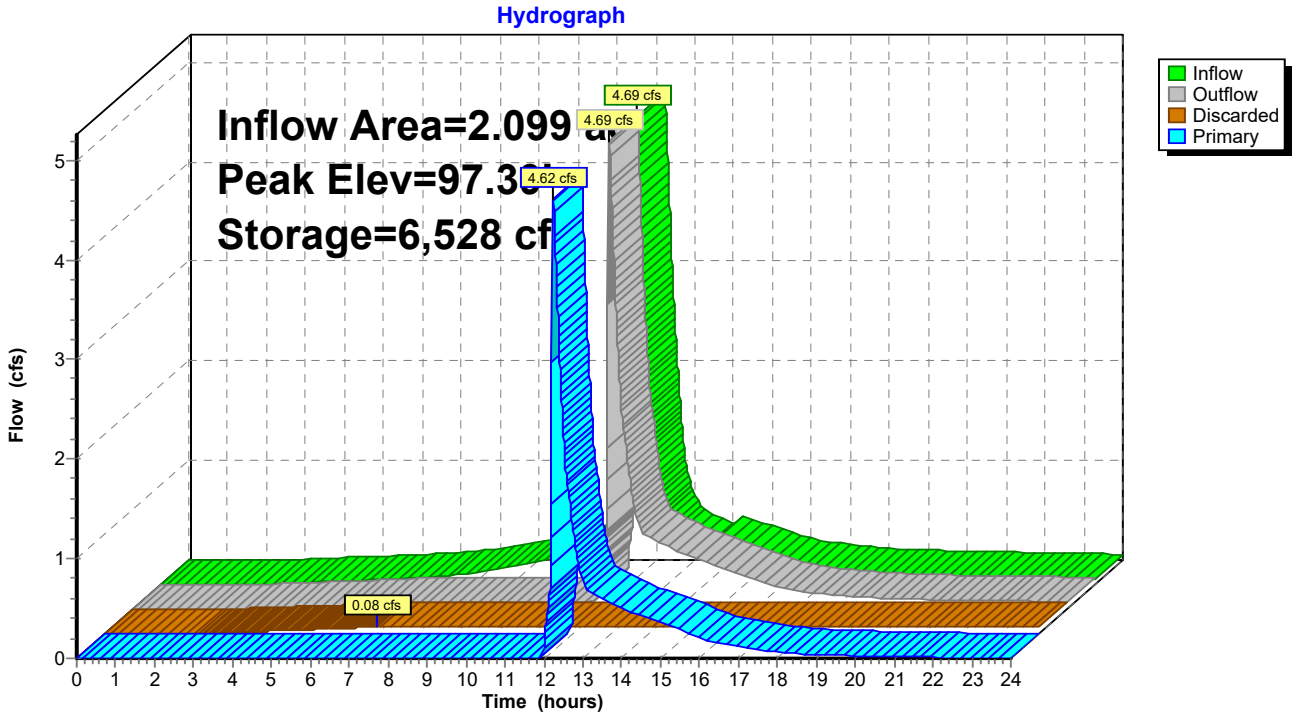
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	94.50'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.50' / 94.30' S= 0.0250 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	94.00'	**1.080 in/hr Exfiltration over Surface area**
#3	Device 1	96.80'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	96.00'	**4.0" Vert. Orifice/Grate X 2.00** C= 0.600

Discarded OutFlow Max=0.08 cfs @ 6.97 hrs HW=94.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=4.62 cfs @ 12.21 hrs HW=97.39' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.62 cfs @ 5.88 fps)
├**3=Broad-Crested Rectangular Weir** (Passes < 5.58 cfs potential flow)
└**4=Orifice/Grate** (Passes < 0.93 cfs potential flow)

Pond INF-3: Infiltration Sys #3 - Retain-It



Summary for Pond INF-4: Infiltration Sys #4 - Retain-It

[81] Warning: Exceeded Pond INF-5 by 0.02' @ 14.59 hrs

Inflow Area = 1.972 ac, 63.61% Impervious, Inflow Depth > 1.54" for 10-year event
Inflow = 2.65 cfs @ 12.15 hrs, Volume= 0.254 af
Outflow = 0.32 cfs @ 14.58 hrs, Volume= 0.112 af, Atten= 88%, Lag= 145.8 min
Discarded = 0.06 cfs @ 9.30 hrs, Volume= 0.085 af
Primary = 0.26 cfs @ 14.58 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 96.58' @ 14.58 hrs Surf.Area= 2,548 sf Storage= 6,608 cf

Plug-Flow detention time= 260.1 min calculated for 0.112 af (44% of inflow)
Center-of-Mass det. time= 136.9 min (947.2 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.00'	651 cf	**26.00'W x 98.00'L x 4.17'H Field A** 10,617 cf Overall - 8,448 cf Embedded = 2,169 cf x 30.0% Voids
#2A	93.50'	6,000 cf	**retain_it retain_it 3.0'** x 36 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 3 Rows adjusted for 141.6 cf perimeter wall
		6,651 cf	Total Available Storage

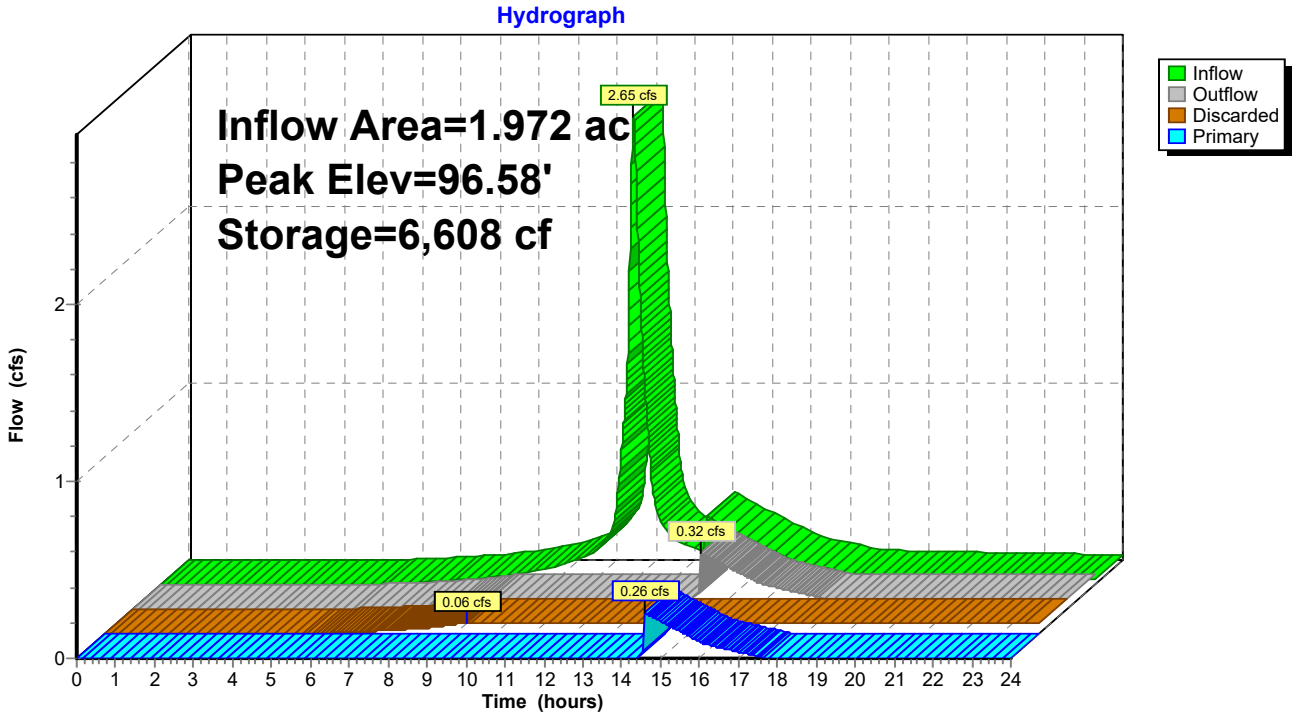
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**12.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.00' / 94.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	96.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Discarded	93.00'	**1.080 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 9.30 hrs HW=93.04' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.25 cfs @ 14.58 hrs HW=96.58' (Free Discharge)
└**1=Culvert** (Passes 0.25 cfs of 3.10 cfs potential flow)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.79 fps)

Pond INF-4: Infiltration Sys #4 - Retain-It



Summary for Pond INF-5: Infiltration Sys #5 - Retain-It

Inflow Area = 1.275 ac, 74.14% Impervious, Inflow Depth > 4.55" for 10-year event
Inflow = 6.19 cfs @ 12.08 hrs, Volume= 0.484 af
Outflow = 0.33 cfs @ 14.04 hrs, Volume= 0.210 af, Atten= 95%, Lag= 117.3 min
Discarded = 0.12 cfs @ 8.19 hrs, Volume= 0.185 af
Primary = 0.21 cfs @ 14.04 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 96.57' @ 14.04 hrs Surf.Area= 4,788 sf Storage= 12,765 cf

Plug-Flow detention time= 249.3 min calculated for 0.210 af (44% of inflow)
Center-of-Mass det. time= 112.5 min (876.3 - 763.8)

Volume	Invert	Avail.Storage	Storage Description
#1B	93.00'	1,057 cf	**42.00'W x 114.00'L x 4.17'H Field B** 19,950 cf Overall - 16,427 cf Embedded = 3,523 cf x 30.0% Voids
#2B	93.50'	11,763 cf	**retain_it retain_it 3.0'** x 70 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 5 Rows adjusted for 179.4 cf perimeter wall
		12,820 cf	Total Available Storage

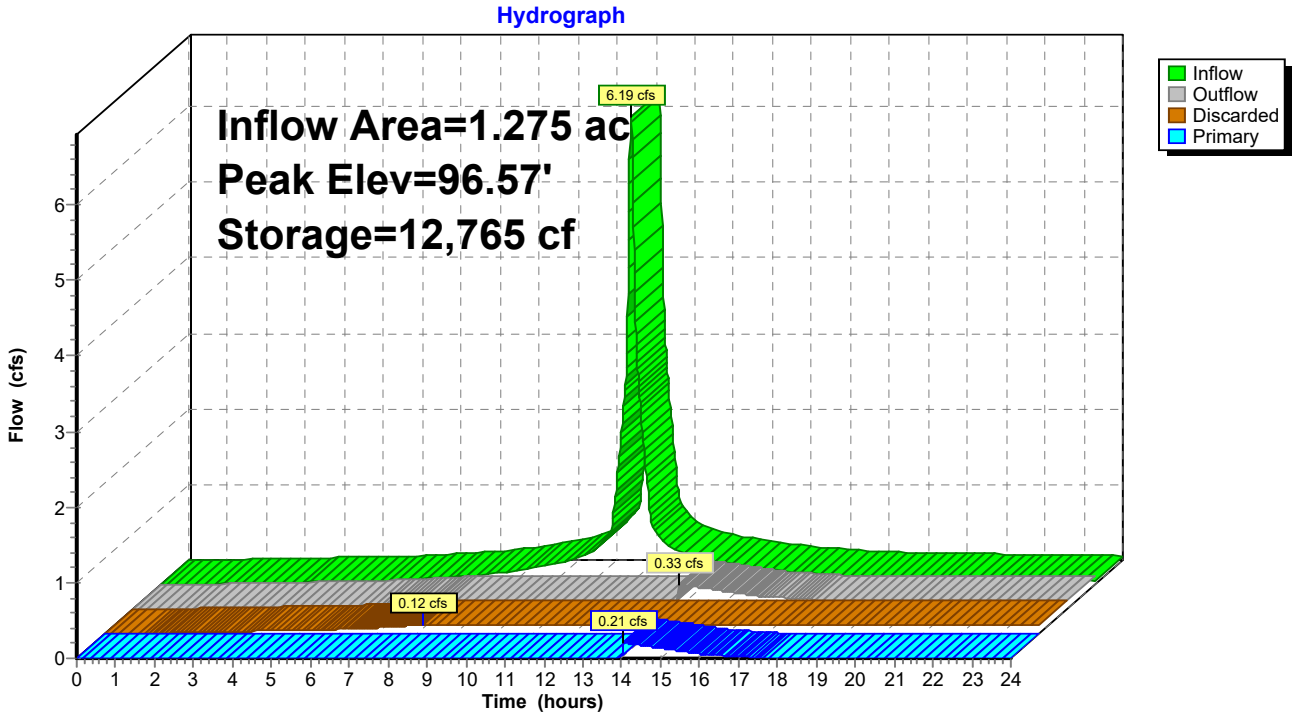
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.00' / 95.90' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	93.00'	**1.080 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	96.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.12 cfs @ 8.19 hrs HW=93.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.20 cfs @ 14.04 hrs HW=96.57' (Free Discharge)
└**1=Culvert** (Passes 0.20 cfs of 0.89 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.74 fps)

Pond INF-5: Infiltration Sys #5 - Retain-It

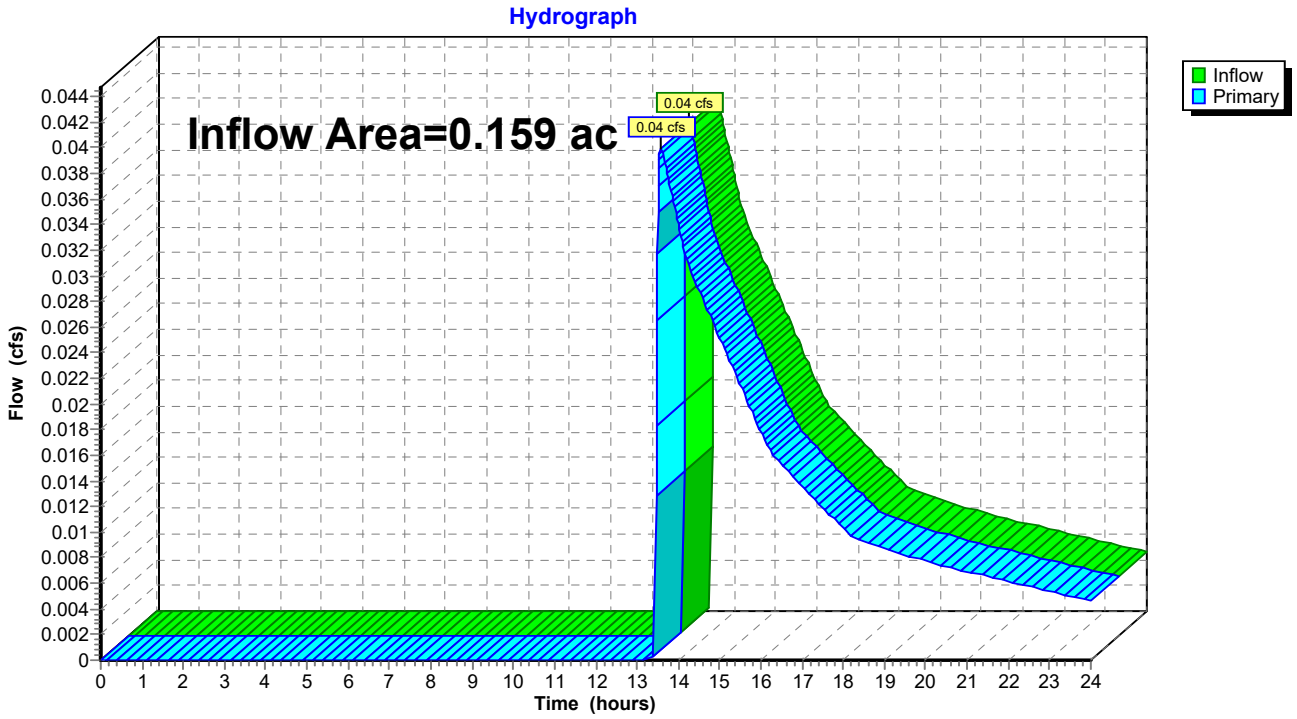


Summary for Link DP1: DEDHAM ST CB

Inflow Area = 0.159 ac, 0.00% Impervious, Inflow Depth > 0.87" for 10-year event
Inflow = 0.04 cfs @ 13.58 hrs, Volume= 0.012 af
Primary = 0.04 cfs @ 13.58 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP1: DEDHAM ST CB

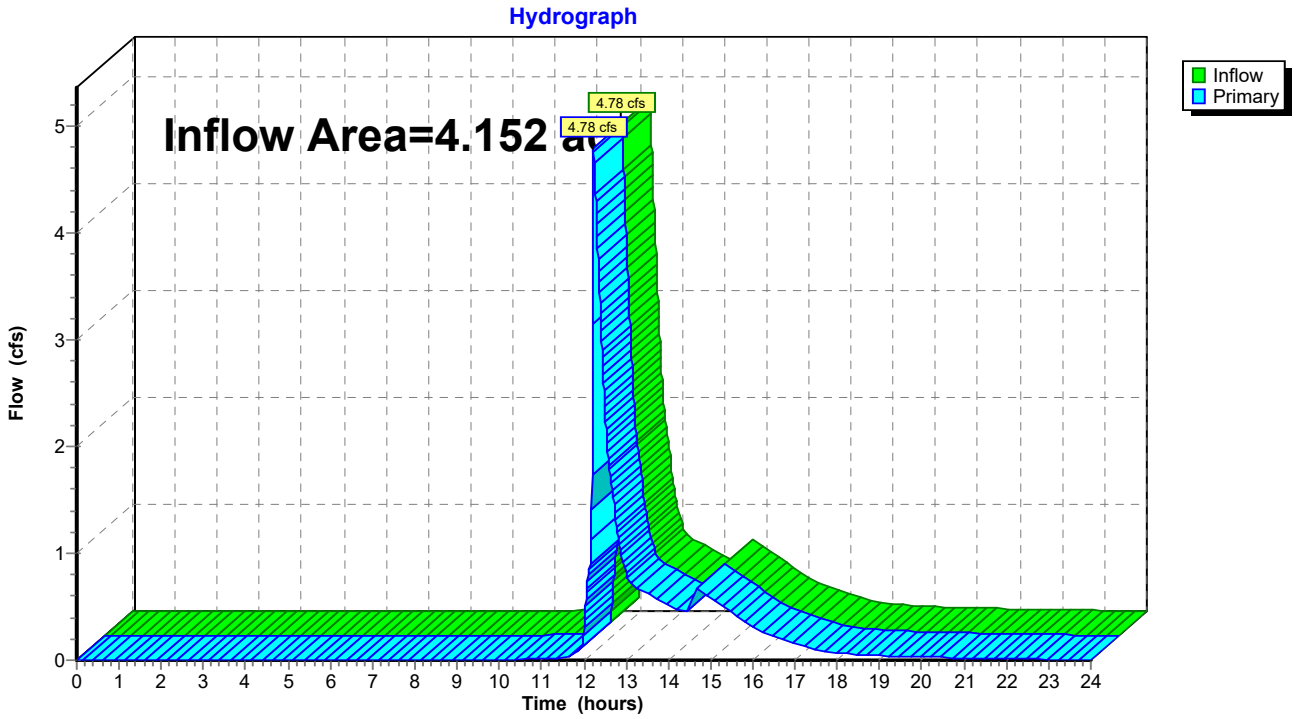


Summary for Link DP2: 2ND ST CB

Inflow Area = 4.152 ac, 66.94% Impervious, Inflow Depth > 0.99" for 10-year event
Inflow = 4.78 cfs @ 12.21 hrs, Volume= 0.341 af
Primary = 4.78 cfs @ 12.21 hrs, Volume= 0.341 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP2: 2ND ST CB

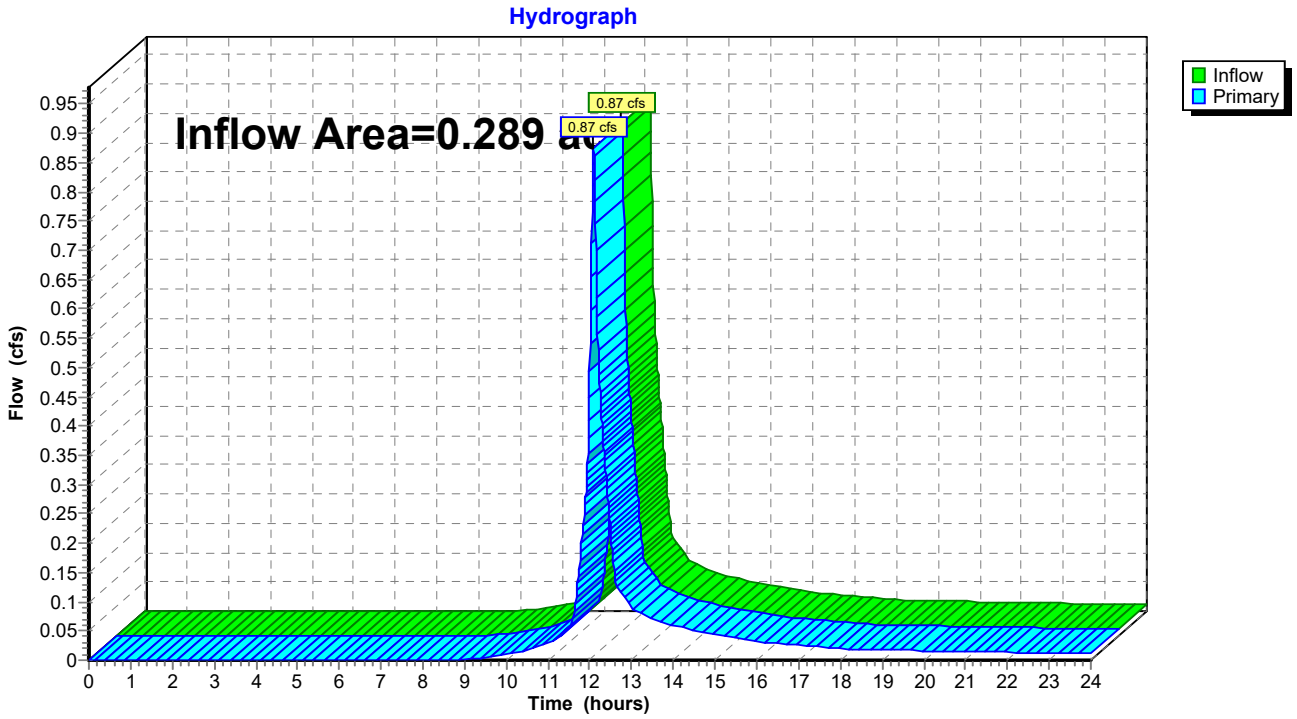


Summary for Link DP3: FLOODPLAIN OVERFLOW

Inflow Area = 0.289 ac, 0.00% Impervious, Inflow Depth > 2.58" for 10-year event
Inflow = 0.87 cfs @ 12.09 hrs, Volume= 0.062 af
Primary = 0.87 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP3: FLOODPLAIN OVERFLOW



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP1: Runoff Area=6,924 sf 0.00% Impervious Runoff Depth>5.41"
Flow Length=200' Tc=11.9 min CN=76 Runoff=0.83 cfs 0.072 af

SubcatchmentP10: Runoff Area=21,889 sf 34.39% Impervious Runoff Depth>6.73"
Tc=6.0 min CN=87 Runoff=3.77 cfs 0.282 af

SubcatchmentP11: Runoff Area=12,600 sf 0.00% Impervious Runoff Depth>5.18"
Tc=6.0 min CN=74 Runoff=1.75 cfs 0.125 af

SubcatchmentP2: Runoff Area=17,496 sf 14.09% Impervious Runoff Depth>5.77"
Tc=6.0 min CN=79 Runoff=2.68 cfs 0.193 af

SubcatchmentP3: Runoff Area=3,391 sf 0.00% Impervious Runoff Depth>5.77"
Tc=6.0 min CN=79 Runoff=0.52 cfs 0.037 af

SubcatchmentP4: Runoff Area=17,366 sf 100.00% Impervious Runoff Depth>8.04"
Tc=6.0 min CN=98 Runoff=3.25 cfs 0.267 af

SubcatchmentP5: Runoff Area=30,376 sf 44.36% Impervious Runoff Depth>6.84"
Flow Length=380' Tc=11.1 min CN=88 Runoff=4.50 cfs 0.397 af

SubcatchmentP6: Runoff Area=53,169 sf 87.60% Impervious Runoff Depth>7.67"
Flow Length=564' Tc=16.3 min CN=95 Runoff=7.27 cfs 0.780 af

SubcatchmentP7: Runoff Area=2,338 sf 0.00% Impervious Runoff Depth>5.89"
Tc=6.0 min CN=80 Runoff=0.36 cfs 0.026 af

SubcatchmentP8: Runoff Area=1,182 sf 0.00% Impervious Runoff Depth>5.89"
Tc=6.0 min CN=80 Runoff=0.18 cfs 0.013 af

SubcatchmentP9: Runoff Area=33,650 sf 100.00% Impervious Runoff Depth>8.04"
Tc=6.0 min CN=98 Runoff=6.29 cfs 0.518 af

Pond 3: DMH-3 Peak Elev=109.49' Inflow=11.54 cfs 1.092 af
12.0" Round Culvert n=0.010 L=12.0' S=0.0050 '/' Outflow=11.54 cfs 1.092 af

Pond INF-1: Infiltration Sys #1 - Perf. Pipe Peak Elev=98.53' Storage=1,011 cf Inflow=0.83 cfs 0.072 af
Discarded=0.00 cfs 0.002 af Primary=1.23 cfs 0.059 af Outflow=1.23 cfs 0.062 af

Pond INF-2: Infiltration Sys #2 - Retain-It Peak Elev=97.17' Storage=10,122 cf Inflow=5.93 cfs 0.460 af
Discarded=0.12 cfs 0.177 af Primary=0.81 cfs 0.070 af Outflow=0.92 cfs 0.247 af

Pond INF-3: Infiltration Sys #3 - Retain-It Peak Elev=98.91' Storage=7,447 cf Inflow=7.55 cfs 0.888 af
Discarded=0.18 cfs 0.135 af Primary=5.90 cfs 0.656 af Outflow=6.08 cfs 0.791 af

Pond INF-4: Infiltration Sys #4 - Retain-It Peak Elev=99.08' Storage=7,788 cf Inflow=8.90 cfs 0.699 af
Discarded=0.18 cfs 0.098 af Primary=5.65 cfs 0.436 af Outflow=5.82 cfs 0.534 af

Pond INF-5: Infiltration Sys #5 - Retain-It Peak Elev=98.73' Storage=13,839 cf Inflow=10.06 cfs 0.799 af
Discarded=0.35 cfs 0.209 af Primary=4.45 cfs 0.301 af Outflow=4.80 cfs 0.510 af

Link DP1: DEDHAM ST CB Inflow=1.23 cfs 0.059 af
Primary=1.23 cfs 0.059 af

Link DP2: 2ND ST DMH Inflow=11.78 cfs 1.131 af
Primary=11.78 cfs 1.131 af

Link DP3: FLOODPLAIN OVERFLOW Inflow=1.75 cfs 0.125 af
Primary=1.75 cfs 0.125 af

Total Runoff Area = 4.600 ac Runoff Volume = 2.712 af Average Runoff Depth = 7.07"
39.58% Pervious = 1.821 ac 60.42% Impervious = 2.779 ac

Summary for Subcatchment P1:

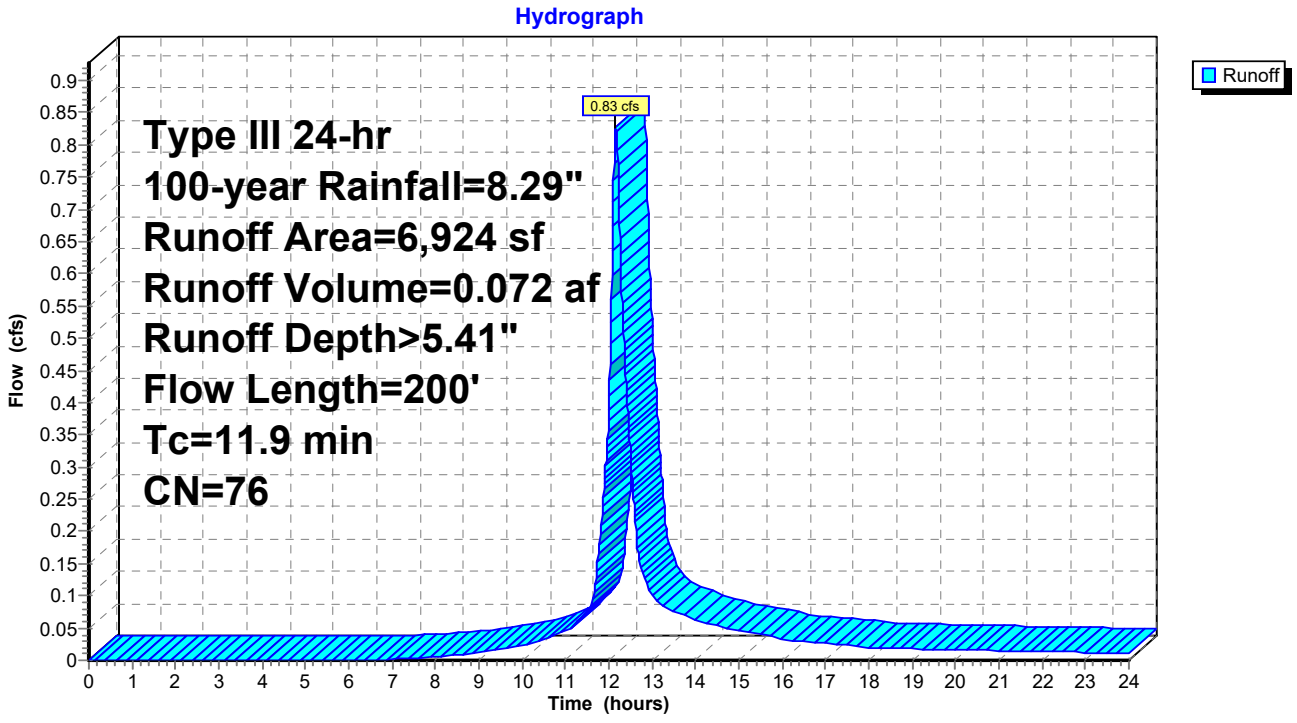
Runoff = 0.83 cfs @ 12.16 hrs, Volume= 0.072 af, Depth> 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
6,400	74	>75% Grass cover, Good, HSG C
524	96	Gravel surface, HSG C
6,924	76	Weighted Average
6,924		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0130	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
0.4	44	0.0130	1.71		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
0.1	56	0.3330	8.66		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
11.9	200	Total			

Subcatchment P1:



Summary for Subcatchment P10:

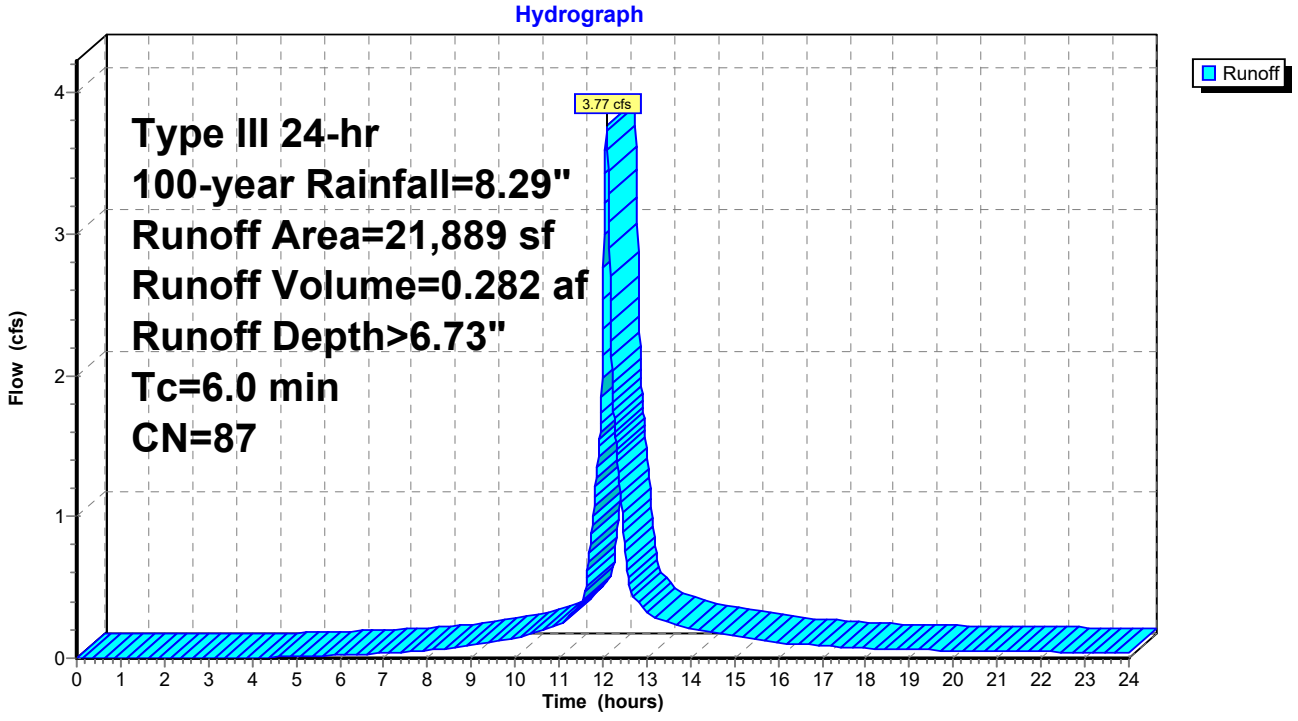
Runoff = 3.77 cfs @ 12.08 hrs, Volume= 0.282 af, Depth> 6.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

	Area (sf)	CN	Description
*	7,528	98	Patio Area
	13,700	80	>75% Grass cover, Good, HSG D
	661	96	Gravel surface, HSG C
	21,889	87	Weighted Average
	14,361		65.61% Pervious Area
	7,528		34.39% Impervious Area

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

Subcatchment P10:



Summary for Subcatchment P11:

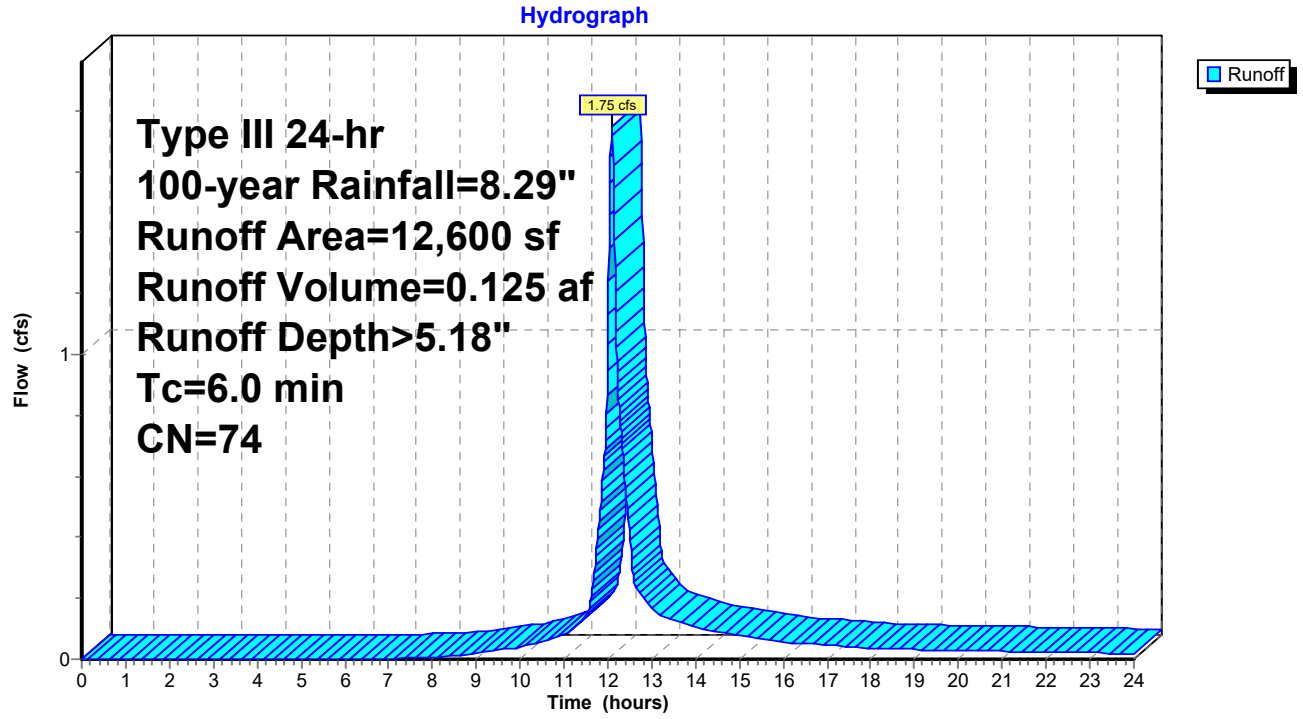
Runoff = 1.75 cfs @ 12.09 hrs, Volume= 0.125 af, Depth> 5.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
12,600	74	>75% Grass cover, Good, HSG C
12,600		100.00% Pervious Area

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

Subcatchment P11:



Summary for Subcatchment P2:

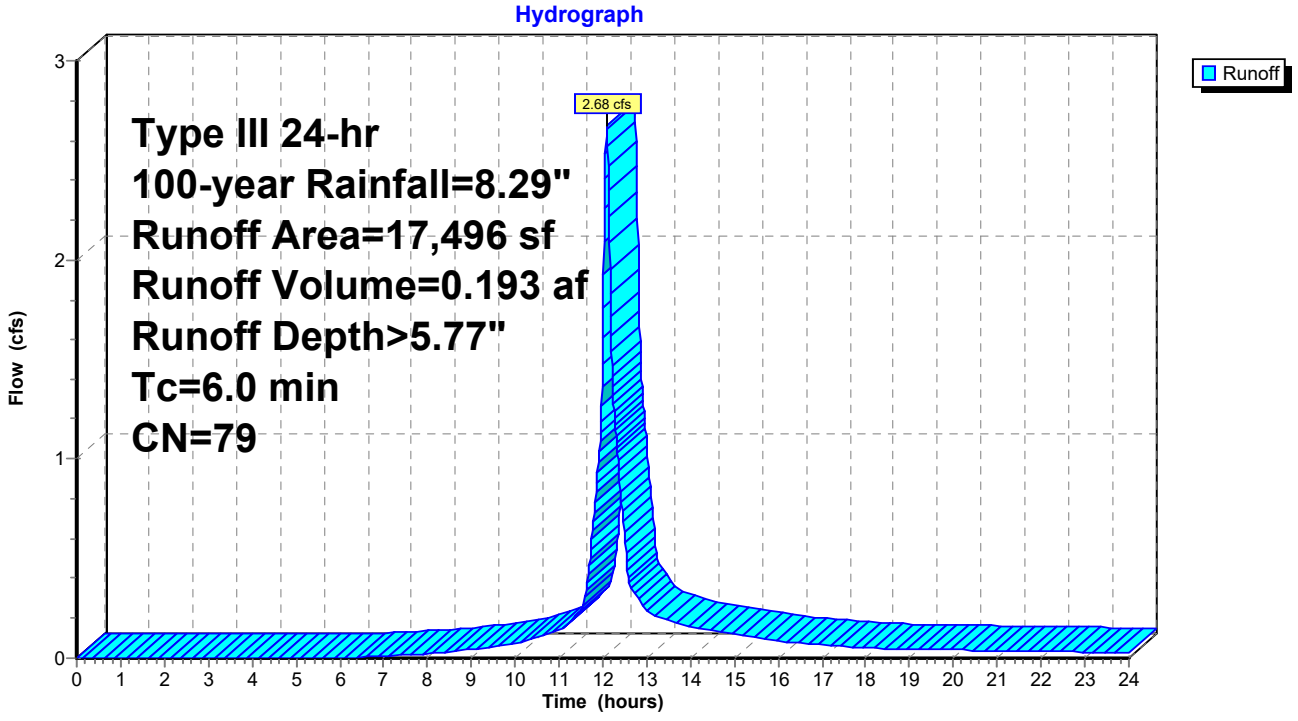
Runoff = 2.68 cfs @ 12.09 hrs, Volume= 0.193 af, Depth> 5.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

	Area (sf)	CN	Description
*	2,466	98	Patio Area
	13,800	74	>75% Grass cover, Good, HSG C
*	1,230	96	Gravel Path Area
	17,496	79	Weighted Average
	15,030		85.91% Pervious Area
	2,466		14.09% Impervious Area

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

Subcatchment P2:



Summary for Subcatchment P3:

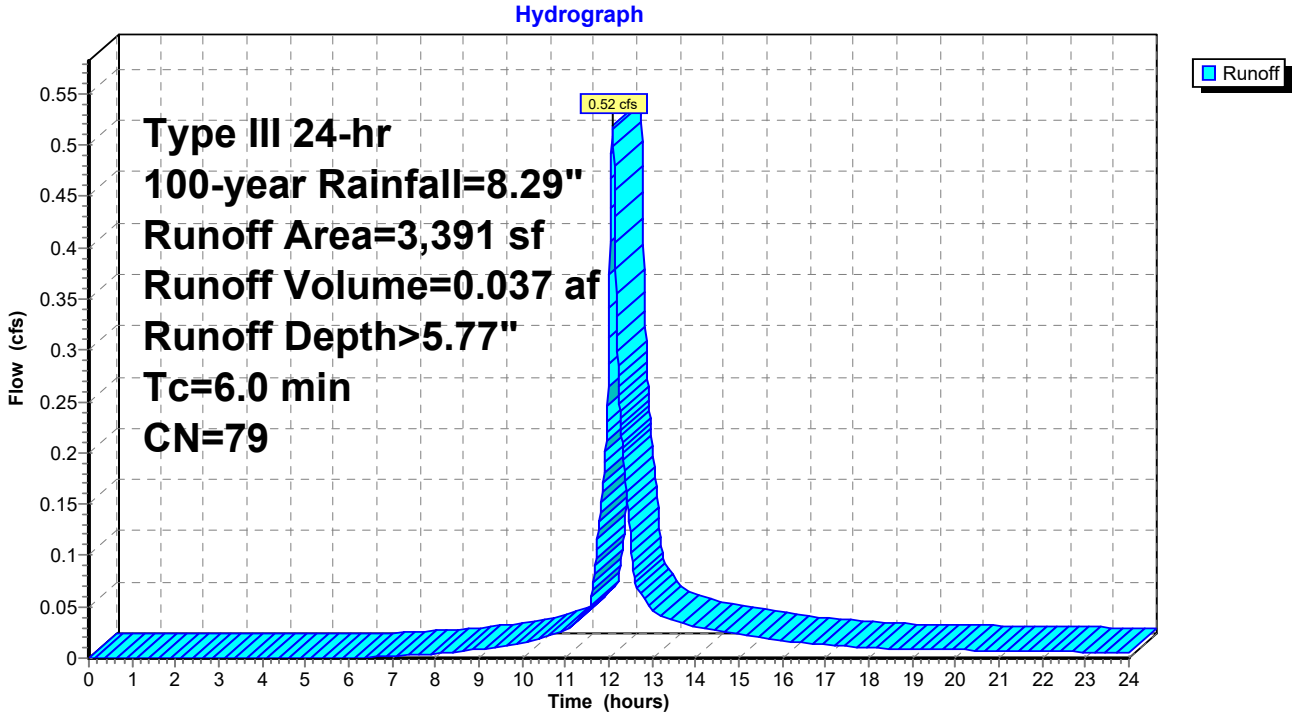
Runoff = 0.52 cfs @ 12.09 hrs, Volume= 0.037 af, Depth> 5.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

	Area (sf)	CN	Description
*	726	96	Gravel Path Area
	2,665	74	>75% Grass cover, Good, HSG C
	3,391	79	Weighted Average
	3,391		100.00% Pervious Area

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

Subcatchment P3:



Summary for Subcatchment P4:

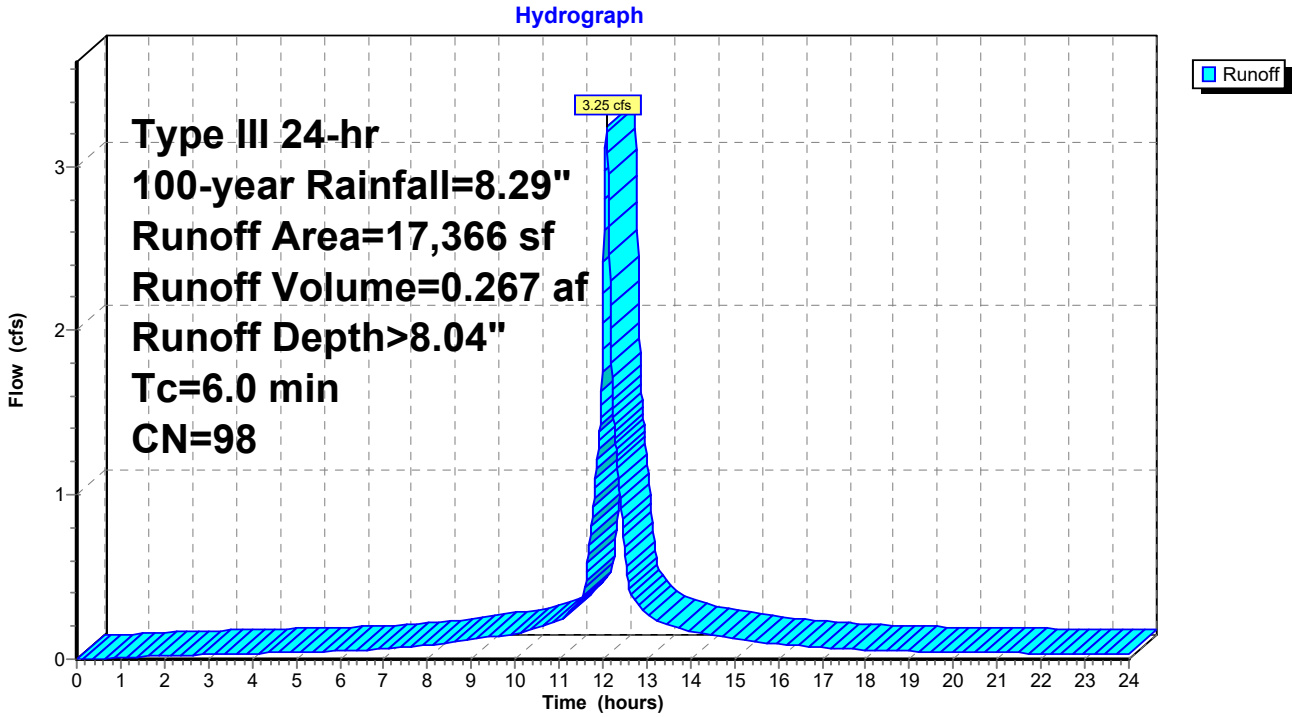
Runoff = 3.25 cfs @ 12.08 hrs, Volume= 0.267 af, Depth> 8.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
17,366	98	Roofs, HSG C
17,366		100.00% Impervious Area

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

Subcatchment P4:



Summary for Subcatchment P5:

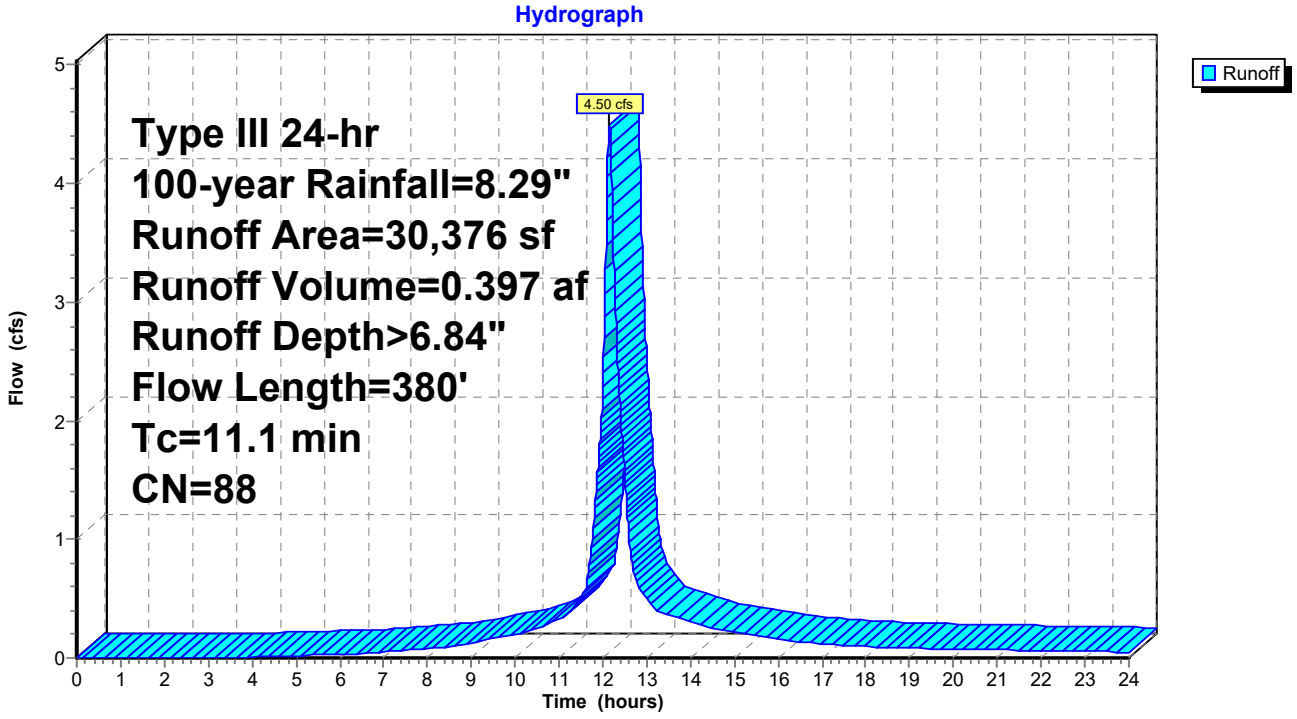
Runoff = 4.50 cfs @ 12.15 hrs, Volume= 0.397 af, Depth> 6.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
13,476	98	Paved roads w/curbs & sewers, HSG D
16,900	80	>75% Grass cover, Good, HSG D
30,376	88	Weighted Average
16,900		55.64% Pervious Area
13,476		44.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	25	0.3300	0.41		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
8.9	65	0.0100	0.12		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
1.2	290	0.0050	4.17	3.28	**Pipe Channel, Pipe Flow** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.010 PVC, smooth interior
11.1	380	Total			

Subcatchment P5:



Summary for Subcatchment P6:

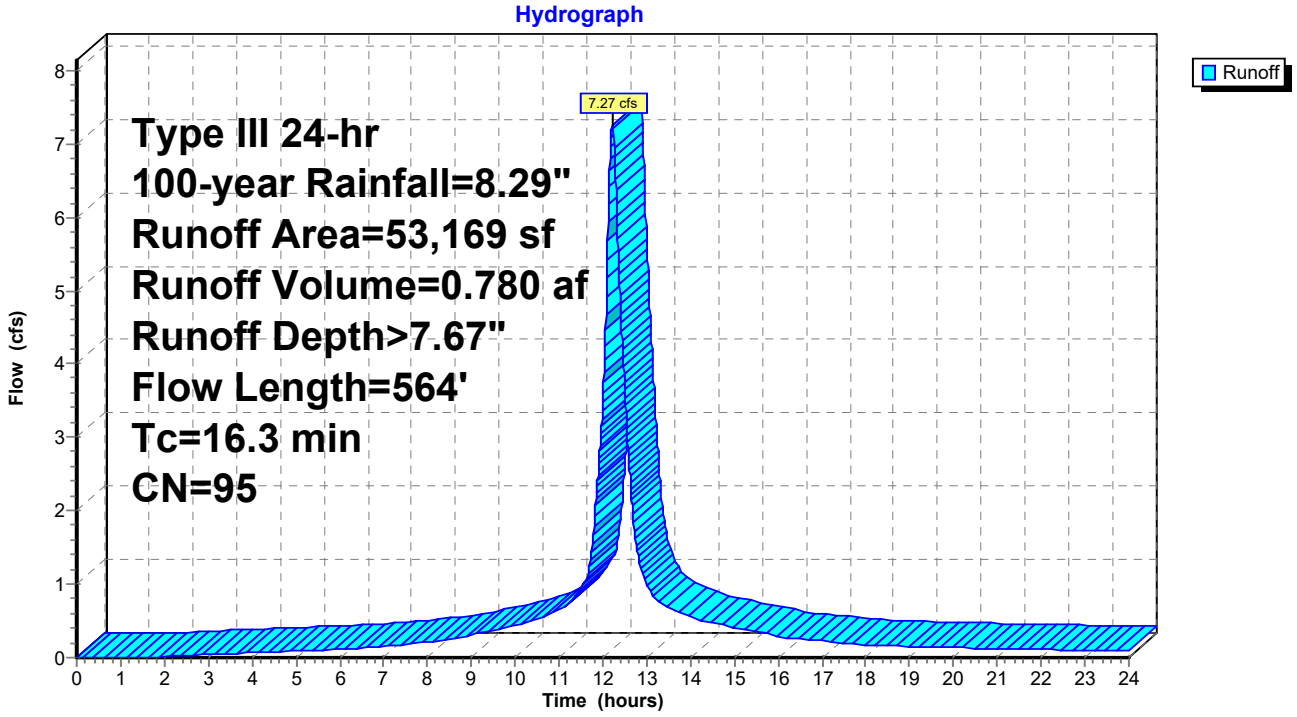
Runoff = 7.27 cfs @ 12.21 hrs, Volume= 0.780 af, Depth> 7.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

	Area (sf)	CN	Description
	45,865	98	Roofs, HSG C
*	711	98	Conc Path
	6,593	74	>75% Grass cover, Good, HSG C
	53,169	95	Weighted Average
	6,593		12.40% Pervious Area
	46,576		87.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0090	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.36"
0.4	34	0.0090	1.42		**Shallow Concentrated Flow, Shallow Conc Flow** Grassed Waterway Kv= 15.0 fps
2.7	430	0.0050	2.63	0.52	**Pipe Channel, Pipe Channel Flow** 6.0" Round Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.010 PVC, smooth interior
16.3	564	Total			

Subcatchment P6:



Summary for Subcatchment P7:

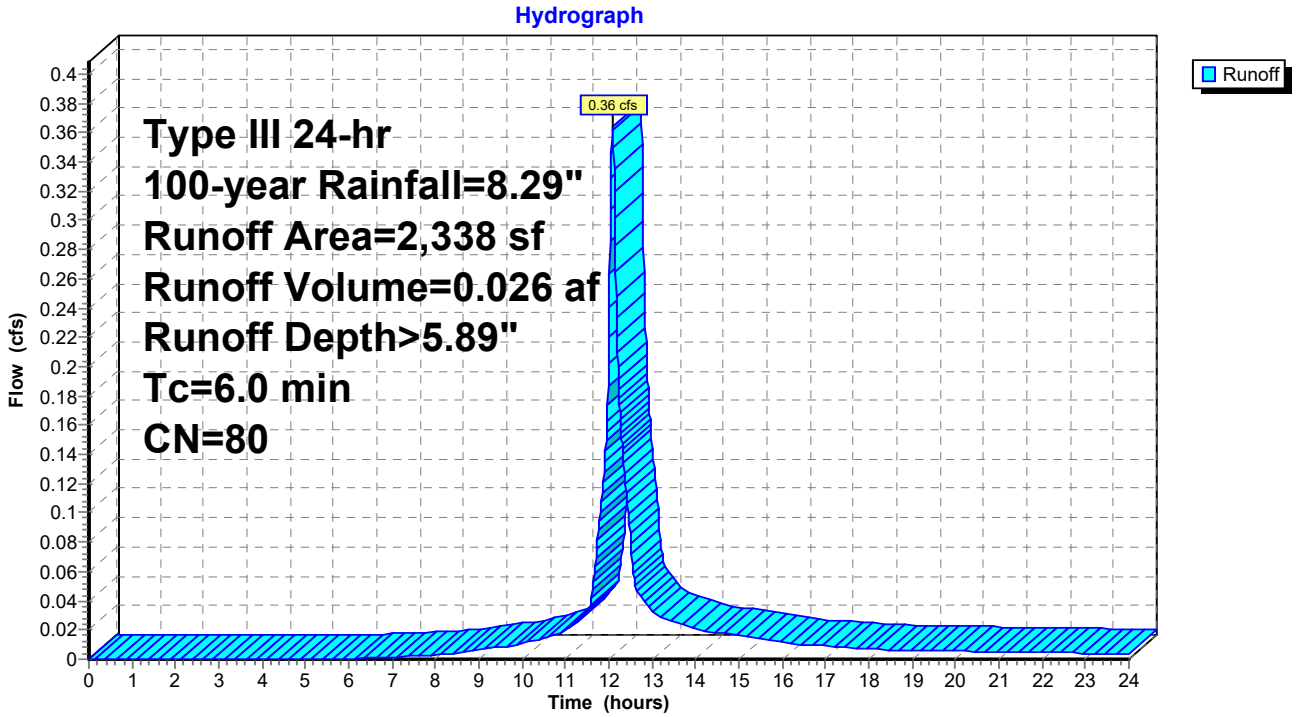
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.026 af, Depth> 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
2,338	80	>75% Grass cover, Good, HSG D
2,338		100.00% Pervious Area

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

Subcatchment P7:



Summary for Subcatchment P8:

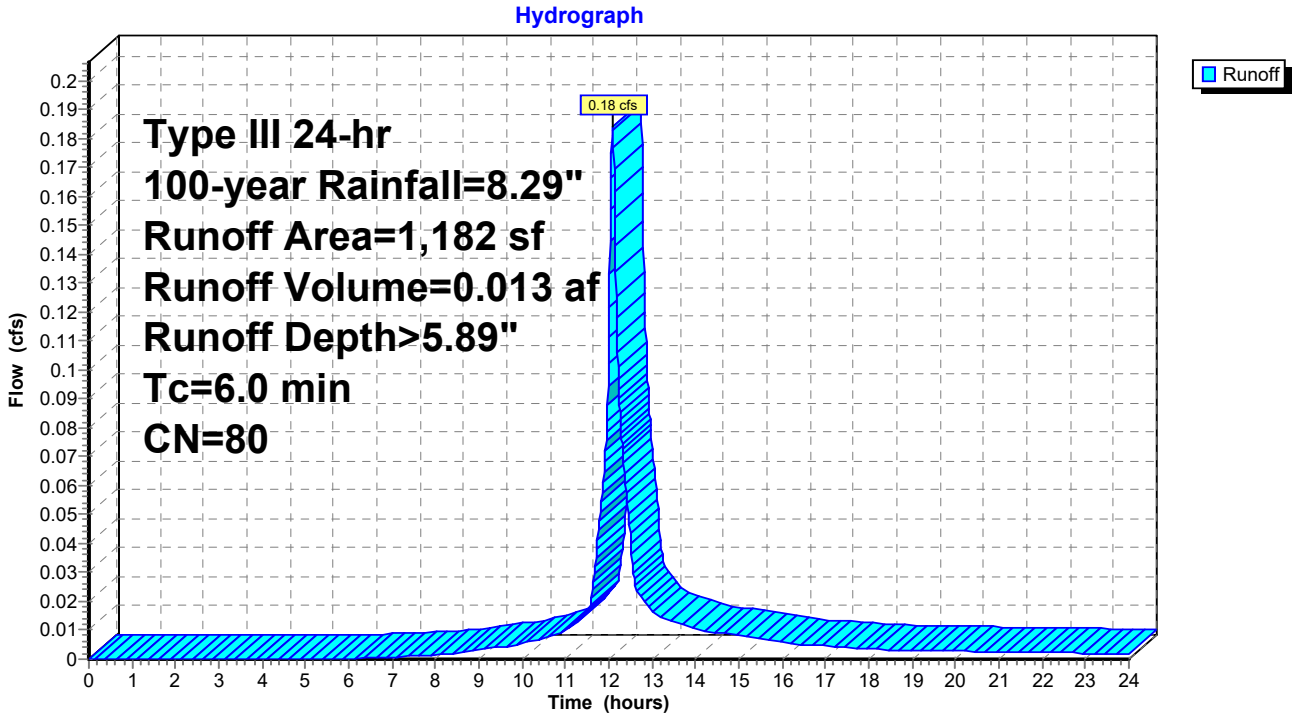
Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.013 af, Depth> 5.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
1,182	80	>75% Grass cover, Good, HSG D
1,182		100.00% Pervious Area

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

Subcatchment P8:



Summary for Subcatchment P9:

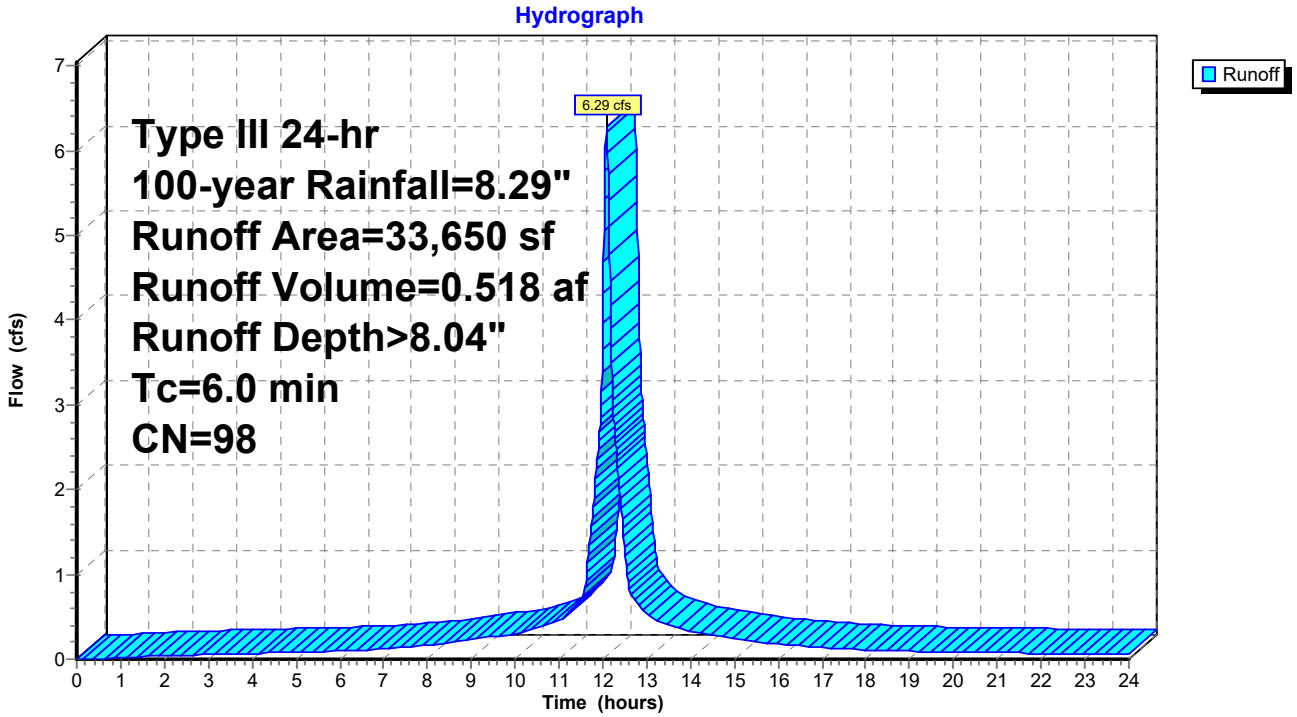
Runoff = 6.29 cfs @ 12.08 hrs, Volume= 0.518 af, Depth> 8.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.29"

Area (sf)	CN	Description
33,650	98	Roofs, HSG A
33,650		100.00% Impervious Area

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

Subcatchment P9:



Summary for Pond 3: DMH-3

[57] Hint: Peaked at 109.49' (Flood elevation advised)
[81] Warning: Exceeded Pond INF-3 by 10.60' @ 12.28 hrs
[81] Warning: Exceeded Pond INF-4 by 10.41' @ 12.28 hrs

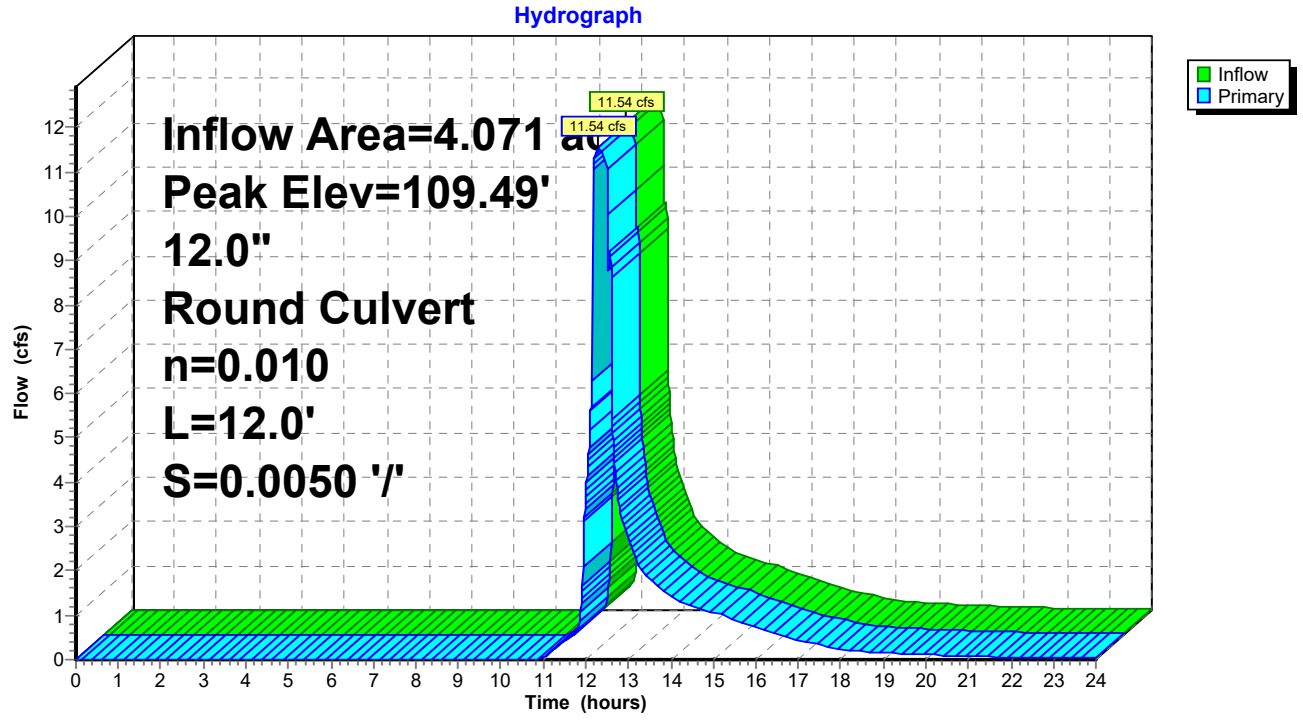
Inflow Area = 4.071 ac, 68.27% Impervious, Inflow Depth > 3.22" for 100-year event
Inflow = 11.54 cfs @ 12.28 hrs, Volume= 1.092 af
Outflow = 11.54 cfs @ 12.28 hrs, Volume= 1.092 af, Atten= 0%, Lag= 0.0 min
Primary = 11.54 cfs @ 12.28 hrs, Volume= 1.092 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 109.49' @ 12.28 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.06' / 94.00' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=11.53 cfs @ 12.28 hrs HW=109.48' (Free Discharge)
↑**1=Culvert** (Inlet Controls 11.53 cfs @ 14.68 fps)

Pond 3: DMH-3



Summary for Pond INF-1: Infiltration Sys #1 - Perf. Pipe

[93] Warning: Storage range exceeded by 1.74'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area =	0.159 ac,	0.00% Impervious,	Inflow Depth >	5.41"	for 100-year event
Inflow =	0.83 cfs @	12.16 hrs,	Volume=	0.072 af	
Outflow =	1.23 cfs @	12.17 hrs,	Volume=	0.062 af,	Atten= 0%, Lag= 0.5 min
Discarded =	0.00 cfs @	7.77 hrs,	Volume=	0.002 af	
Primary =	1.23 cfs @	12.17 hrs,	Volume=	0.059 af	

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.53' @ 12.17 hrs Surf.Area= 754 sf Storage= 1,011 cf

Plug-Flow detention time= 93.8 min calculated for 0.062 af (86% of inflow)
Center-of-Mass det. time= 32.9 min (847.6 - 814.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.00'	469 cf	**12.17'W x 62.00'L x 2.79'H Field A** 2,106 cf Overall - 542 cf Embedded = 1,564 cf x 30.0% Voids
#2A	94.50'	542 cf	**CPP single-wall 18"** x 12 Inside #1 Inside= 18.0"W x 18.0"H => 2.26 sf x 20.00'L = 45.1 cf Outside= 21.5"W x 21.5"H => 2.26 sf x 20.00'L = 45.1 cf 12 Chambers in 4 Rows
		1,011 cf	Total Available Storage

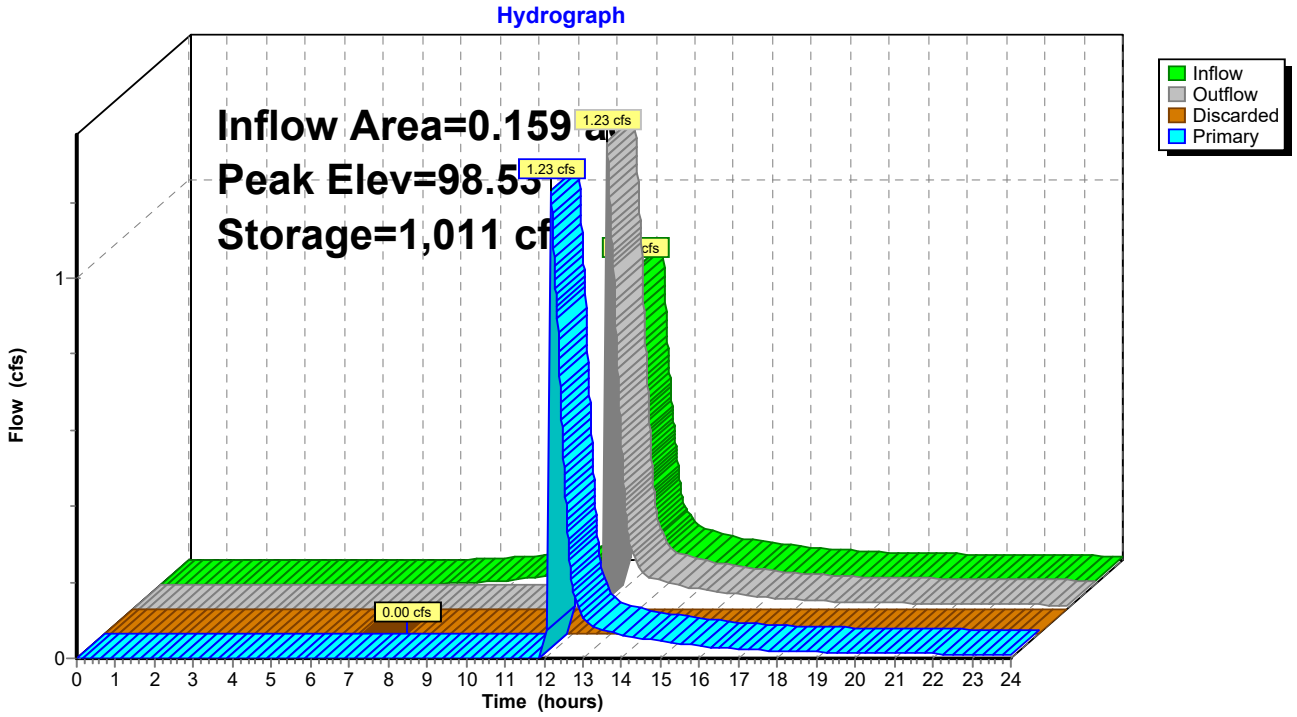
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	95.57'	**6.0" Round Culvert** L= 50.0' Ke= 0.900 Inlet / Outlet Invert= 95.57' / 95.00' S= 0.0114 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Discarded	94.00'	**0.090 in/hr Exfiltration over Surface area**
#3	Device 1	96.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 7.77 hrs HW=94.03' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=1.23 cfs @ 12.17 hrs HW=98.53' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.23 cfs @ 6.25 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 1.23 cfs of 31.45 cfs potential flow)

Pond INF-1: Infiltration Sys #1 - Perf. Pipe



Summary for Pond INF-2: Infiltration Sys #2 - Retain-It

[42] Hint: Gap in defined storage above volume #1 at 97.67'

Inflow Area = 0.800 ac, 56.89% Impervious, Inflow Depth > 6.90" for 100-year event
Inflow = 5.93 cfs @ 12.08 hrs, Volume= 0.460 af
Outflow = 0.92 cfs @ 12.57 hrs, Volume= 0.247 af, Atten= 84%, Lag= 28.9 min
Discarded = 0.12 cfs @ 8.42 hrs, Volume= 0.177 af
Primary = 0.81 cfs @ 12.57 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 97.17' @ 12.57 hrs Surf.Area= 4,628 sf Storage= 10,122 cf

Plug-Flow detention time= 214.4 min calculated for 0.247 af (54% of inflow)
Center-of-Mass det. time= 95.7 min (862.3 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1B	94.00'	1,078 cf	**26.00'W x 178.00'L x 3.67'H Field B** 16,969 cf Overall - 13,376 cf Embedded = 3,593 cf x 30.0% Voids
#2B	94.50'	9,104 cf	**retain_it retain_it 2.5'** x 66 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 3 Rows adjusted for 165.0 cf perimeter wall
#3	97.67'	3 cf	**2.00'D x 0.83'H Vertical Cone/Cylinder** Impervious
#4	98.50'	4,113 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		14,297 cf	Total Available Storage

Storage Group B created with Chamber Wizard

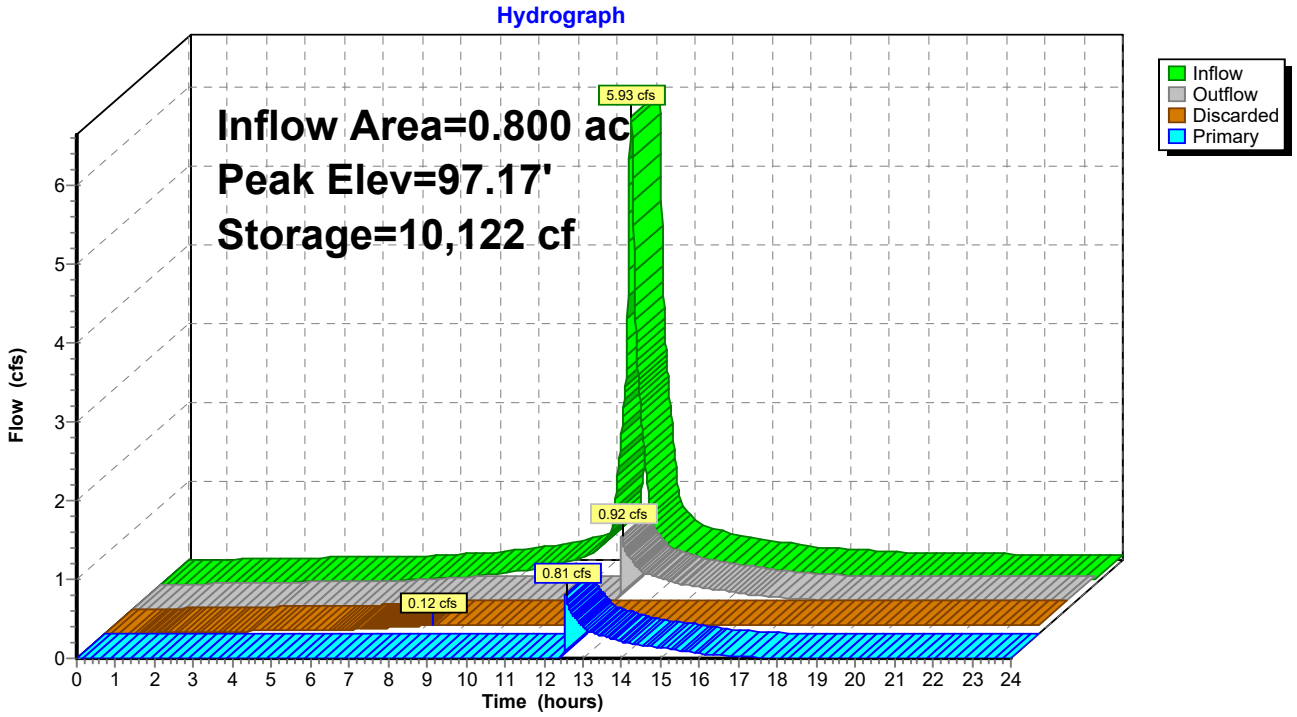
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	50	0	0
99.00	16,400	4,113	4,113

Device	Routing	Invert	Outlet Devices
#1	Primary	96.10'	**12.0" Round Culvert** L= 7.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.10' / 95.95' S= 0.0214 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	94.00'	**1.080 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	97.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.12 cfs @ 8.42 hrs HW=94.05' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.80 cfs @ 12.57 hrs HW=97.17' (Free Discharge)
└**1=Culvert** (Passes 0.80 cfs of 2.26 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.80 cfs @ 1.16 fps)

Pond INF-2: Infiltration Sys #2 - Retain-It



Summary for Pond INF-3: Infiltration Sys #3 - Retain-It

[81] Warning: Exceeded Pond INF-2 by 2.56' @ 12.10 hrs

Inflow Area = 2.099 ac, 72.64% Impervious, Inflow Depth > 5.08" for 100-year event
Inflow = 7.55 cfs @ 12.21 hrs, Volume= 0.888 af
Outflow = 6.08 cfs @ 12.33 hrs, Volume= 0.791 af, Atten= 19%, Lag= 7.1 min
Discarded = 0.18 cfs @ 12.33 hrs, Volume= 0.135 af
Primary = 5.90 cfs @ 12.33 hrs, Volume= 0.656 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 98.91' @ 12.33 hrs Surf.Area= 7,194 sf Storage= 7,447 cf

Plug-Flow detention time= 93.6 min calculated for 0.791 af (89% of inflow)
Center-of-Mass det. time= 44.1 min (815.2 - 771.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.00'	812 cf	**18.00'W x 170.00'L x 3.67'H Field A** 11,220 cf Overall - 8,512 cf Embedded = 2,708 cf x 30.0% Voids
#2A	94.50'	5,747 cf	**retain_it retain_it 2.5'** x 42 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 2 Rows adjusted for 151.8 cf perimeter wall
#3	97.00'	39 cf	**2.50'D x 2.00'H Vertical Cone/Cylinder** x 4
#4	98.50'	1,255 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		7,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

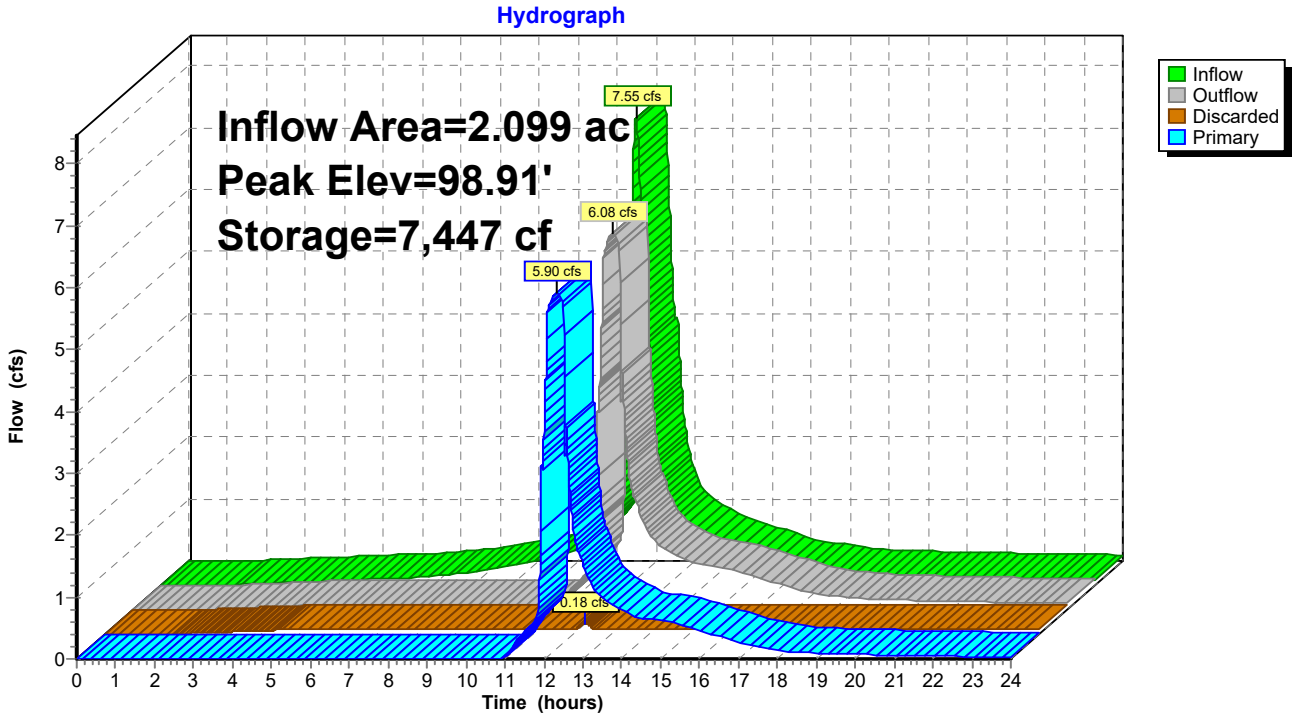
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	20	0	0
99.00	5,000	1,255	1,255

Device	Routing	Invert	Outlet Devices
#1	Primary	94.50'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.50' / 94.30' S= 0.0250 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	94.00'	**1.080 in/hr Exfiltration over Surface area**
#3	Device 1	96.80'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	96.00'	**4.0" Vert. Orifice/Grate X 2.00** C= 0.600

Discarded OutFlow Max=0.18 cfs @ 12.33 hrs HW=98.91' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=5.90 cfs @ 12.33 hrs HW=98.91' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.90 cfs @ 7.52 fps)
└**3=Broad-Crested Rectangular Weir** (Passes < 40.73 cfs potential flow)
└**4=Orifice/Grate** (Passes < 1.39 cfs potential flow)

Pond INF-3: Infiltration Sys #3 - Retain-It



Summary for Pond INF-4: Infiltration Sys #4 - Retain-It

[42] Hint: Gap in defined storage above volume #1 at 97.17'
[93] Warning: Storage range exceeded by 0.08'
[81] Warning: Exceeded Pond INF-5 by 2.02' @ 12.54 hrs

Inflow Area = 1.972 ac, 63.61% Impervious, Inflow Depth > 4.25" for 100-year event
Inflow = 8.90 cfs @ 12.15 hrs, Volume= 0.699 af
Outflow = 5.82 cfs @ 12.28 hrs, Volume= 0.534 af, Atten= 35%, Lag= 7.7 min
Discarded = 0.18 cfs @ 12.28 hrs, Volume= 0.098 af
Primary = 5.65 cfs @ 12.28 hrs, Volume= 0.436 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 99.08' @ 12.28 hrs Surf.Area= 7,048 sf Storage= 7,788 cf

Plug-Flow detention time= 98.2 min calculated for 0.534 af (76% of inflow)
Center-of-Mass det. time= 32.6 min (824.5 - 791.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.00'	651 cf	**26.00'W x 98.00'L x 4.17'H Field A** 10,617 cf Overall - 8,448 cf Embedded = 2,169 cf x 30.0% Voids
#2A	93.50'	6,000 cf	**retain_it retain_it 3.0'** x 36 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 3 Rows adjusted for 141.6 cf perimeter wall
#3	98.50'	1,138 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		7,788 cf	Total Available Storage

Storage Group A created with Chamber Wizard

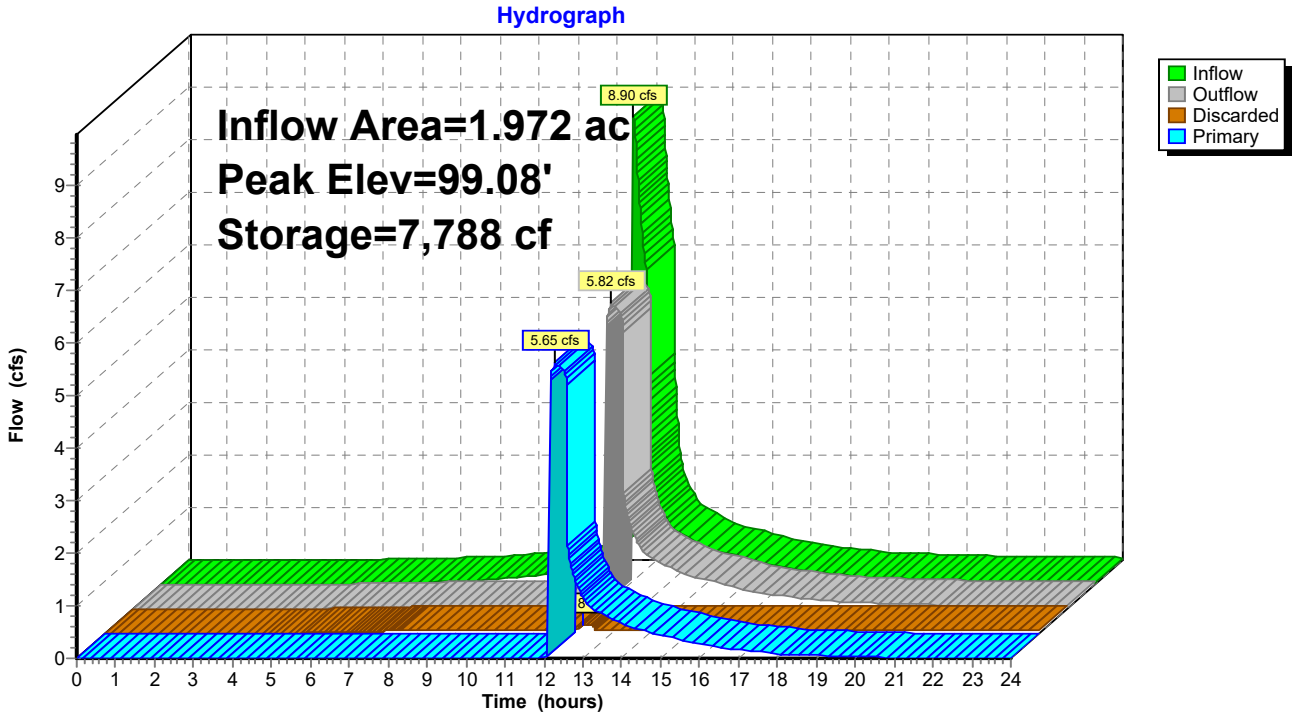
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	50	0	0
99.00	4,500	1,138	1,138

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**12.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.00' / 94.50' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	96.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Discarded	93.00'	**1.080 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.18 cfs @ 12.28 hrs HW=99.08' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=5.64 cfs @ 12.28 hrs HW=99.07' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.64 cfs @ 7.18 fps)
└**2=Broad-Crested Rectangular Weir** (Passes 5.64 cfs of 54.77 cfs potential flow)

Pond INF-4: Infiltration Sys #4 - Retain-It



Summary for Pond INF-5: Infiltration Sys #5 - Retain-It

[42] Hint: Gap in defined storage above volume #1 at 97.17'

Inflow Area = 1.275 ac, 74.14% Impervious, Inflow Depth > 7.52" for 100-year event
Inflow = 10.06 cfs @ 12.08 hrs, Volume= 0.799 af
Outflow = 4.80 cfs @ 12.24 hrs, Volume= 0.510 af, Atten= 52%, Lag= 9.3 min
Discarded = 0.35 cfs @ 12.24 hrs, Volume= 0.209 af
Primary = 4.45 cfs @ 12.24 hrs, Volume= 0.301 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.73' @ 12.24 hrs Surf.Area= 13,812 sf Storage= 13,839 cf

Plug-Flow detention time= 156.2 min calculated for 0.510 af (64% of inflow)
Center-of-Mass det. time= 52.3 min (807.7 - 755.4)

Volume	Invert	Avail.Storage	Storage Description
#1B	93.00'	1,057 cf	**42.00'W x 114.00'L x 4.17'H Field B** 19,950 cf Overall - 16,427 cf Embedded = 3,523 cf x 30.0% Voids
#2B	93.50'	11,763 cf	**retain_it retain_it 3.0'** x 70 Inside #1 Inside= 84.0"W x 36.0"H => 21.33 sf x 8.00'L = 170.6 cf Outside= 96.0"W x 44.0"H => 29.33 sf x 8.00'L = 234.7 cf 5 Rows adjusted for 179.4 cf perimeter wall
#3	98.50'	5,005 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
		17,825 cf	Total Available Storage

Storage Group B created with Chamber Wizard

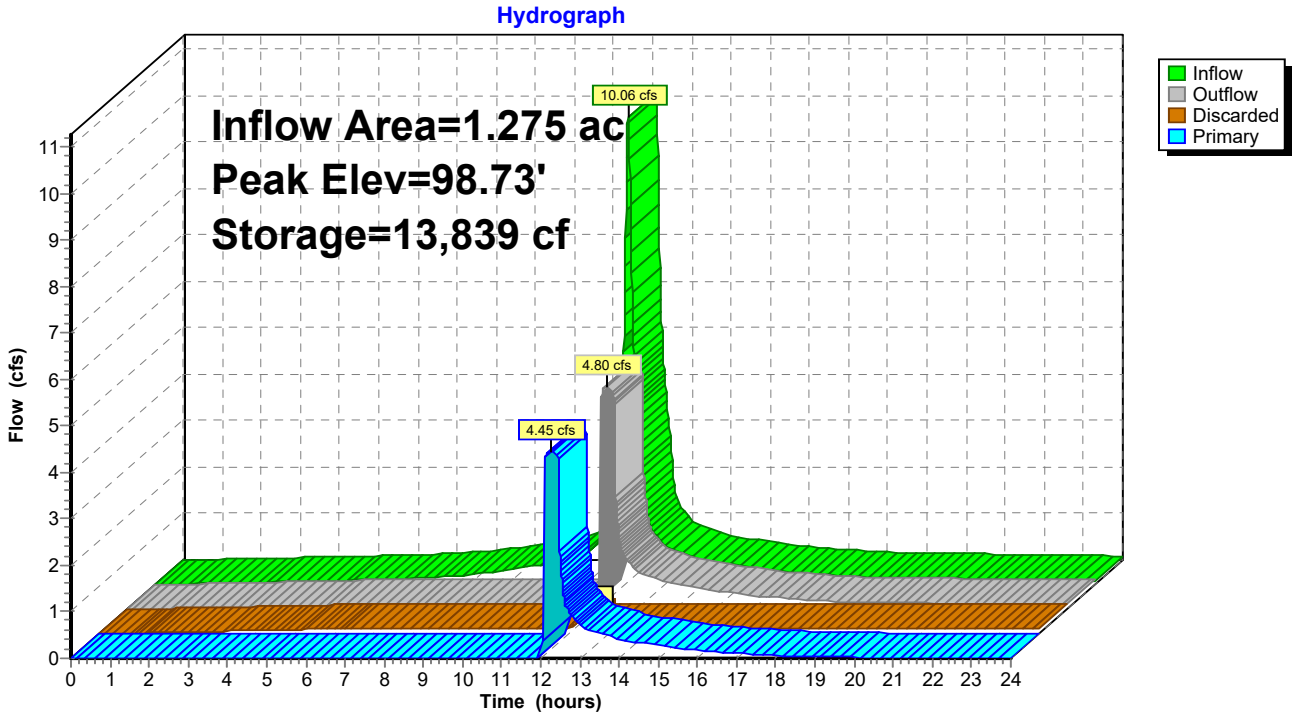
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
98.50	20	0	0
99.00	20,000	5,005	5,005

Device	Routing	Invert	Outlet Devices
#1	Primary	96.00'	**12.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 96.00' / 95.90' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Discarded	93.00'	**1.080 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#3	Device 1	96.50'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.35 cfs @ 12.24 hrs HW=98.73' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.35 cfs)

Primary OutFlow Max=4.45 cfs @ 12.24 hrs HW=98.73' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 4.45 cfs @ 5.67 fps)
↑—**3=Broad-Crested Rectangular Weir** (Passes 4.45 cfs of 44.08 cfs potential flow)

Pond INF-5: Infiltration Sys #5 - Retain-It

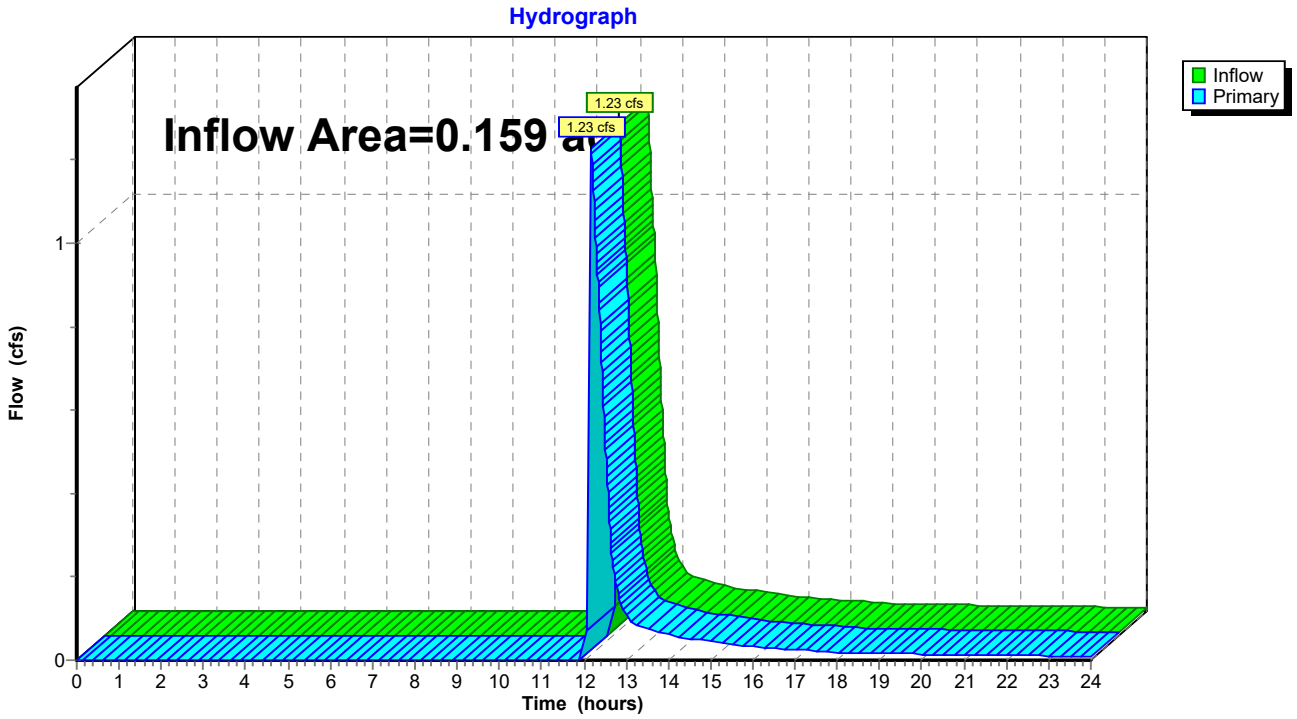


Summary for Link DP1: DEDHAM ST CB

Inflow Area = 0.159 ac, 0.00% Impervious, Inflow Depth > 4.49" for 100-year event
Inflow = 1.23 cfs @ 12.17 hrs, Volume= 0.059 af
Primary = 1.23 cfs @ 12.17 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP1: DEDHAM ST CB

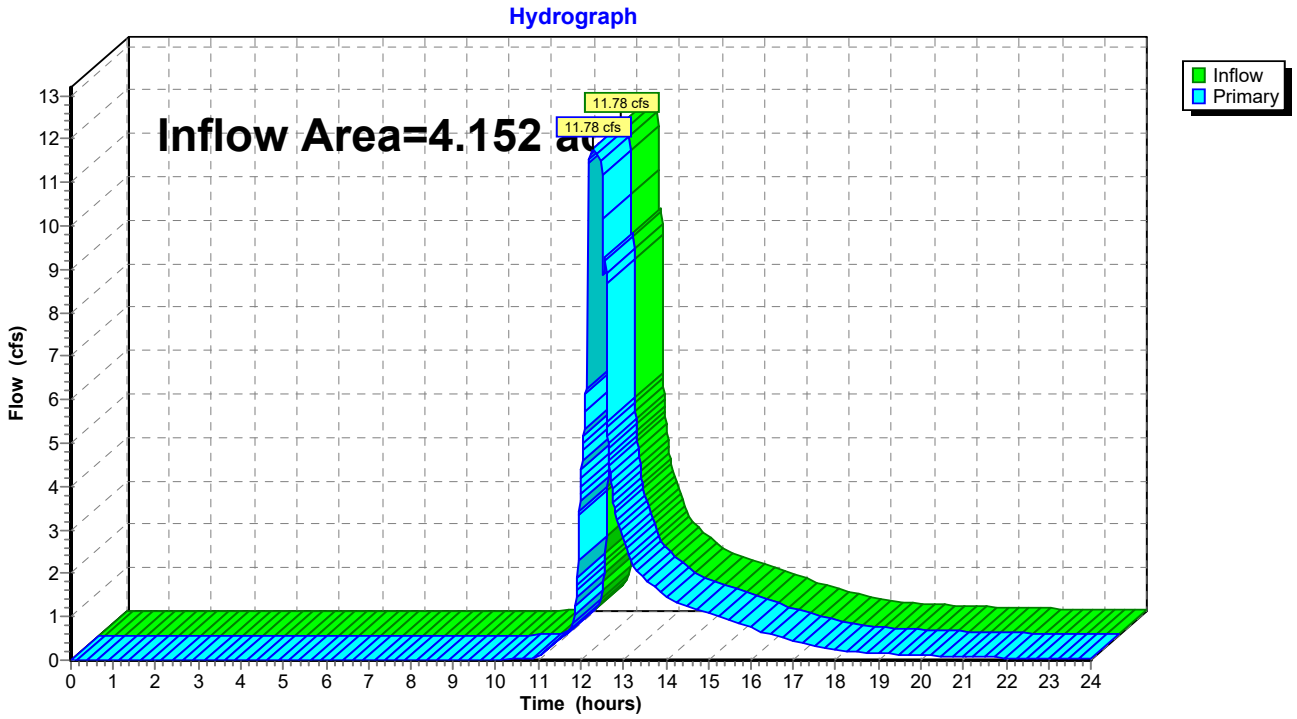


Summary for Link DP2: 2ND ST DMH

Inflow Area = 4.152 ac, 66.94% Impervious, Inflow Depth > 3.27" for 100-year event
Inflow = 11.78 cfs @ 12.28 hrs, Volume= 1.131 af
Primary = 11.78 cfs @ 12.28 hrs, Volume= 1.131 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP2: 2ND ST DMH

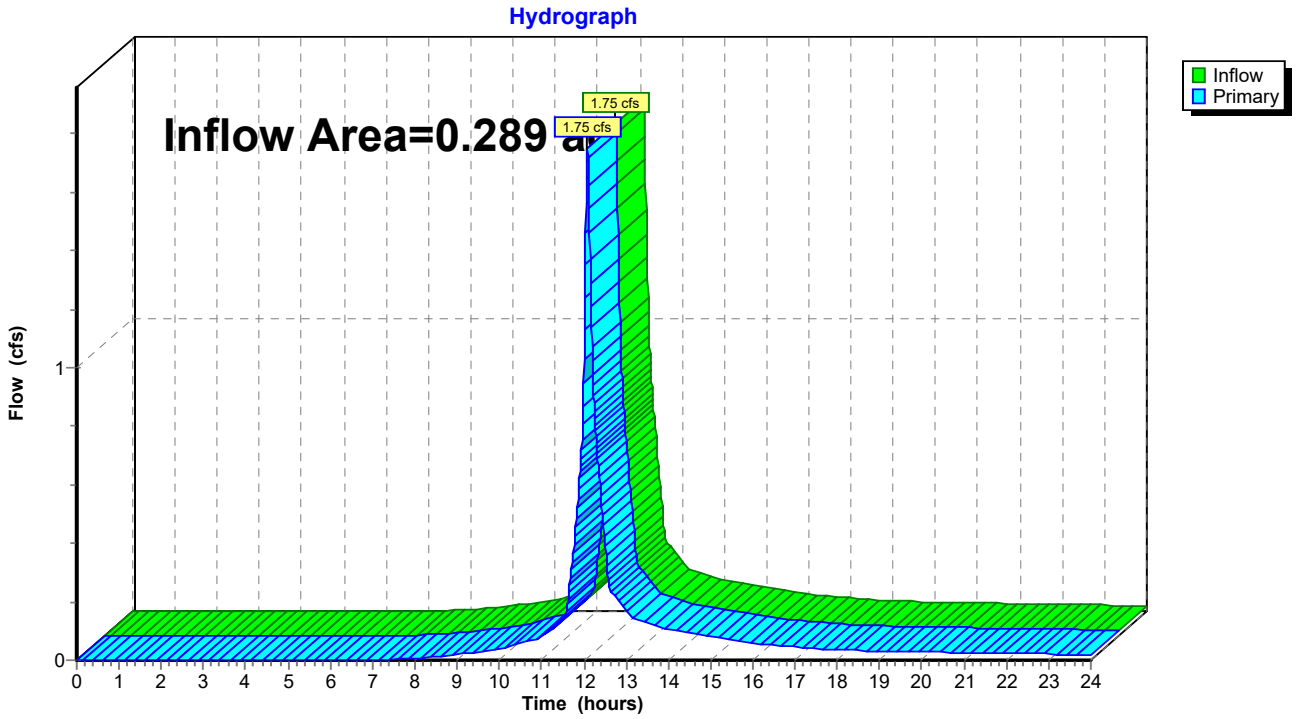


Summary for Link DP3: FLOODPLAIN OVERFLOW

Inflow Area = 0.289 ac, 0.00% Impervious, Inflow Depth > 5.18" for 100-year event
Inflow = 1.75 cfs @ 12.09 hrs, Volume= 0.125 af
Primary = 1.75 cfs @ 12.09 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link DP3: FLOODPLAIN OVERFLOW



Appendix D:
Stormwater Infiltration and Water Quality Calculations

Table 1 Required Recharge Volume
City of Boston
As shown in Vol 3. Chapter 1 Page 15 of the Massachusetts Stormwater Handbook
Required Recharge Volume determined by the following equation:

$R_v = F \times A_{imp}$ where:

R_v	Required Recharge Volume
F	Target Depth Factor
A_{imp}	Impervious Area

Given:
NRCS Hydrologic Soil Type - UNK
Target Depth Factor = 1.25 inch

Subcatchment	A_{imp} $ft.^2$	A_{imp} acre	F inch	R_v acre-ft	R_v $ft.^3$
P1	524	0.01	1.25	0.001	55
P2	3,696	0.08	1.25	0.009	385
P3	726	0.02	1.25	0.002	76
P4	17,366	0.40	1.25	0.042	1809
P5	13,476	0.31	1.25	0.032	1404
P6	46,576	1.07	1.25	0.111	4852
P7	-	0.00	1.25	0.000	0
P8	-	0.00	1.25	0.000	0
P9	33,650	0.77	1.25	0.080	3505
P10	8,189	0.19	1.25	0.020	853
P11	-	0.00	1.25	0.000	0

Table 2 Simple Dynamic Method for Recharge

As shown in Vol 3. Chapter 1 Page 19 of the Massachusetts Stormwater Handbook
Using the following equations

$A = R_v / (D+KT)$

$V = A \times D$

where

R_v	Required Recharge Volume
A	Minimum Req'd surface area of the bottom of the infiltration structure
V	Storage Volume
D	depth of the infiltration facility
K	Rawls rate for saturated hydraulic conductivity
T	allowable drawdown

Use

k for TP1=	1.08	in/hr	per Geotech Report
k for TP2=	1.08	in/hr	per Geotech Report
T	2	hours	

Subcatchment	R_v $ft.^3$	nD ft	A $ft.^2$	$V_{Required}$ $ft.^3$	Receiving Recharge Facility	$V_{provided}$ $ft.^3$	$V_{provided} > V_{req}$ Yes/No
P1	54.58	2.79	18.38	51.28	Underground Infiltration System	1,011	Yes
P2	385.00	3.00	121.07	363.21	Underground Infiltration System	6,870	Yes
P3	75.63	3.00	23.78	71.34	Underground Infiltration System	6,559	Yes
P4	1,808.96	3.00	568.85	1,706.56	Underground Infiltration System	6,870	Yes
P5	1,403.75	3.50	381.45	1,335.09	Underground Infiltration System	6,651	Yes
P6	4,851.67	3.00	1,525.68	4,577.04	Underground Infiltration System	6,559	Yes
P7	0.00	0.00	0.00	0.00	-	-	-
P8	0.00	0.00	0.00	0.00	-	-	-
P9	3,505.21	3.50	952.50	3,333.76	Underground Infiltration System	12,820	Yes
P10	853.02	3.50	231.80	811.30	Underground Infiltration System	12,820	Yes
P11	0.00	0.00	0.00	0.00	-		-

Table 3 Drawdown

Using the following equations

$Time_{drawdown} = R_v/(K^* Bottom\ Area)$

As shown in Vol 3. Chapter 1 Page 25 of the Massachusetts Stormwater Handbook

$Time_{drawdown}$	Drawdown time for Infiltration BMP, must be < 72 hours
R_v	Required Recharge Volume
Bottom area	Bottom Area of Recharge Structure
K	Rawls rate for saturated hydraulic conductivity

k for TP1=	1.08	in/hr	per geotech report
k for TP2=	1.08	in/hr	per geotech report

Subcatchment	R_v $ft.^3$	Bottom Area $ft.^2$	$Time_{drawdown}$ hours	$Time_{drawdown}$ < 72 hours Yes/No
P1	54.58	755	0.80	Yes
P2	385.00	3204	1.34	Yes
P3	75.63	3060	0.27	Yes
P4	1,808.96	3204	6.27	Yes
P5	1,403.75	2548	6.12	Yes
P6	4,851.67	3060	17.62	Yes
P7	0.00	-	-	-
P8	0.00	-	-	-
P9	3,505.21	4788	8.13	Yes
P10	853.02	4788	1.98	Yes
P11	0.00	-	-	-

Table 4 Water Quality Volume

As shown in Vol 3. Chapter 1 Page 32 of the Massachusetts Stormwater Handbook

$V_{WQ} = (D_{WQ}/12 \text{ in/ft})*(A_{imp}*43{,}560 \text{ ft.}^2/\text{acre})$

where

V_{WQ}	Water Quality Volume
D_{WQ}	Water Quality Depth
A_{imp}	Impervious Area

D_{WQ} 1.25 in

Subcatchment	A_{imp}	A_{imp}	V_{WQ}	$V_{provided}$*	$V_{provided} > V_{req}$
	ft.^{2}	acre	ft.^{3}	ft.^{3}	Yes/No
P1	524	0.01	54.58	1,011	Yes
P2	3,696	0.08	385.00	6,870	Yes
P3	726	0.02	75.63	6,559	Yes
P4	17,366	0.40	1,808.96	6,870	Yes
P5	13,476	0.31	1,403.75	6,651	Yes
P6	46,576	1.07	4,851.67	6,559	Yes
P7	0	0.00	0.00	-	-
P8	0	0.00	0.00	-	-
P9	33,650	0.77	3,505.21	12,820	Yes
P10	8,189	0.19	853.02	12,820	Yes
P11	0	0.00	0.00	-	-

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Boston

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Subsurface Infiltration Structure	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**

Total TSS Removal = **85%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **VFW Parkway Apartments**
Prepared By: **JEC**
Date: **3/5/2019**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

Project: VFW Parkway Apartments
Location: Boston, MA
Prepared For: Howard Stein Hudson

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 1 or Table in Figure 2. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

$$Q = (qu)\ (A)\ (WQV)$$

where:

Q = flow rate associated with first 1" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
WQU 1	0.52	0.0008193	5.0	0.083	1.00	795.00	0.65
WQU 2	0.31	0.0004842	5.0	0.083	1.00	795.00	0.38

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

VFW PARKWAY APARTMENTS
BOSTON, MA

Area	**0.52 ac**	Unit Site Designation	**WQU 1**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**5 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.02	0.02	9.3
0.06	9.4%	29.3%	0.03	0.03	9.0
0.08	7.7%	37.0%	0.04	0.04	7.3
0.10	8.6%	45.6%	0.05	0.05	8.1
0.12	6.3%	51.9%	0.06	0.06	5.9
0.14	4.7%	56.5%	0.07	0.07	4.3
0.16	4.6%	61.2%	0.08	0.08	4.3
0.18	3.5%	64.7%	0.08	0.08	3.2
0.20	4.3%	69.1%	0.09	0.09	3.9
0.25	8.0%	77.1%	0.12	0.12	7.1
0.30	5.6%	82.7%	0.14	0.14	4.9
0.35	4.4%	87.0%	0.17	0.17	3.8
0.40	2.5%	89.5%	0.19	0.19	2.1
0.45	2.5%	92.1%	0.21	0.21	2.1
0.50	1.4%	93.5%	0.24	0.24	1.1
0.75	5.0%	98.5%	0.35	0.35	3.7
1.00	1.0%	99.5%	0.47	0.47	0.7
1.50	0.0%	99.5%	0.71	0.71	0.0
2.00	0.0%	99.5%	0.94	0.94	0.0
3.00	0.5%	100.0%	1.42	1.00	0.1
					90.7
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.4%
				Predicted Net Annual Load Removal Efficiency =	**84.2%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD

VFW PARKWAY APARTMENTS
BOSTON, MA

Area	**0.31 ac**	Unit Site Designation	**WQU 2**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**5 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.01	0.01	9.3
0.06	9.4%	29.3%	0.02	0.02	9.1
0.08	7.7%	37.0%	0.02	0.02	7.4
0.10	8.6%	45.6%	0.03	0.03	8.2
0.12	6.3%	51.9%	0.03	0.03	6.0
0.14	4.7%	56.5%	0.04	0.04	4.4
0.16	4.6%	61.2%	0.04	0.04	4.4
0.18	3.5%	64.7%	0.05	0.05	3.3
0.20	4.3%	69.1%	0.06	0.06	4.1
0.25	8.0%	77.1%	0.07	0.07	7.4
0.30	5.6%	82.7%	0.08	0.08	5.1
0.35	4.4%	87.0%	0.10	0.10	4.0
0.40	2.5%	89.5%	0.11	0.11	2.3
0.45	2.5%	92.1%	0.13	0.13	2.2
0.50	1.4%	93.5%	0.14	0.14	1.2
0.75	5.0%	98.5%	0.21	0.21	4.2
1.00	1.0%	99.5%	0.28	0.28	0.8
1.50	0.0%	99.5%	0.42	0.42	0.0
2.00	0.0%	99.5%	0.56	0.56	0.0
3.00	0.5%	100.0%	0.84	0.84	0.2
					93.3
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**86.9%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Appendix E:
Operation and Maintenance Plan

Parkway Apartments
Stormwater Management System

Operation and Maintenance Plan (O&M)
and
Long Term Pollution Prevention Plan (LTPPP)

March 2019

This Stormwater Management System Operation and Maintenance Plan provides for the inspection and maintenance of structural Best Management Practices (BMPs) and for measures to prevent pollution associated with the Parkway Apartments in Boston, MA.

This document has been prepared in accordance with the requirements of the Stormwater Regulations included in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10).

Responsible Party

Lincoln Parkway LLC c/o Lincoln Property Company will be responsible for the operation and maintenance of the stormwater management facilities and associated stormwater management features.

Contact Information:
Lincoln Parkway LLC c/o Lincoln Property Company
221 Crescent Street, Suite 102A
Waltham, MA 02453
Phone: (781) 398-2223

The stormwater management system will be maintained properly to assure its continued performance, as follows.

1. Catch basins
   a. Inspect quarterly (January, April, July, October)
   b. Clean 2 times per year or when deposits reach ½ the depth of the sump

2. Subsurface Infiltration Systems
   a. Inspect every 6 months and after every major storm event, remove debris
   b. Remove any debris that may clog system.
   c. Remove sediment if depth reaches 3 inches.

3. Water Quality Units
   Follow manufacturer's recommendations including at a minimum:
   a. Inspect twice a year (spring and fall) minimum and after major storm events

b. Sediment removal is required when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated.
c. Remove floatable trash, debris and oil.

4. Grassed swales
   a. Inspect every 6 months
   b. Remove floatable trash, debris and oil.
   c. Clean 2 times per year, removing and replacing dead vegetation, weeds etc.

Maintenance of these components will be conducted in accordance with the Mass DEP Stormwater Policy Manual as noted in the attached Operation and Maintenance table summarizing the pertinent inspection and maintenance activities. The Mass DEP Stormwater Policy Manual is available at the following web-site:

http://www.mass.gov/eea/agencies/massdep/water/regulations/massachusetts-stormwater-handbook.html

If inspection indicates the need for major repairs of structural surfaces, the inspector should contact the Town of Southborough DPW Director to initiate procedures to effect repairs.

Practices for Long Term Pollution Prevention

Litter Pick-up
The Owner will conduct litter pick-up from the stormwater management facilities in conjunction with routine maintenance activities.

Routine Inspection and Maintenance of Stormwater BMPs
The Owner will conduct inspection and maintenance of the stormwater management practices in accordance with the guidelines discussed above.

Maintenance of Landscaped Areas
The Owner shall minimize use of fertilizers, herbicides, and pesticides for the maintenance of facilities covered by this plan.

Prohibition of Illicit Discharges

The DEP Stormwater Management Standards prohibit illicit discharges to the storm water management system. Illicit discharges are discharges that do not entirely consist of stormwater, except for certain specified non-stormwater discharges.

Discharges from the following activities are not considered illicit discharges:

- firefighting
- water line flushing
- landscape irrigation
- uncontaminated groundwater
- potable water sources
- water used to clean residential buildings without detergents
- foundation drains
- footing drains
- individual resident car washing
- flows from riparian habitats and wetlands
- dechlorinated water from swimming pools
- water used for street washing
- air conditioning condensation

There are no known or proposed illicit connections associated with this project.

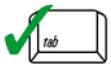
Appendix F:
Checklist for Stormwater Report

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.

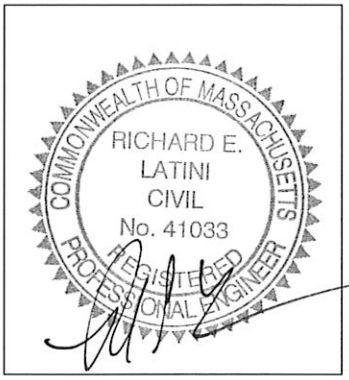
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



3/18/19
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): Suburface Infiltration Systems

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.

Appendix G:
Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement

Project Name: VFW Parkway Apartments, 1545-1555 VFW Parkway, West Roxbury, MA

By signing this statement, I confirm that no illicit discharges (as defined in Section 40 CFR 122.34(b)(3) of the Phase II Stormwater Regulations under the Clean Water Act) are proposed to enter the stormwater system at 1545-1555 VFW Parkway. Illicit discharge detection and elimination procedures will be implemented routinely by visual inspections to prevent illicit discharges into the stormwater system. All personnel working at 1545-1555 VFW Parkway will be informed of the illicit discharge detection and elimination procedures and that no illicit discharges are allowed to enter the stormwater system.

Signature: J. C. Moore

Title: as Vice President

Date: 4-15-19

Company: Lincoln Parkway LLC c/o Lincoln Company 221 Crescent St, Suite 102A WALTHAM, MA 02453

Address: 1545-1555 VFW Parkway, West Roxbury, MA 02132

Telephone Number: 781-398-2223

Appendix H:
Proposed Plans (under Separate Cover)