



CITY OF WATERTOWN

Conservation Commission

Remote Meeting with Participation on Zoom

Leo G. Martin, Chair
Maria P. Rose, Vice Chair
Charles Bering, Member
Jamie O'Connell, Member
Darya Mattes, Member
Rachel Danford, Member

The Conservation Commission for the City of Watertown will hold a remote public meeting on April 12, 2023 at 7:00 PM. This meeting has only remote opportunities for participation with public access provided as follows:

CONSERVATION COMMISSION MEETING WEDNESDAY, APRIL 12, 2023 AT 7:00 PM REMOTE MEETING WITH PARTICIPATION ON ZOOM AGENDA

ACCESS INFORMATION:

- A. The meeting will be televised through WCATV (Watertown Cable Access Television): <http://vodwcatv.org/CablecastPublicSite/?channel=1>
- B. The Public may join the virtual meeting online: <https://watertown-ma.zoom.us/j/99597080710>
- C. Public may join the virtual meeting audio only by phone: (877) 853-5257 or (888) 475-4499 (Toll Free) and enter Webinar ID: 995 9708 0710
- D. Public may comment through email: sjenness@watertown-ma.gov

-
1. Informational Update
 - A. Arsenal Park- Phase B
 2. Public Hearing-
 - A. **Request for Extension of Order of Conditions-** Mass DEP- 321-0165- 485-617 Arsenal St- within the 200-foot Riverfront Area and Watertown 150-foot Buffer Zone to the Charles River including, installation of subsurface storm water management structures, construction of a multi-use pathway and regrading/repaving of specific areas. Boylston Properties, BP Watertown Retail, LLC, Applicant/ Andrew Copelotti, Representative
 3. Public Hearing-
 - A. (Continuance was requested to April 12, 2023 meeting)- **Notice of Intent- O Arlington St. (Williams Pond Parcel)-** Mass DEP 321-0174- to construct a 2 story commercial building

- and parking lot on property known as the Williams Pond parcel: Max Hatziliades, Applicant/Owner, Mickey Marcus, Representative
4. Public Hearing-
 - A. Continuance was requested to the May 3, 2023 meeting)- **Request for Determination of Applicability-** for the proposed parking lot improvements and utility upgrades located at **10-30 Manley Way, Watertown, Massachusetts**. PPF Industrial 20 Seylon, LLC, Owner, Christopher M. Lucas, Representative/Applicant
 5. Public Hearing-
 - A. (Continued from the March 1, 2023 meeting)- **Lot located off 0 Arlington St- Notice of Intent- Mass DEP 321-0186-** submitted for the construction of a 41,289 square feet (sf) of pervious parking area to grade and pave the north side of Sawins Pond, extending from the existing paved parking lot, located off 0 Arlington Street, between 71 Arlington Street and 15 Arlington Street taking place within the 100 foot Buffer Zone of Vegetated wetlands and Inland Bank and locally regulated 150 foot Buffer Zone. Polina Safran, Representative from SWCA, Max Hatziliades, Owner
 6. Acceptance of Minutes
 - A. Review and acceptance of Minutes from the February 1, 2023 meeting
Review and acceptance of Minutes from the March 1, 2023 meeting.
 7. Agent Report
 - A. CPC Update- Jamie O'Connel
GSA Site Update
99 Coolidge Ave. Update
64 Pleasant St. Update

Arsenal Park Phase B

City of Watertown, Massachusetts

April 2023

**CDM
Smith®**



Project Status

- January 2022 – Special remote Conservation Commission meeting to review 90% Arsenal Park Phase B Drawings.
- Conservation Commission requested CDM Smith evaluate adding a new spray park to the project in lieu of repairs to the existing spray park.
- April 2022 – CDM Smith presented the Arsenal Park 90% design to City Council.
- City Council approved pre-purchase of the playground play equipment.
- City Council directed CDM Smith to include a new spray park in the final design documents.
- April 12, 2023 – CDM Smith informational presentation to Conservation Commission.
- Conservation Commission comments from the 90% review have been incorporated into the final bid documents.
- New Spray Park has been incorporated into the final bid documents.
- Next Steps



- Realigned entry drive
- Brick entry columns
- Resurfaced parking lot
 - ADA improvements
 - Vehicle drop off area
 - New lighting
- New entry plaza
 - New entry sign
 - Reduced hardscape
- New inclusive all-ages playground
- New picnic/grill area
- Re-paved loop path
- New north-south shared use path
- New backstop
- New promenade
- (2) basketball courts
- (3) tennis courts
- (6) pickleball courts
- New court lighting
- New picnic shelter and seating area
- New skate park
- Community garden
- Native plantings and green stormwater practices throughout



Park Entry Parking Lot

Park Entry / Parking Lot



- Brick pillars at entry
- Realigned entry drive
- Shared-use path connection to Arsenal Yards development
- Full-depth pavement repair
- Improved ADA parking and access
- New parking lot lighting

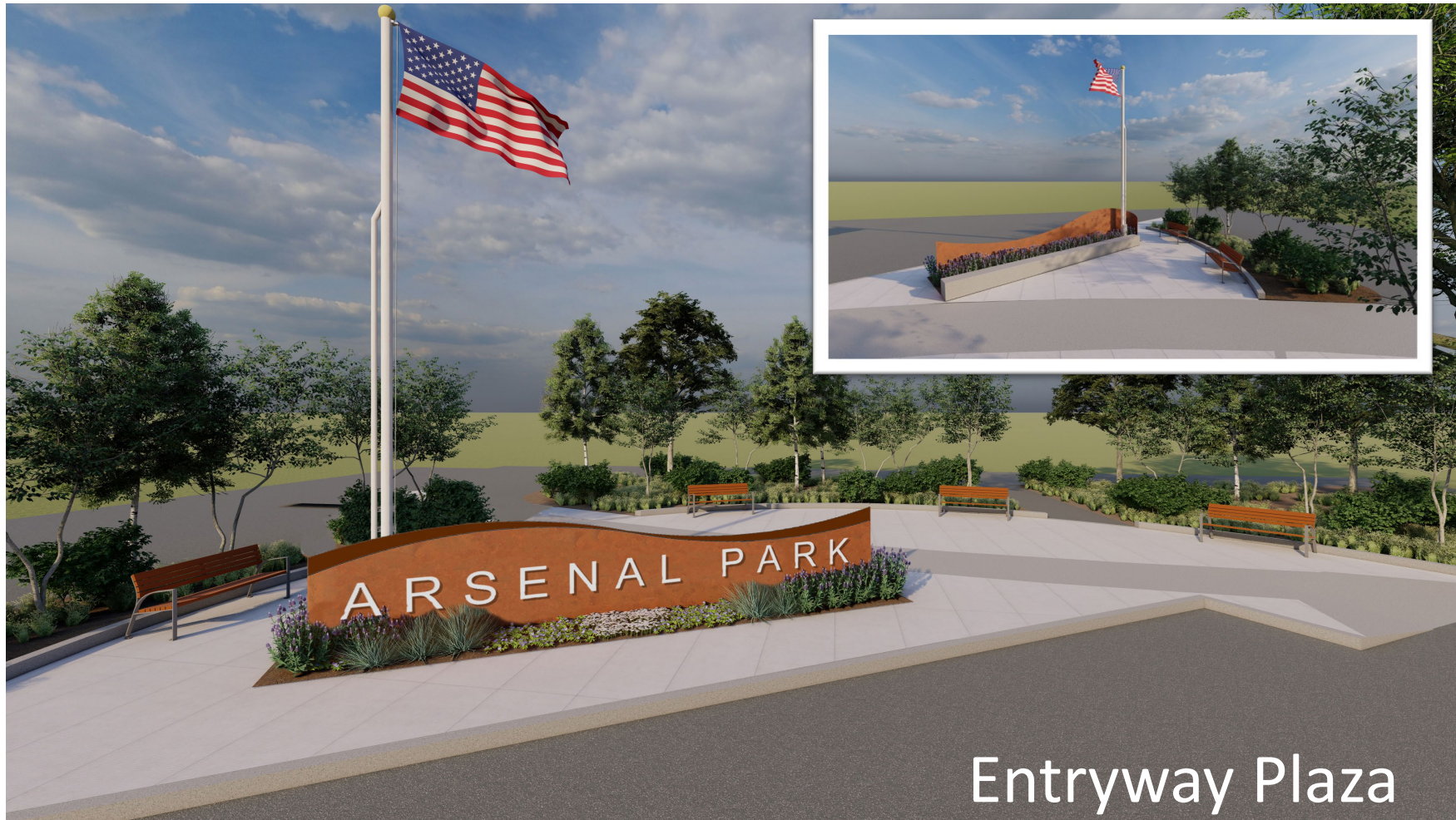


Entryway Plaza

Entryway Plaza



- Drop-off area
- Open plaza space available for check-in tables, etc. during events
- Heavily planted beds and shade trees
- Arsenal Park entryway sign



Entryway Plaza

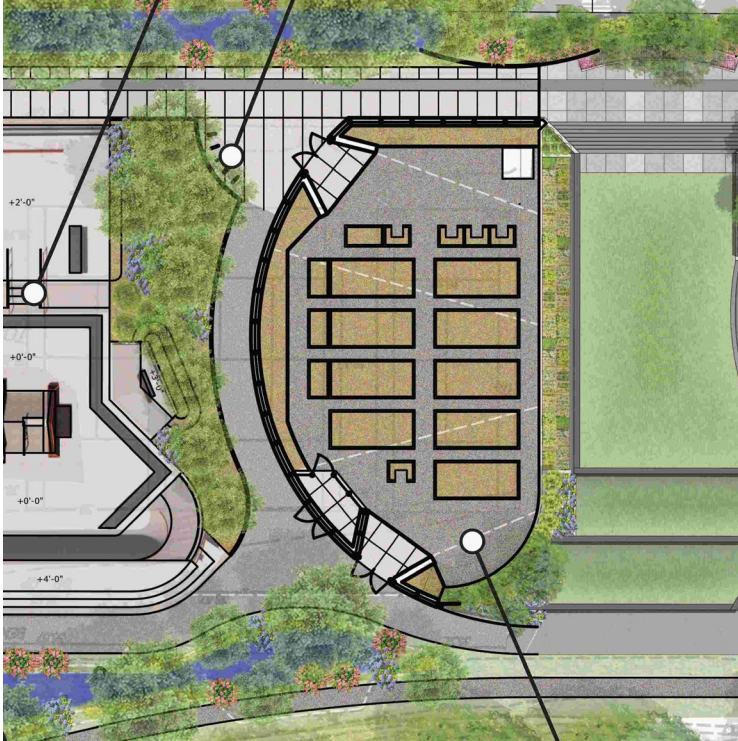


Community Garden

Community Garden – Fresh Pond

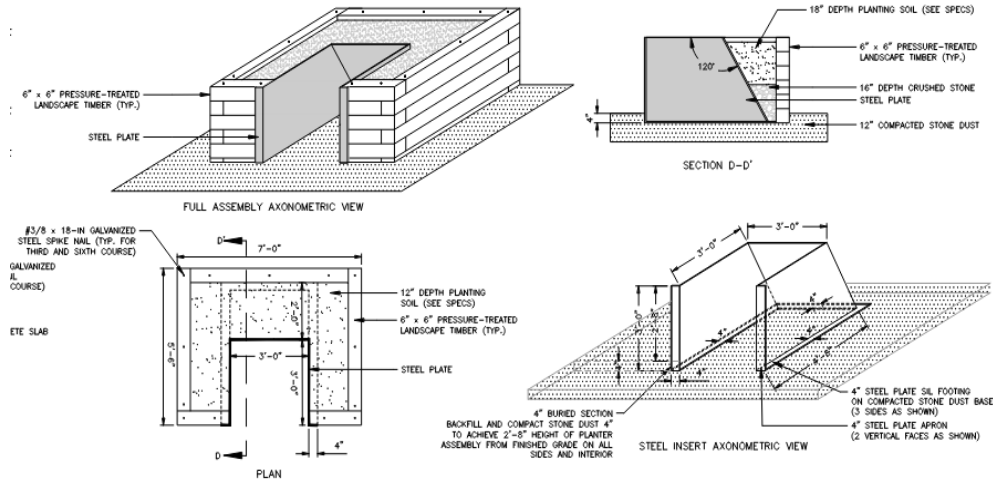


Community Garden



- Incorporated desired layout from Community Garden Board
- (36) 4x10 12" tall beds
- (4) 32" tall standing beds
- (5) accessible 32" tall 'pods'
- Perimeter pollinator/children's beds

Community Garden



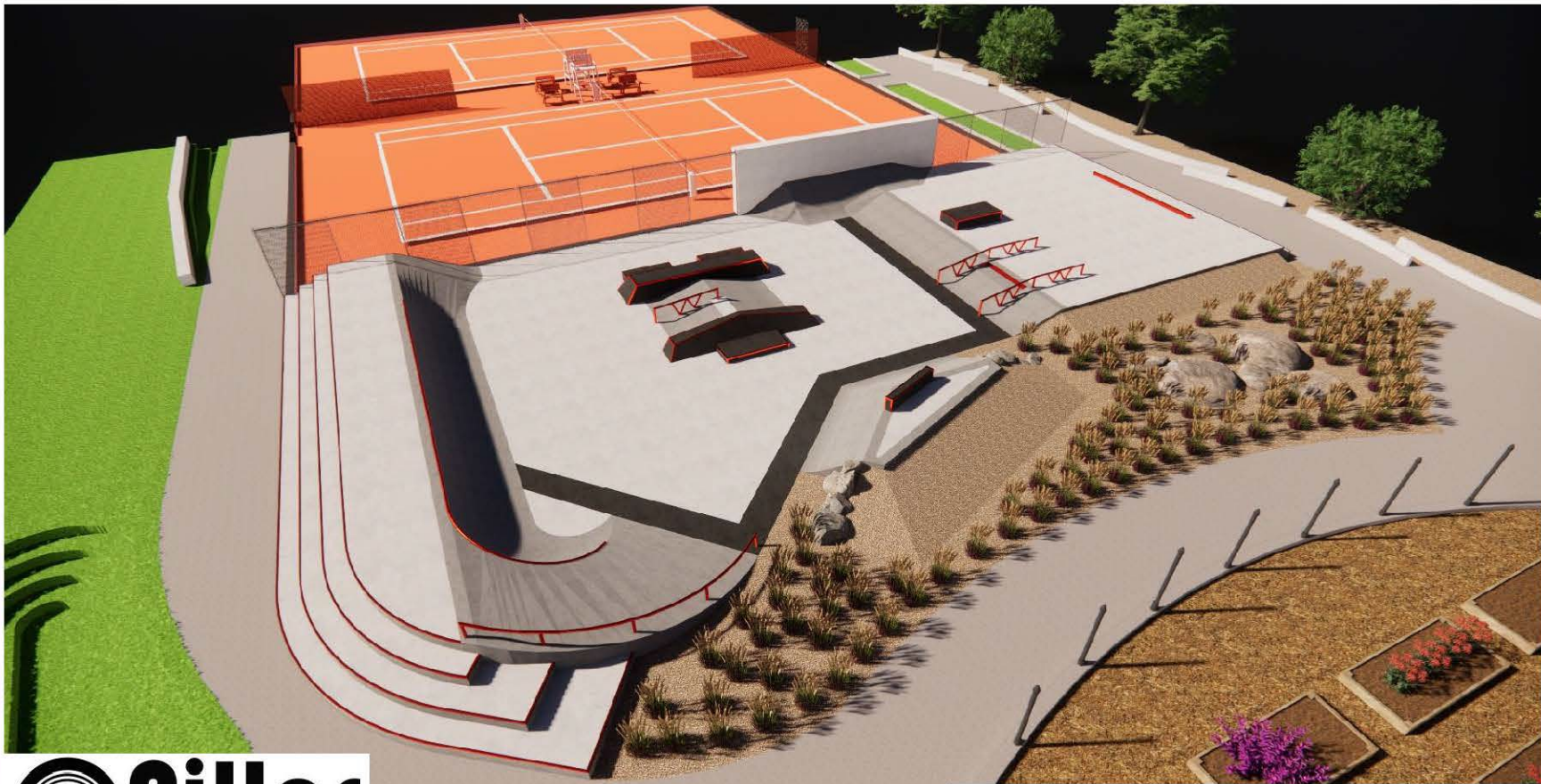
FABRICATED STEEL AND TIMBER ADA ACCESSIBLE PLANTER PODS

DETAIL 2
D-9
NOT TO SCALE





Skate Park





Courts Area

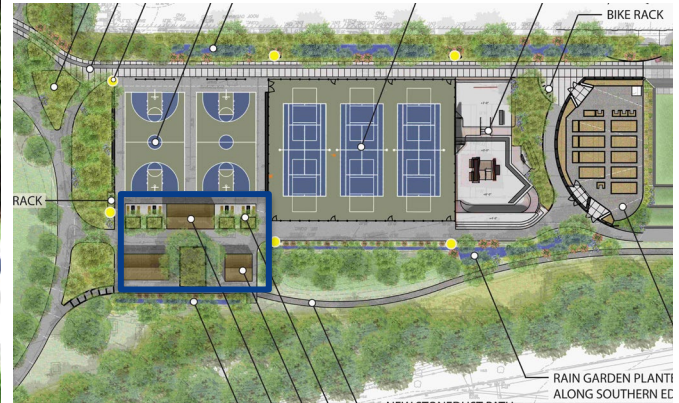
Courts Area



- New 42-ft length ball wall
- (3) tennis courts with netting
- (6) stripped pickleball courts
- (2) basketball courts
- Seat wall - basketball court perimeter
- New court lighting system



Court Shade Structure







Perimeter Path Improvements

Perimeter Path Improvements



- Resurfaced 8-ft wide perimeter loop path
- New backstop
- Underground stormwater infiltration system
- Rain garden in southwest corner of field



Amphitheater Area

Amphitheater Area



- Protecting existing amphitheater structure with select plantings in between risers
- Erosion repair/restoration plantings/seeding in woodland area
- Erosion control measures to prevent future scouring



Picnic Area

Picnic Area



- Remove existing spray pad with plan to design new spray park in near future
- Relocate all existing grills and picnic tables from playground area to create new consolidated picnicking area



Planting Plan

Planting Statistics

- Reduced impervious area by approx. 9,500 SF
- Added 10,500 SF of rain gardens for stormwater control
- 100% native planting palette
- >180 new trees
- >800 new shrubs
- >1,000 new grasses and perennials
- >53,000 square feet of new seeded area



Species

Trees

<i>Acer rubrum</i>	Red Maple
<i>Amelanchier arborea</i>	Serviceberry
<i>Betula nigra</i>	River Birch
<i>Betula papyrifera</i>	Paper Birch
<i>Cornus florida</i>	Flowering Dogwood
<i>Hamamelis virginiana</i>	Witchhazel
<i>Picea pungens</i>	Blue Spruce
<i>Sassafras albidum</i>	Sassafras

Shrubs

<i>Arctostaphylos uva-ursi</i>	Bearberry
<i>Aronia melanocarpa</i>	Chokecherry
<i>Ceanothus americanus</i>	New Jersey tea
<i>Comptonia peregrina</i>	Sweetfern
<i>Fothergilla gardenii</i>	Dwarf Fothergilla
<i>Hamamelis virginiana</i>	Witchhazel
<i>Kalmia latifolia</i>	Mountain Laurel
<i>Myrica pensylvanica</i>	Northern Bayberry
<i>Rhus aromatica</i>	Fragrant Sumac
<i>Vaccinium angustifolium</i>	Lowbush Blueberry
<i>Viburnum acerifolium</i>	Maple-leaf Viburnum

Perennials and Grasses

<i>Eurybia divaricata</i>	White wood aster
<i>Eurybia macrophylla</i>	Big-leaved aster
<i>Lobelia cardinalis</i>	Cardinal flower
<i>Solidago nemoralis</i>	Old field goldenrod
<i>Symphotrichum cordifolium</i>	Heart-leaved aster
<i>Carex pensylvanica</i>	Sedge
<i>Carex vulpinoidea</i>	Fox sedge
<i>Deschampsia cespitosa</i>	Tufted hair grass
<i>Schizachyrium scoparium</i>	Little bluestem

Sunny Meadow Mix



Shade Meadow Mix



SEDGE



WILD GERANIUM



BLUE RIDGE SEDGE



CARDINAL FLOWER



TUFTED HAIR GRASS



FOAM FLOWER



BLUE WOOD ASTER



TUFTED HAIR GRASS



COLUMBINE

Rain Garden Mix



LITTLE BLUESTEM



LANCE-LEAFED TICKSEED



VIRGINIA WILD RYE



CARDINAL FLOWER



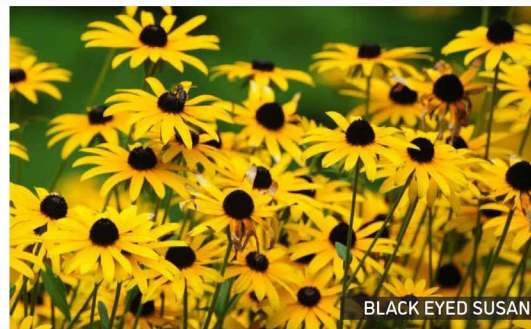
FOX SEDGE



BUTTERFLY WEED



NEW ENGLAND ASTER



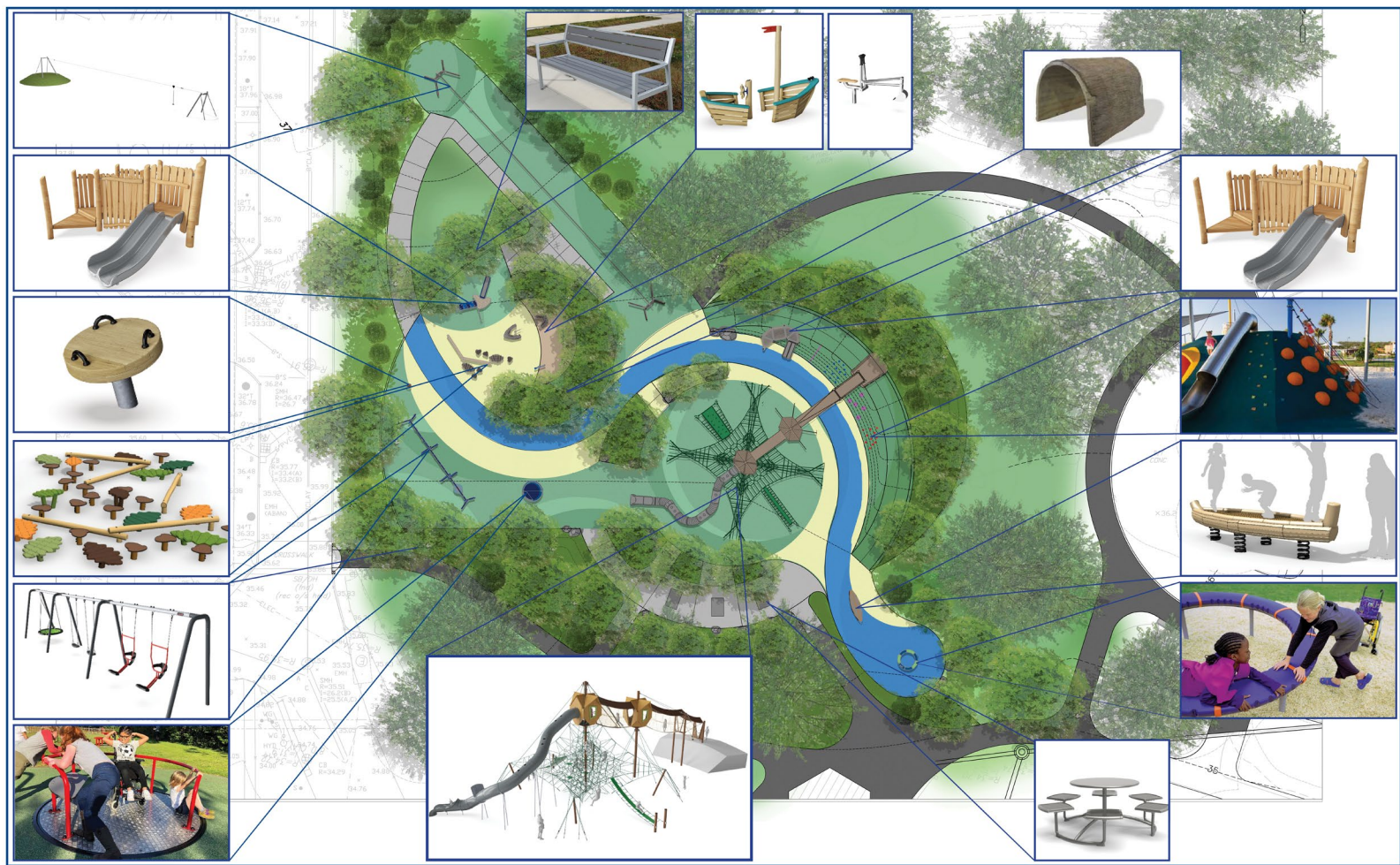
BLACK EYED SUSAN



NEW ENGLAND ASTER



Playground



Playground Layout

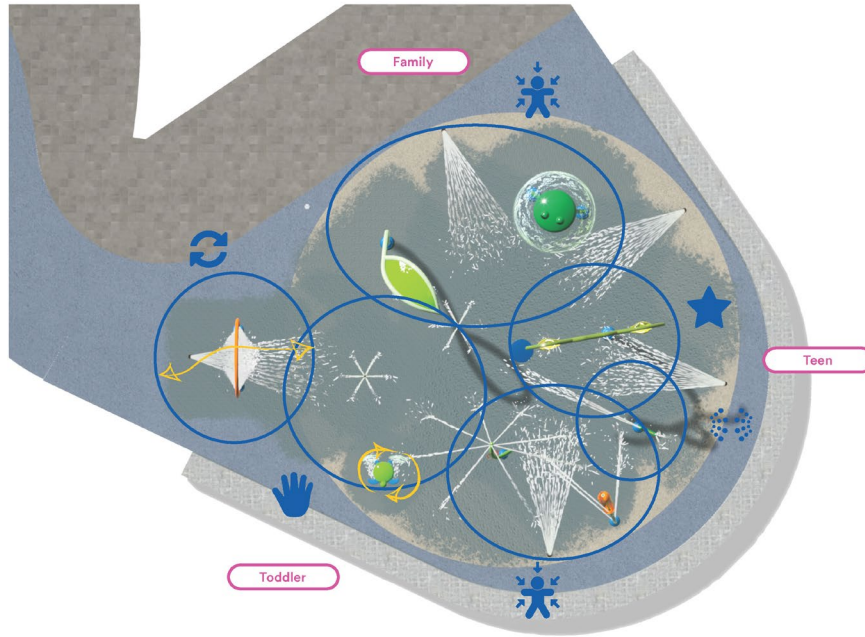


- Charles River theme
- Focus on flow of play
- Focus on inclusivity and accessible play opportunities
- Improved sight lines for parents and caregivers
- Increased planted areas and rain gardens





Playground Splash Pad



- Improved flow of play
- Improved sight lines for parents and caregivers
- Reduced impervious materials
- Improved accessible play opportunities
- Increased planted areas and rain gardens

Playground Splash Pad





BOYLSTON
PROPERTIES

February 16, 2023

Ms. Susan Jenness
Clerk, Watertown Conservation Commission
149 Main Street, 3rd Floor
Watertown, MA 02472

Regarding: Extension Request to Order of Conditions\Mass DEP File #321-0165
Arsenal Yards, Watertown, MA

Dear Ms. Jenness,

Please note that the current Order of Conditions for our Arsenal Yards project (Mass DEP File #321-0165) was extended in March 2020 and is now set to expire on June 20, 2023. As the Commission knows, the approved project is phased, and the last phase (500 Forge) is anticipated to be completed in the spring of 2023. As we discussed with Katherine Swan, the conservation commission would prefer that the soon-to-be-installed plantings get established for a minimum of one (1) year. Condition #5 in the Order of Conditions states the following:

The issuing authority may extend this order for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the Order's expiration date.

Boylston Properties respectfully requests a formal extension to the Order of Conditions until June 20, 2026. Based on this extension request, we kindly ask to be added to the Conservation Commission agenda for **April 5, 2023**. Attached to this letter, please find a completed WPA form 7: Extension Permit of Order of Conditions.

If you have any questions or comments, please do not hesitate to call.

Sincerely,
Boylston Properties

Andrew J. Copelotti
Principal

cc: Leo Martin, Chair – Town of Watertown Conservation Commission
Katherine Swan – Town of Watertown
Roy Smith – RJ O'Connell
Justin MacEachern – Boylston Properties
Project file

Attachments (1)



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 7 – Extension Permit for Orders of Conditions

321-0165

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

Provided by DEP

A. General Information

Important:

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



1. Applicant:

Andrew J. Copelotti c/o Boylston Properties

Name

800 Boylston Street, Suite 1390

Mailing Address

Boston

City/Town

MA

State

02199

Zip Code

2. Property Owner (if different):

BP Watertown Retail, LLC c/o Boylston Properties

Name

Same as above

Mailing Address

City/Town

State

Zip Code

B. Authorization

The Order of Conditions (or Extension Permit) issued to the applicant or property owner listed above on:

3/4/2020

Date

Issued by:

Town of Watertown

Conservation Commission

for work at:

485 & 615 Arsenal Street

Street Address

100441-2D

Assessor's Map/Plat Number

1301-2D-2

Parcel/Lot Number

recorded at the Registry of Deeds for:

Middlesex South

County

77583

Book

242

Page

Certificate (if registered land)

is hereby extended until:

June 20, 2026

Date

June 20, 2023

Date the Order was last extended (if applicable)

This date can be no more than 3 years from the expiration date of the Order of Conditions or the latest extension. Only unexpired Orders of Conditions or Extension may be extended.

This Extension Permit must be signed by a majority of the Conservation Commission and a copy sent to the applicant and the appropriate DEP Regional Office (<https://www.mass.gov/service-details/massdep-regional-offices-by-community>).



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 7 – Extension Permit for Orders of Conditions

321-0165

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

Provided by DEP

B. Authorization (cont.)

Issue Date (mm/dd/yyyy)

Signatures:

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 7 – Extension Permit for Orders of Conditions

321-0165

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

Provided by DEP

C. Recording Confirmation

The applicant shall record this document in accordance with General Condition 8 of the Order of Conditions (see below), complete the form attached to this Extension Permit, have it stamped by the Registry of Deeds, and return it to the Conservation Commission.

Note: General Condition 8 of the Order of Conditions requires the applicant, prior to commencement of work, to record the final Order (or in this case, the Extension Permit for the Order of Conditions) in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, it shall be noted in the Registry's Granter Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, it shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done.

Detach this page and submit it to the Conservation Commission prior to the expiration of the Order of Conditions subject to this Extension Permit.

To:

Town of Watertown
Conservation Commission

Please be advised that the Extension Permit to the Order of Conditions for the project at:

485 & 615 Arsenal Street
Project Location

321-0165
DEP File Number

has been recorded at the Registry of Deeds of:

Middlesex South
County

for:

BP Watertown Retail, LLC c/o Boylston Properties
Property Owner

and has been noted in the chain of title of the affected property in accordance with General Condition 8 of the original Order of Conditions on:

4/21/2017
Date

69462
Book

139
Page

If recorded land the instrument number which identifies this transaction is:

Instrument Number

If registered land, the document number which identifies this transaction is:

Document Number

Signature of Applicant

Arsenal Yards

Extension Request to Order of Conditions
Mass DEP File #321-0165

Photographs taken: March 20, 2023

Agenda

- Extending the order of conditions for three years to allow for the completion of the project
- The addition of three concrete footings to receive a sculpture
- Questions

Figure 5B

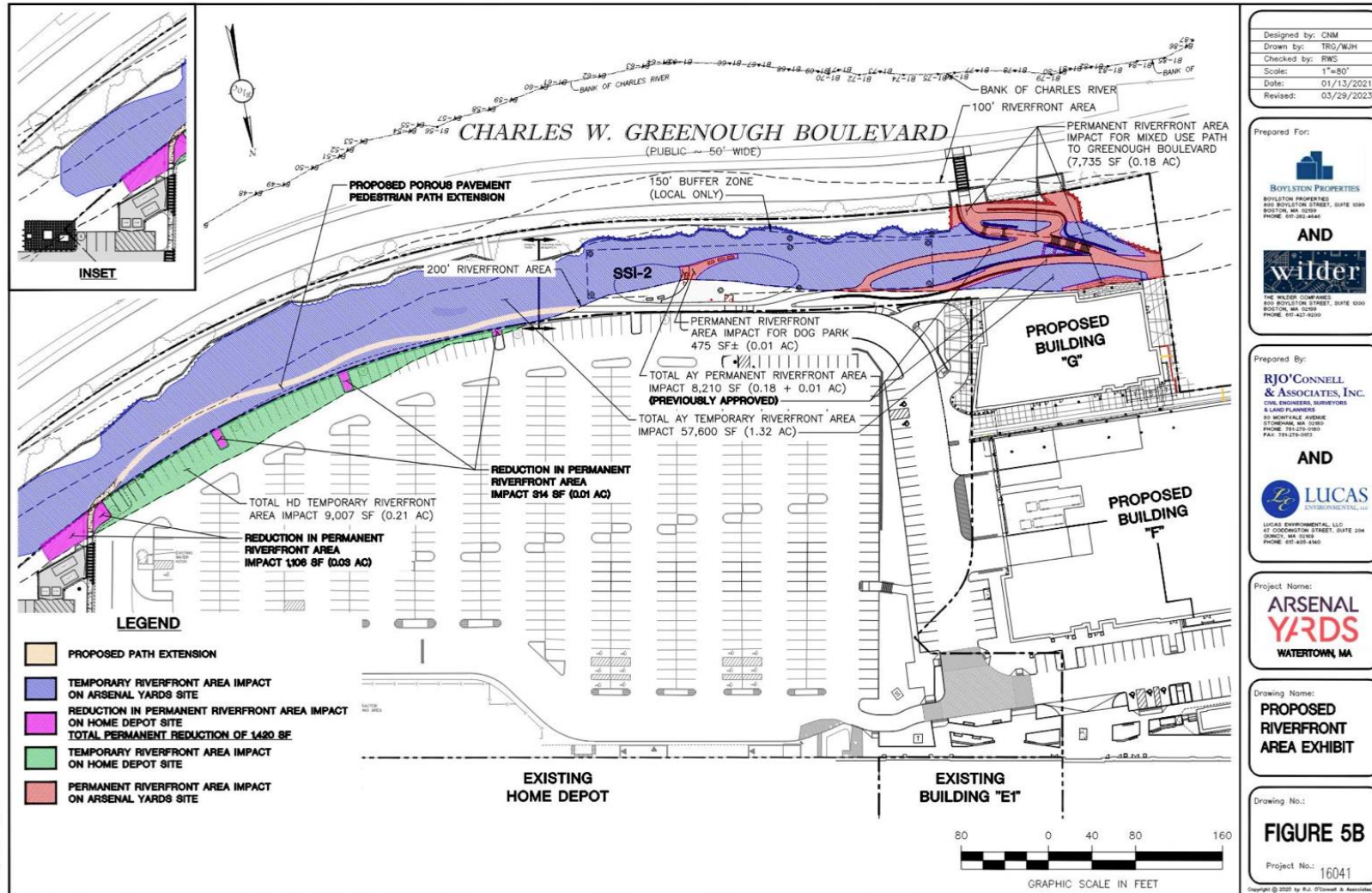
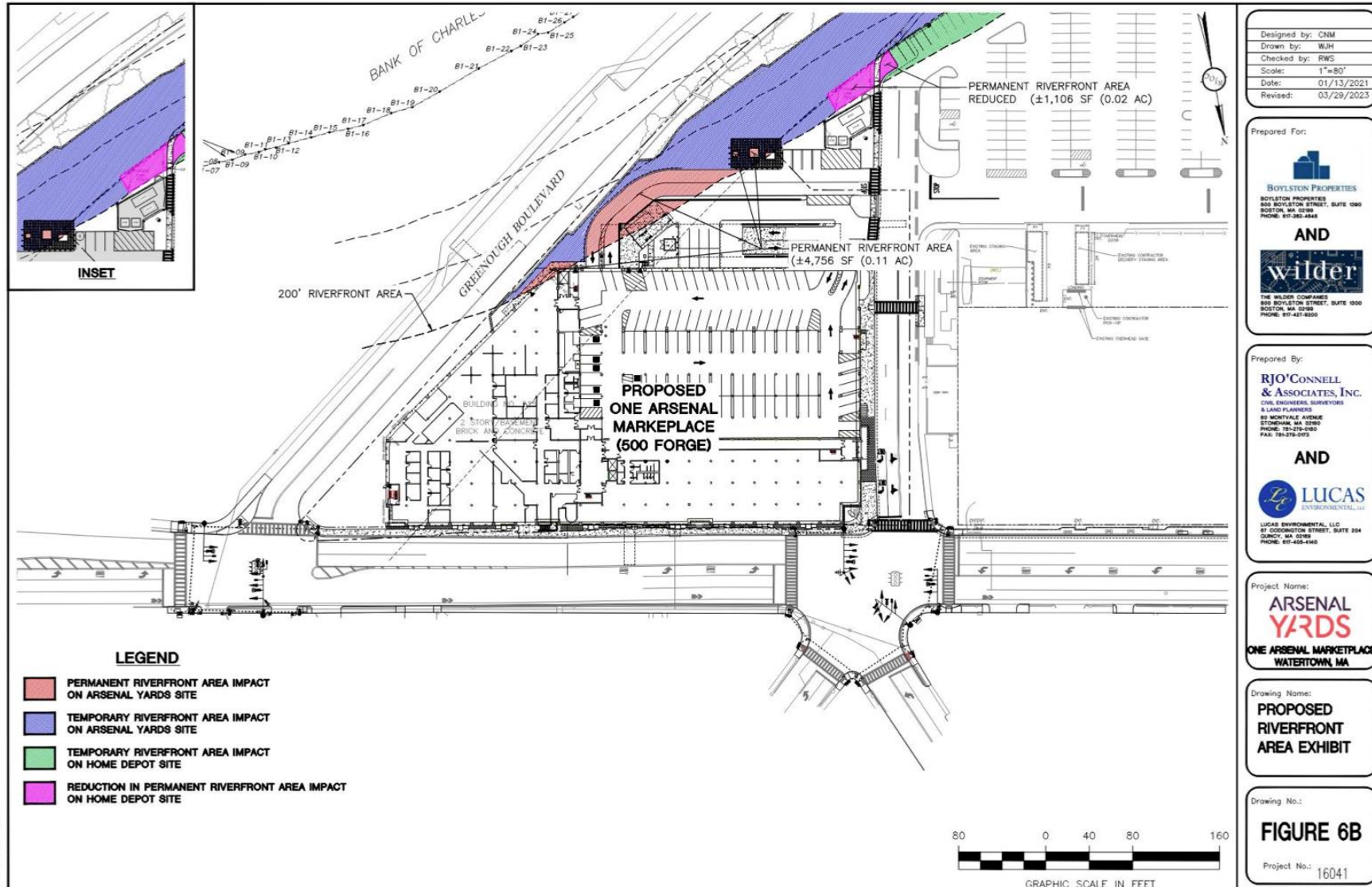


Figure 6B





Path to Arsenal Park looking west



Path to 500 Forge heading east



Exterior deck at 100 Forge



Pedestrian path to Greenough Boulevard



Stairway to Greenough Blvd.



Lower path to 500 Forge heading east



Switchback Ramp to Greenough Blvd.



Retaining wall at Switchback Ramp



Lower path headed towards dog park in background



Path in front of dog park



Dog park entrance



Porous Path headed towards 500 Forge



Landscape planting progress photo



Landscape planting progress photo



Porous Path headed east



Landscape progress photo facing 500 Forge



Porous Path and landscaping



Rear of new Home Depot dumpster enclosure



South side of 500 Forge transformer and switch



Picture of proposed sculpture location



Picture of proposed sculpture footings



ENVIRONMENTAL CONSULTANTS

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1900 West Park Drive, Suite 280
Westborough, Massachusetts 01581
Tel 413.256.0202
www.swca.com

March 29, 2021

Ms. Laurel Schwab, AICP
Senior Environmental Planner & Conservation Agent
Watertown Conservation Commission
149 Main Street
Watertown, Massachusetts 02472

Re: Request for Continuance - Notice of Intent
Parcel 1236-2-0
0 Arlington Street, Watertown, Massachusetts
SWCA Job # 59467

Dear Ms. Schwab and Members of the Conservation Commission:

SWCA Environmental Consultants (SWCA), on behalf of Mr. Maximos Hatziliades (Applicant), has submitted a Notice of Intent (NOI) application for the redevelopment of parcel 1236-2-0 at 0 Arlington Street in Watertown (Williams parcel). The project is scheduled to be discussed on April 7, 2021. However, as the Town will be engaging a third-party consultant to review the project, SWCA is requesting that the hearing be opened on April 7th and continued until the next public hearing date. We appreciate you considering our request to continue the hearing to the next available meeting.

Sincerely,

Valerie Miller
Team Lead, Natural Resources

cc. Maximos Hatziliades



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1900 West Park Drive, Suite 280
Westborough, Massachusetts 01581
Tel 413.256.0202
www.swca.com

March 12, 2021

Ms. Laurel Schwab, AICP
Senior Environmental Planner & Conservation Agent
Watertown Conservation Commission
149 Main Street
Watertown, Massachusetts 02472

Re: Notice of Intent
Parcel 1236-2-0
0 Arlington Street, Watertown, Massachusetts
SWCA Job # 59467

Dear Ms. Schwab and Members of the Conservation Commission:

SWCA Environmental Consultants (SWCA), on behalf of Mr. Maximos Hatziliades (Applicant), has prepared this Notice of Intent (NOI) application for the redevelopment of parcel 1236-2-0 at 0 Arlington Street in Watertown (Williams parcel). The project proposes to redevelop the Williams parcel in accordance with 310 CMR 10.58(5). As part of redeveloping this parcel, the Applicant proposes the construction of a 7,150 square foot mixed-use building accessed from Arlington Street and Elm Street. The Williams parcel is degraded from past abandoned dumping grounds associated with the former property uses when owned by the Hood Rubber Company in the early 1900's and later the B.F Goodrich Company, which utilized the parcel in 1929.

SWCA is submitting four hard copies of this NOI and one full set of civil design plans prepared by Engineering Alliance, Inc. This NOI is also being submitted electronically to the Conservation Commission and the Massachusetts Department of Environmental Protection. The project is proposed as a Category 3.b activity, construction of any commercial development, with a fee of \$1,575.00 that includes the 1.5 multiplier for projects within Riverfront Area. The City's portion of the fee is \$800.00 and is being submitted with this NOI. The Commonwealth's share of \$775.00 is submitted with the eDEP Wetlands Transmittal Fee form. We look forward to presenting this project to the Conservation Commission at the next public hearing. If you have any questions regarding this application or would like to set up a site walk, please do not hesitate to contact us at our office.

Sincerely,

Valerie Miller
Team Lead, Natural Resources

cc. Maximos Hatziliades, Massachusetts Department of Environmental Protection,
Northeast Regional Office



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

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):

0 Arlington Street

a. Street Address

Watertown

b. City/Town

02472

c. Zip Code

Latitude and Longitude:

1236-2-0

f. Assessors Map/Plat Number

42.36415 N

d. Latitude

71.15540 W

e. Longitude

g. Parcel /Lot Number

2. Applicant:

Maximos

a. First Name

Hatzillades

b. Last Name

c. Organization

71 Arlington Street

d. Street Address

Watertown

e. City/Town

MA

f. State

02472

g. Zip Code

(617)331-8209

h. Phone Number

i. Fax Number

maxhatz2@gmail.com

j. Email Address

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

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

Valerie

a. First Name

Miller

b. Last Name

SWCA Environmental Consultants

c. Company

15 Research Drive

d. Street Address

Amherst

e. City/Town

Ma

f. State

01002

g. Zip Code

(413)658-2062

h. Phone Number

i. Fax Number

vmiller@swca.com

j. Email address

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

\$1,575

a. Total Fee Paid

\$775

b. State Fee Paid

\$800

c. City/Town Fee Paid



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

A. General Information (continued)

6. General Project Description:

Redevelopment project to construct a commercial building.

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 CMR 10.24(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:

South Middlesex

a. County

288

c. Book

b. Certificate # (if registered land)

68293

d. Page Number

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

- ☐ 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.
- ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☒ Bordering Vegetated Wetland	4,215 1. square feet	6,930 2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

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

2. Width of Riverfront Area (check one):

- ☐ 25 ft. - Designated Densely Developed Areas only
- ☐ 100 ft. - New agricultural projects only
- ☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 61,711
square feet

4. Proposed alteration of the Riverfront Area:

23,971 22,059 1,912
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.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

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

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

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

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
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
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet	
	2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	
4. ☐ Restoration/Enhancement	If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.	
	a. square feet of BVW	b. square feet of Salt Marsh
5. ☐ Project Involves Stream Crossings		
	a. number of new stream crossings	b. number of replacement stream crossings



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

C. Other Applicable Standards and Requirements

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

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

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

a. ☐ Yes ☒ No

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

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

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 <https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review>).

Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

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

- (c) ☐ MESA filing fee (fee information available at <https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review>).

Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

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

- (d) ☐ Vegetation cover type map of site
- (e) ☐ Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following

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

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

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

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

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

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

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

North Shore - Hull to New Hampshire border:

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

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

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

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

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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

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

Online Users:

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

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
 a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
 b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
 a. ☐ Yes ☒ No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
 a. ☐ Yes ☒ No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
 a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
 1. ☒ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
 2. ☒ A portion of the site constitutes redevelopment
 3. ☒ Proprietary BMPs are included in the Stormwater Management System.
- b. ☐ No. Check why the project is exempt:
 1. ☐ Single-family house
 2. ☐ Emergency road repair
 3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

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

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

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

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

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Watertown

City/Town

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.
- Proposed Site Plan (Sheets C-0, C-1, C-2, C-3, L-1, L-2, D-I, D-II)
- | | | |
|------------------------|--|--------------------------|
| a. Plan Title | Engineering Alliance, Inc. | Richard Salvo |
| b. Prepared By | October 9, 2020 | c. Signed and Stamped by |
| d. Final Revision Date | Wetland Mitigation Plan, SWCA Environmental Consultants (L1-1 and L-2) | 1 inch = 20 feet |
| | | e. Scale |
| | | February 2021 |
| | | 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:

20086

2. Municipal Check Number

20087

4. State Check Number

Scott

6. Payor name on check: First Name

March 9th, 2021

3. Check date

March 9th, 2021

5. Check date

Fisher

7. Payor name on check: Last Name



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



A. Applicant Information

1. Location of Project:

0 ARLINGTON St

a. Street Address

WATERTOWN

b. City/Town

c. Check number

d. Fee amount

2. Applicant Mailing Address:

MAXIMOS

a. First Name

HATZILIADIS

b. Last Name

c. Organization

5 MADISON St

d. Mailing Address

BELMONT

e. City/Town

617-331-8209

h. Phone Number

i. Fax Number

f. State

MA

02478

g. Zip Code

MaxHatz 2 @ Gmail. com

j. Email Address

3. Property Owner (if different):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

B. Fees

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.

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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

F. Signatures and Submittal Requirements

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

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

[Handwritten Signature]

1. Signature of Applicant

3.2.2021

2. Date

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.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

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2. Date

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

6. Date

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



A. Applicant Information

1. Location of Project:

a. Street Address

b. City/Town

c. Check number

d. Fee amount

2. Applicant Mailing Address:

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

3. Property Owner (if different):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

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

B. Fees

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.



Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 3	1	\$1050	1050 X1.5RFA=1,575
Step 5/Total Project Fee:			1,575

Total Project Fee:	<u>\$1,575</u>
	a. Total Fee from Step 5
State share of filing Fee:	<u>\$775</u>
	b. 1/2 Total Fee less \$12.50
City/Town share of filing Fee:	<u>\$800</u>
	c. 1/2 Total Fee plus \$12.50

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.

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.

Page 85 of 434

Notice of Intent Commercial Redevelopment

MARCH 2021

PREPARED FOR
Maximos Hatziliades

PREPARED BY
SWCA Environmental Consultants

NOTICE OF INTENT COMMERCIAL REDEVELOPMENT

Prepared for

Maximos Hatzilliades
71 Arlington Street
Watertown, Massachusetts 02472

Prepared by

SWCA Environmental Consultants
15 Research Drive
Amherst, Massachusetts 01002
(413) 256-0202
www.swca.com

SWCA Project No. 59467

March 2021

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- Appendix C. Filing Fee Checks, Fee Transmittal Form, Abutters List, Abutter Notifications, Affidavit of Mailing
- Appendix D. Draft Release Abatement Measure Plan
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1 INTRODUCTION

On behalf of Maximos Hatziliades (Applicant), SWCA Environmental Consultants (SWCA) has prepared this Notice of Intent (NOI) for redevelopment work and construction of a $\pm 7,150$ square foot (sf) two-story mixed use commercial building on the ± 1.42 -acre Parcel 1236-2-0 located at 0 Arlington Street in Watertown, Massachusetts (Williams parcel). In 2019, SWCA prepared an Abbreviated Notice of Resource Area Delineation (ANRAD) for the Williams parcel and for a second parcel, Parcel 1510-1-0, located to the east, the location of Sawins Pond. The Applicant owns both parcels, but the work proposed in this NOI is only for work proposed on the Williams parcel. The Williams parcel is illustrated on Figure 1 the U.S. Geological Survey (USGS) Topographic Map and Figure 2 the Aerial Map provided in Appendix A. The civil design plan illustrating the proposed project was developed by Engineering Alliance, Inc. (Engineering Alliance) and is presented in Appendix B.

This NOI is being submitted in compliance with the Massachusetts Wetland Protection Act (MGL c.131 §40) (WPA) and its implementing Regulations (310 CMR 10.00 *et seq.*) and the Watertown Wetland Protection Ordinance (Wetland Ordinance) and its Rules and Regulations for the Administration of the Watertown Wetland Ordinance of 2008 (revised 2012). The project proposes to construct the commercial building as part of redeveloping this degraded site and to restore resource areas at the Williams parcel. The project will allow the Applicant to develop a commercial building, restore degraded riverfront areas (RFA) and wetlands, and provide limited clean-up to soil when contaminants are encountered.

The project is being proposed as a redevelopment project to improve this degraded parcel in accordance with 310 CMR 10.58(5). The Williams parcel was formerly owned by the Hood Rubber Company that utilized the parcel in the early 1900's and later the B.F Goodrich Company, which utilized the parcel in 1929 (Vineyard Engineering & Environmental Services, Inc. 2008b). The parcel has also been degraded and impacted by off-site sources that have been documented as occurring in the 1970's (*e.g.*, petroleum oil) and polychlorinated biphenyls (PCBs) in 1983 (Vineyard 2008a). These contaminants were reported to have been discharged to the Williams parcel and the downgradient Sawins Pond parcel through catch basin and off-site sources (Vineyard 2008b). Work at the Williams property will include:

- Restore RFA functions and values associated with the stream present at this parcel.
- Restore the condition and quality of the Bordering Vegetated Wetlands (BVWs) currently impacted by contaminants, invasive species, debris, and trash.
- Provide limited cleanup of contaminants encountered during construction in accordance with a Release Abatement Measure Plan (RAM).
- Improve stormwater quality, and ultimately stream quality, by repairing the headwall and installing a stormwater water quality structure at the existing 24-inch culvert at the west side of the site.

While temporary impacts to resource areas will occur, restoration and redevelopment of this degraded area will improve the aesthetics of the site as well as improve the quality of the jurisdictional resources at the Williams parcel resulting in a net ecological benefit and improve the capacity of the RFA to better protect the interests of the WPA. The proposed work will impact $\pm 4,215$ -sf of BVW, which will be mitigated by constructing $\pm 6,930$ -sf of BVW on the southern portion of the parcel. The WPA Regulations have a 100-foot Buffer Zone to BVW, and the Wetlands Ordinance regulates a 150-foot Buffer Zone to BVW. Because the site is only ± 1.42 acres, the proposed building and mitigation will all be located within these buffer zones. The Wetlands Ordinance also has a 50-foot No Build Zone to BVW, which the Applicant is requesting a waiver from so the building and mitigation areas can be constructed.

A perennial stream, locally referred to as Williams Brook, is also present on the Williams parcel. In accordance with the Regulations and Wetlands Ordinance a 200-foot RFA is associated with this stream that extends upland from the mean annual high-water line (MAHWL). The proposed construction and mitigation will also be located within this 200-foot RFA. There is no buffer zone associated with RFA.

Pursuant to the Regulations and the Watertown Conservation Commission (Commission), four paper copies and an electronic copy of this NOI are being submitted to the Commission, with an electronic copy to the Massachusetts Department of Environmental Protection (MassDEP) using the eDEP filing system. The project is proposed as a Category 3.b activity, construction of any commercial development, with a fee of \$1,575.00, which includes the 1.5 multiplier for projects within RFA. The City's portion of the fee is \$800.00 and is enclosed with this NOI. The Commonwealth's share of \$775.00 is submitted with the eDEP Wetlands Transmittal Fee form. Copies of the checks and transmittal form are provided in Appendix C.

In accordance with the Wetlands Ordinance, SWCA will provide written notification by certified mail to all abutters whose lot is within 300 feet from the site. The notification will state where the NOI can be reviewed. At the time of the filing, SWCA will also notify the Offices of the Town Council, Town Planning Board and Board of Appeals, Board of Health, Building Inspector, Town Manager, and Department of Public Works that the NOI has been submitted. Copies of the NOI will also be provided to these Town Departments and it is understood they have fourteen days to provide written comments to the Watertown Commission. The certified list of abutters, abutter notification, and the affidavit of mailing are included in Appendix C.

2 SITE DESCRIPTION

The Williams parcel is located in a mixed industrial, commercial, and residential area of Watertown and is currently vacant and wooded with $\pm 7,930$ -sf of BVW present in association with a perennial stream, locally referred to as Williams Brook. The parcel is zoned as Regional Mixed Use (RMUD) and not located within any overlay districts. The parcel is ± 1.42 acres and located on the west side of Arlington Street. Elm Street and the Watertown Mall are to the west. Upstream drainage into the stream is entirely derived from roadways, parking lots, a major shopping center (including a Target Superstore), and urban runoff that enters the site by way of a large culvert from under Elm Street. Flow from the stream on the Williams parcel continues under Arlington Street through a series of concrete box culverts, including a double-box concrete bay (2 ± 60 -inch box culverts) and a ± 48 -inch stormwater overflow concrete box culvert. The stream remains underground for ± 110 linear feet under Arlington Street before daylighting on the eastern side of the Street and into Sawins Pond. The entirety of the Williams parcel slopes inward from the surrounding area toward the stream, and elevations range from ± 24 feet at the perimeter down to ± 10 feet at the discharge point and culvert at Arlington Street.

Much of the wooded upland area on the Williams parcel is along the left descending bank of the stream (the right and left bank of a stream is determined while facing downstream) and consists of steeply graded fill. Existing vegetation on the uplands consists of overgrown field, scrub shrub, and mixed tree species including, but not limited to silver maple (*Acer saccharinum*), northern catalpa (*Catalpa speciosa*), box elder (*Acer negundo*), staghorn sumac (*Rhus typhina*), annual mugwort (*Artemisia annua*), annual ragweed (*Ambrosia artemisiifolia*), and American pokeweed (*Phytolacca americana*).

3 SITE HISTORY

The Williams parcel is formerly the site of Williams Pond, which is no longer present. The pond was created in the late 1800's along with Sawins Pond located immediately downstream of Arlington Street. The ponds were developed by George W. Sawin as part of a resort for recreational purposes and can be seen in historical maps dating to at least 1889. When the resort went out of business in the early 1900's, the ponds were purchased by the Hood Rubber Company (Hood). The Hood Rubber Company property is described as being extensive and encompassing the Sawins and Williams Pond and extending west between Arsenal Street on the south and Dexter Street to the North (Vineyard 2008a). Hood became the largest manufacturer of rubber products in the world at one time and used the ponds as a source of cooling water for the plant and as a disposal location for their wastewater. The Hood Rubber Company was later acquired by B.F. Goodrich Corporation in 1929. Contaminant releases have been reported at the Williams parcel from as far back as 1976 when an oil spill occurred and in 1983 with the report of a release of transformer fluid containing PCBs (Vineyard 2008b). The parcel was periodically monitored following this PCB release until March of 1983.

Sampling of the Williams parcel was undertaken by the City of Watertown in 1984, when the City considered purchasing the parcel. Results of the sampling indicated elevated levels of metals and petroleum in samples collected from Williams Pond and Sawins Pond (Vineyard 2008b). Following the City's sampling, the Applicant contracted with an engineering and testing company to collect surface water samples and groundwater samples at the site. Petroleum constituents (*i.e.*, benzene, toluene, ethylbenzene, and xylene) were detected in the groundwater and surface water. Additional sampling was undertaken by the engineering and testing company in 1988. The results of the testing in late the 1980s concluded that petroleum, semi-volatile organic compounds (SVOCs) and PCBs were detected in sediments and were attributable to the municipal storm drain system which discharges surface water runoff into the Williams Pond and Sawins Pond from an area of approximately 640 acres (Vineyard 2008b).

Continued investigations at the Williams parcel were completed by another consulting firm in the later 1990s in response to changes to the environmental regulations that took place in 1993. Water samples were collected from wells, and sediment samples collected. Reports prepared by Vineyard Environmental Services, Inc. (Vineyard) indicate continued reporting of Volatile Organic Compounds (VOCs), SVOCs, and metals from groundwater, soil and/or sediments. However, Vineyard reported that documents reviewed did not illustrate the locations where samples were collected (Vineyard 2008b).

The Williams parcel is identified as Release Tracking Number (RTN) 3-0457, which was issued by the MassDEP, Bureau of Waste Site Cleanup. Comprehensive site assessments have been conducted in association with this RTN and the parcel has been described as having discarded debris along the northern portion of the parcel. The debris included metal scraps, an automobile fuel tank, metal jars, cans, automobile upholstery, tires, fans, empty 5-gallon plastic buckets, glass bottles, a corroded 55-gallon drum, tubing, and tricycles (Vineyard 2008a).

Comprehensive investigations were conducted by Vineyard, which culminated with a Phase II Comprehensive Site Assessment Report and Response Action Outcome Statement (RAO) in 2008. Vineyard performed soil and sediment sampling at the parcel to evaluate the nature and extent of contaminants at the Williams parcel. The results of soil sampling at the parcel indicated the presence of beryllium, chromium, and nickel at ± 4 to 6 feet below grade surface in soils collected from the southeast side of the parcel (Vineyard, 2008a). Additional soil sampling was conducted in 2008 at this same location to evaluate the extent of the metals detected in 2007. Concentrations of nickel ranged from 7.6 milligram/kilogram (mg/kg) to 45 mg/kg. Beryllium concentrations ranged from 0.33 mg/kg to 2.6

mg/kg. Both nickel and beryllium were above the MassDEP's reportable conditions in 2006 (Vineyard 2008a).

The RAO ultimately filed identified the contaminants of concern (COCs) at this parcel to be benzo(a)pyrene, xylene, and three metals (nickel, beryllium, and chromium) in soil. The RAO issued is a class B-1 RAO, indicating that assessed conditions approach background without remediation (Vineyard 2008a).

Sediment samples collected by Vineyard during their comprehensive investigations identified PCB concentrations collected from upgradient sediment samples on the Williams parcel as ranging from 620 to 3,240 micrograms per kilogram ($\mu\text{g/kg}$). These samples were collected from 0 to 3 feet. Sediment samples collected downstream on the parcel, from a depth of 1 to 3 feet ranged from 4.7 $\mu\text{g/kg}$ to 570 $\mu\text{g/kg}$. Lower concentrations of PCBs were detected nearer the sediment surface (Vineyard 2008a).

Sediment samples collected from the Williams parcel contained concentrations of lead, nickel, copper, cadmium, mercury, and zinc. These samples also had concentrations of petroleum constituents, with Extractable Petroleum Hydrocarbons (EPH) concentrations present. SVOCs were also present in the sediments collected from the parcel. These COCs were considered to be the result of off-site sources and a downgradient property status (DPS) submittal was filed with MassDEP in 2007 for both the Williams Parcel and Sawins Pond Parcel. The DPS was limited to Sawins Pond and the wetland areas. RTN 3-29157 was created for the DPS to separate the ponds and wetland from RTN 3-0457.

MassDEP completed an audit of the documents submitted for the Williams parcel and issued a Notice of Audit findings on April 1, 2010, for the DPS Opinion and RAO Statements associated with RTNs 3-0457 and 3-29157. The audit assigned RTN 3-29157 to the DPS portion (ponds and wetlands) of RTN 3-0457. The audit did not identify any deficiencies in the RAO or DPS and concluded that the property owner, The Applicant, was not required to take any additional action.

4 RELEASE ABATEMENT MEASURE PLAN

The historical uses documented at the Williams parcel, in addition to documented off-site sources shown to have impacted the Williams parcel, have led to the degradation of the soil, sediment, and water quality. The Williams parcel has a closed regulatory status with MassDEP following their April 2010 audit. Therefore, response actions can be undertaken during the proposed building construction and residual contamination from historic activities will be managed accordingly at that time under a Release Abatement Measure (RAM) plan. These response actions will be undertaken at the Williams parcel in accordance with the Massachusetts Contingency Plan (MCP), section 310 CMR 40.1067, Remedial Actions after a Permanent or Temporary Solution Statement has been submitted to MassDEP. For this project, a RAM plan will be prepared and filed with MassDEP. For permitting this project, a draft RAM plan has been developed by the Alliance Environmental Group and is presented in Appendix D. This plan will be updated and finalized as the project is initiated.

The draft RAM plan will be formatted in accordance with 310 CMR 40.0440 and include the following:

- Name, address, telephone number, and relationship to the site of the person performing the RAM.
- A description of any release or threat of release, site conditions, and surrounding receptors.
- Objectives of the plan, implementation schedule for the RAM and any associated plans.
- A statement as to whether Remediation Waste, Remedial Wastewater, and or Remedial Additives will be excavated, collected, stored, treated discharged, or otherwise managed.

- Seal and signature of the Licensed Site Professional preparing the RAM.
- The certification required at 310 CMR 40.04425(5), if greater than 1,500 cubic yards of Remediation Wastes, are to be generated and managed at the disposal site.
- Any additional information MassDEP requires.

The RAM plan will be submitted to MassDEP prior to construction and following additional characterization of soil and groundwater conditions in the proposed footprint of the building and construction areas and wetland mitigation areas.

As part of the RAM, two days of drilling at the site will be conducted to perform one single boring to 60 feet below grade (or auger refusal) with standard penetration testing (SPT) soil sampling protocol. In addition, three to four borings will be performed to 20 feet below grade with SPT soil sampling protocol. Four 20-foot or less deep 2-inch diameter monitoring wells will be completed for groundwater gauging and chemical testing.

Soil samples will be analyzed for grainsize and testing of general MassDEP quarry reuse facility parameters VOCs, Poly Aromatic Hydrocarbons, Total Petroleum Hydrocarbons, metals-12, Toxicity Characteristic Leaching Procedure for lead (TCLP-Pb), Flashpoint/Reactivity/Conductivity/pH). Groundwater samples will be submitted for laboratory testing of Volatile Petroleum Hydrocarbons, EPH, metals-13, dissolved iron, and total suspended solids. Sediment samples will be analyzed for similar parameters.

The results of the sampling effort will be included with the RAM and used to determine soil and water management, as well as geotechnical information required for building.

5 JURISDICTIONAL RESOURCE AREAS

Jurisdictional resources were delineated and an ANRAD was submitted to the Commission and MassDEP. An Order of Resource Area Delineation (ORAD) was issued by the Commission on July 17, 2019 (Appendix E). Sheet 1, ANRAD Plan, illustrates the jurisdictional resources approved for the Williams parcel in the ORAD. These resources include Land Under Water (LUW), Bank, and RFA associated with the stream as well as BVW. Bordering Land Subject to Flooding is not present at the Williams parcel as illustrated on Figure 3, the 100-year floodplain (Federal Emergency Management Agency [FEMA] 2021).

5.1 Natural Heritage and Endangered Species Program

As part of the ANRAD submittal, SWCA reviewed the Massachusetts Geographic Information System (MassGIS) database to determine if the project was located within or adjacent to areas designated as Natural Heritage and Endangered Species Program (NHESP) Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, certified vernal pools, or potential vernal pools. The NHESP database was again reviewed as part of this submittal. As shown on the NHESP figure (Figure 4, Appendix A), there are no mapped certified or potential vernal pools for this site and no mapped Priority or Estimated Habitats (MassGIS 2017).

5.2 Outstanding Resource Waters and Areas of Critical Environmental Concern

SWCA reviewed the MassGIS data layers to determine if the project location coincides with Areas of Critical Environmental Concern (ACECs) or Outstanding Resource Waters (ORWs) as part of the ANRAD and as part of this NOI submittal. ACECs are areas designated in Massachusetts that receive special recognition because of the quality, uniqueness, and significance of its natural and/or cultural resources. ORWs are watershed areas that have been classified as such under the Massachusetts Surface Water Quality Standards. These watersheds constitute an outstanding resource as determined by their important socioeconomic, recreational, ecological and/or aesthetic values and have been identified so that they may be protected and maintained. SWCA determined that neither ORWs nor ACECs are associated with the project area or parcel (MassGIS, 2009 and 2010).

6 PROPOSED PROJECT

The project proposes the construction of a mixed-use building accessed from Arlington Street and Elm Street. The civil design plan set was developed by Engineering Alliance and is presented in Appendix B. The jurisdictional resource areas approved by the Commission under the ORAD plan were incorporated into the civil design plan set so that temporary and permanent impacts could be determined. The Cover Sheet (C-O) to the plan set illustrates the proposed building, parking areas, and access routes from Arlington and Elm Streets. Existing conditions and erosion controls are illustrated Sheet C-1. SWCA has also prepared a wetland mitigation plan as illustrated on Sheets L-1 and L-2 in Appendix B.

The project proposes the following:

- Construct a new building in accordance with the Watertown Zoning Ordinance (amended December 11, 2018) for RMUD designated parcels.
- Improve the aesthetics of the parcel.
- Repair the headwall at the west side of the site (Elm Street) and install a water quality structure at the discharge point between the existing culvert and BVW to improve water quality of the on-site stream.
- Restore and enhance the functions and services of the existing BVW and RFA by removing invasive species, removing urban refuse where and to the extent practicable, and planting native species.
- Address contaminated soils, when encountered, under a RAM plan.
- Reuse contaminated soil on-site or dispose of contaminated soil in accordance with a RAM plan.
- Create $\pm 6,390$ square feet (± 0.15 -acre) of on-site and in-kind wetland mitigation ($\pm 11\%$ of the parcel).
- Improve the features and functions of on-site wildlife habitat.

The project is being proposed to develop a commercial building in Watertown on a parcel zoned as RMUD and not located within any sensitive overlay districts. The building has been proposed in accordance with the land use table for a parcel zoned RMUD, and no zoning variances or waivers to the requirements are being requested. The parcel has limited space and the building, parking, and associated features have been designed to avoid and minimize impact to the maximum extent practicable. Where impacts are unavoidable, compensatory mitigation is proposed.

The intent of RUMD or Regional Mixed Use District has been to enact, assist, and promote the conversion of the Arsenal Street Corridor. It was established to promote mixed use development and enhance the quality of life by promoting the development of a high-quality public realm (Watertown Zoning Ordinance 2018). The project is consistent with the RMUD and will accomplish the following:

1. *“Facilitate transformative development consistent with Watertown’s goal to promote mixed use development that includes a mix of larger and smaller scale retail, office, hospitality, multi-family residential and research and development uses, and that serves regional demand.”*

This project is proposed in support of this objective. It provides a small-scale mixed-use development for retail and warehouse use. It is also proposing a project that has less adverse effects on the interests of the WPA and the Ordinance than previously proposed projects for this parcel.

2. *“Allow development at a density, scale and character appropriate to define a corridor that is a major gateway for the Town...”*

To restate, this project is being proposed in support of the RMUD objectives. It is also proposing a project that has less adverse effects on the interests of the WPA than previously proposed projects for this parcel.

3. *“Enhance the quality of life, including promoting the development of a high quality public realm...”*

Development proposed is to be aesthetically pleasing and consistent with Watertown’s Design Guidelines, provides a pedestrian environment, and promotes frontage that create connections to surrounding neighborhoods and the Charles River. Again, this project is being proposed in support of the RMUD objectives.

4. *“Enhance publicly available open space networks by connecting to and integrating with adjacent state, municipal and privately-owned parcels, where appropriate, encouraging private land owners to permanently preserve open space, being sensitive to the Charles River reservation, and furthering private remediation and public access to Sawins Brook and Pond and Williams Pond.”*

The Williams parcel has been contaminated with metals, petroleum, and other contaminants of concern as discussed in Section 3. The project proposes a building that incorporates mitigating for, and enhancing of, BVW and RFA at the site that will remain as open space. Prior to and during construction, soil, sediment, and groundwater samples will be collected and analyzed. The results of which will guide the cleanup of site conditions in accordance with a RAM plan (Section 4). The project provides for a building as promoted in the RMUD district, addresses contamination, and mitigates for and enhances wetland impacts.

5. *“Respect historic assets and architectural features that help define the character of the community and encourage preservation and restoration of historic buildings.”*

The project does not impact historic buildings.

6. *“Incentivize real estate investment that will enhance the diversity and maximize the value of the Town’s tax base.”*

The project provides a building that will maximize the Town’s tax base, while proposing a project that has less adverse effects on the interests of the WPA than previously proposed projects for this parcel.

7. *“Use ‘green’ building practices that encourage energy efficiency, manage stormwater, protect the riparian habitat, and are planned, designed, constructed, and managed to minimize adverse environmental impacts.”*

The project has been designed to be efficient and manage stormwater in a manner that reduces contaminants from entering the BVW and stream on this parcel. Previous projects proposed for this site had greater impacts to jurisdictional resource areas, and this project has been designed to reduce impacts and mitigate for impacts to BVW and RFA. The project proposes restoring the functions and services of BVW and RFA and reducing the number of invasive species present at the parcel.

Existing vegetation in the BVW includes silver maple, catalpa, broadleaf cattail (*Typha latifolia*), common rush (*Juncus effusus*), jewelweed (*Impatiens capensis*), Japanese knotweed (*Reynoutria japonica*), and Asian bittersweet (*Celastrus orbiculatus*). Invasive species dominate much of this surrounding area and site, including the upland areas. With the exception of the garden area, the uplands at the site are dominated by mixed tree species including, but not limited to: silver maple, catalpa, box elder.

This project proposes the removal of invasive species within select areas of the mitigation and planting native species.

8. *“Encourage development that accommodates and promotes multi-modal access, transit between the Arsenal Corridor and mass transit stops, management of transportation demand to reduce automobile use, and mitigates deterioration of the level of affected intersection service for all transportation modes”.*

The project has been designed to accommodate transit in the Arsenal Corridor. Parking is available in association with the proposed building use. Access will be one way onto the parcel, with the entrance off Arlington Street and exit limited to Elm Street.

6.1 Building Construction

The proposed building will be a two story, $\pm 7,150$ sf building constructed on a concrete slab floor, constructed in the northwest portion of the Williams parcel. The building will include $\pm 3,500$ sf of retail space and $\pm 3,650$ sf of warehouse space on the first floor, and $\pm 7,150$ sf of warehouse space on the second floor. The property will be accessed by driveways on both Elm Street and Arlington Street. One-way entry will be provided by way of a ± 16 -foot driveway from Elm Street. A two-way entry will be provided by way of a ± 24 -foot driveway from Arlington Street. Parking will be associated with the driveway from Arlington Street, and vehicles will only exit the property onto Arlington Street (Engineering Alliance 2021). During construction, a combination of silt fence and haybale barriers (Sheet D-2) will be utilized with BioWattle erosion controls when constructing the mitigation areas (Sheet L-2).

The construction of the building and portions of the driveway/parking area will impact $\pm 4,215$ sf of BVW as shown on Sheet C-2. Fill will need to be placed in this area of wetland to construct the building as the elevations at the northwest and west side of the Williams parcel range from ± 19 feet to ± 11 feet in elevation and slope toward the stream. The impact to this portion of the wetland will be replicated by constructing a total of $\pm 6,930$ sf of wetland on-site to off-set these impacts. Three replication areas are proposed, with one at the southwest side of the existing stream and the other two located along the southern side of the stream. These areas are illustrated on the Site Layout Plan, C-2.

Drainage at the site enters the Williams parcel upstream from an existing 24-inch culvert that supports the existing stream and adjacent BVW. The headwall for this culvert is in disrepair and will be repaired by installation of a water quality structure at the discharge point between the existing culvert and BVW. A new headwall will also be constructed as part of the wetland replication.

6.2 Stormwater Management

Engineering Alliance prepared drainage calculations and a stormwater management plan in support of this project. Drainage calculations for existing conditions were prepared for the 2, 10, 25, and 100-year Type II 24-hour storm event (Engineering Alliance 2020). The existing conditions drainage analysis was comprised of one watershed area that drains by way of surface flow to the 6-foot wide culvert. The results for these storm events were calculated to be 2.21 cubic feet per second (cfs), 4.49 cfs, 5.96 cfs, and 8.23 cfs, respectively (Engineering Alliance 2021). A copy of the stormwater report is presented in Appendix F.

The proposed conditions, including construction of the building, driveways, parking areas, and landscaping areas was then calculated in the same manner as existing conditions for the same storm events. The results were 1.56 cfs, 3.06 cfs, 4.01 cfs, and 6.69 cfs and do not exceed existing conditions rates (Engineering Alliance 2021).

As part of managing stormwater, the project will include facilities to attenuate peak flows generated by all storm events up to and including the 100-year storm event. These facilities include a porous asphalt parking area that includes an 18-inch crushed stone bed (Engineering Alliance 2020). Treebox filters have also been proposed at low points in the porous asphalt parking area as emergency overflow spillways in the event of extreme storms and or failure of the asphalt. The treebox filter drains will discharge to an overflow manhole and ultimately through an overflow pipe daylighting beyond the proposed retaining wall along the parking area (Engineering Alliance 2021).

The Applicant has developed the project in accordance with standards established by the Department. The drainage calculations and a stormwater management plan developed in support of this project utilized drainage calculations for the 2, 10, 25, and 100-year Type II 24-hour storm event (Engineering Alliance 2020). Low Impact Development measures are included, specifically, treebox filters are included in the design and porous asphalt will be utilized.

Engineering Alliance has provided the MassDEP checklist for stormwater with their report in Appendix F. The following summarizes the Project's compliance with the Massachusetts Stormwater Standards.

Standard 1 – No New Untreated Discharges. There are 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.

Standard 2 – Peak Rate Attenuation. This is met with calculations showing that the post-development peak discharge rates do not exceed pre-development rates for the 2-year, 10-year and 24-hour storm. Calculations also show the post-development peak discharge rates do not exceed pre-development rates for the 100-year and 24-hour storm.

Standard 3 – Recharge. Recharge standards are met with required recharge volume calculations provided and sizing the infiltration Best management Practices (BMP) is based on static methods. Recharge BMPs have been sized to infiltrate the required recharge volume and calculations showing that the infiltration BMPs will drain in 72 hours are provided.

Standard 4 – Water Quality. Standards are met as a long-term pollution prevention plan is provided with the Stormwater Report in Appendix F. Calculations documenting that the treatment train meets the 80% Total Suspended Solids (TSS) removal requirement and, if applicable the 44% TSS removal pretreatment requirement, are provided with the Stormwater Report. In addition, BMPs sized are based on the ½-inch or 1-inch Water Quality Volume and calculations are provided. Also, the Applicant proposes to use proprietary BMPs.

Standard 5 – Land Uses with Higher Potential Pollutant Loads. This is met. The National Pollutant Discharge Elimination System Multi-Sector General Permit does not cover the subject Land Use.

Standard 6 – Critical Areas. Not applicable. This project will not discharge near or directly to any critical areas.

Standard 7 – Redevelopments and other Projects Subject to the Standards only to the maximum extent practicable. This is a redevelopment and is subject to the standards only to the maximum extent practicable.

Standard 8 – Construction Period Pollution Prevention and Erosion and Sedimentation Control. This report is included with the Stormwater Report. This project is not covered by a NPDES Construction General Permit since the project proposes less than 1 acre of disturbance.

Standard 9 – A Operation and Maintenance Plan. A plan is provided with the Stormwater Report.

Standard 10 – Prohibition of Illicit Discharges. An illicit discharge compliance statement is included with the stormwater checklist in the Stormwater Report.

7 REGULATORY COMPLIANCE

7.1 Resource Area Impacts

The site is ±1.42 acres and all work proposed will be within areas regulated by the WPA as well as the Wetlands Ordinance. Site work will be located entirely in the WPA 100-foot Buffer Zone to BVW as well as Wetlands Ordinance 150-foot Buffer Zone to BVW and the 50-foot no build zone. The proposed work will also be entirely within the RFA to the on-site stream as regulated by the WPA and Wetland Ordinance. Table 1 summarizes the project's proposed impacts to different resource areas on the site and Tables 2 and 3 summarize how the project complies with the provisions of the WPA.

Table 1. Summary of Proposed Impacts

Resource Area	Impact (sf)	Impact (acres)	Percentage of Parcel
RFA (0–100')	22,059	0.51	36%
RFA (100'–200')	1,912	0.04	3%
BVW	4,215	0.10	7%
Buffer Zone to BVW (0–50')	18,768	0.43	36%
Buffer Zone to BVW (50–100')	990	0.02	2%
Buffer Zone to BVW (0–150')	19,758	0.45	38%

Note: Resource areas overlap (*i.e., BVW and RFA). Impacts are not cumulative.

Table 2. General Provisions of the Wetlands Protection Act (310 CMR 10.03)

Citation	Regulation	Compliance
310 CMR 10.03(1)(a)1.	The area is not significant to the protection of any of the interests identified in the WPA.	Regulated resources within the project area have been significantly degraded from historic contamination and dumping. The proposed project includes mitigation and restoration of BVW and RFA, resulting in a net ecological uplift, thereby increasing that function and services of those resources and protecting the interests of the Act.
310 CMR 10.03(1)(a)2.	Work within a resource area will contribute to the protection of the interests of the WPA.	Ultimately the work will result in ecological enhancement of the BVW, improvement to RFA, and will better protect the resource areas. This will contribute to better protecting the interests of the WPA.
310 CMR 10.03(1)(a)3.	Work within the buffer zone will contribute to the protection of the interests of the WPA.	Work in the buffer zone will require temporary impacts; but, the area will ultimately be improved with the removal of invasive species, restoration of the area with native plants and trees, and removal of refuse. All of this will contribute to further protecting the interests of the WPA.
310 CMR 10.03(1)(b)	Claims of work outside of any jurisdictional area impacting a jurisdictional area must demonstrate the work has had an adverse impact.	Not applicable.
310 CMR 10.03(2)	Credible evidence from a competent source to support the position taken when contesting MassDEP's position.	Not applicable.
310 CMR 10.03(3)	Installation of subsurface sewage disposal systems.	Not applicable.
310 CMR 10.03(4)	Presumption concerning point-source discharges.	Not applicable.
310 CMR 10.03(5)	Each resource area is presumed to be significant to the interests of the WPA.	Resource area at the site are presumed to be significant, but highly degraded. Project improvements will improve the functions and services of BVW and RFA including enhancement of habitat quality, thereby protecting the interests of the WPA.
310 CMR 10.03(6)	Presumption concerning the application of herbicides.	Not applicable.
310 CMR 10.03(7)(a)	Filing fees for NOIs pursuant to the WPA.	Copies of checks are included in Appendix C. The work meets the requirements of a Category 3.b activity, construction of any commercial development.

Table 3. General Provisions of Inland Resource Areas (310 CMR 10.53)

Citation	Regulation	Compliance
310 CMR 10.53(1)	Significance of resource areas with no presumption to the protection of the interests of the WPA and work within the buffer zone reviewable under the Regulations.	Not applicable. BVW and RFA, the two resource proposed to be impacted by the project, include presumptions in the Regulations at 310 CMR 10.55(3) and 310 CMR 10.58(3), respectively.
310 CMR 10.53(2)	Proposed projects subject to a Restriction Order.	Not applicable.
310 CMR 10.53(3)	Projects that may be permitted as a limited project.	Not applicable.
310 CMR 10.53(4)	Ecological restoration limited projects.	Not applicable.
310 CMR 10.53(5)	Agricultural limited projects.	Not applicable.
310 CMR 10.53(6)	Limited projects related to footpaths, bike paths, and other pedestrian or nonmotorized vehicle access within RFA but outside of outside of other resource areas.	Not applicable.
310 CMR 10.53(7)	Operation and maintenance plans for public or private infrastructure.	Not applicable.
310 CMR 10.53(8)	Stream crossings.	Not applicable.

7.2 Bank

Bank at the parcel is associated with Williams Brook and will not be altered during construction of the building and associated proposed project features. Bank will not be impacted during the construction of new wetlands associated with the mitigation areas along the south side of the stream. This work is illustrated on Sheet L-1.

7.3 Bordering Vegetated Wetland

BVW is located along the north and south sides of Williams Brook as illustrated on the project plans, and Sheet L-1. Vegetation within the BVW includes silver maple, catalpa, cattail, common rush, jewelweed, Japanese knotweed, and bittersweet. This project will impact 4,215 sf of BVW associated with the proposed building. Pursuant to 310 CMR 10.55(4)(b), work which results in the loss of up to 5,000 sf of BVW may be permitted if the area of loss is replaced in accordance with seven general standards. SWCA completed a Detailed Wildlife Habitat Evaluation at proposed BVW impact areas and quantified significant wildlife habitat features, if present, to be included in the wetland mitigation plan (see Section 7.3.2).

7.3.1 Performance Standards

Performance standards for BVW are summarized in Table 4. .

Table 4 Performance Standards for Bordering Vegetated Wetland (310 CMR 10.55(4))

Citation	Regulation	Compliance
310 CMR 10.55(4)(a)	Work shall not destroy or otherwise impair any portion of said area.	The proposed project will not impair but improve the area of BVW by removing invasive species and planting native species.
310 CMR 10.55(b)1.	Surface area of the replacement area to be created shall be equal to that of the area that will be lost.	The area to be lost is $\pm 4,215$ sf. The surface of the replacement area will be $\pm 6,930$ sf. A wetland replication area will be constructed at the southwest corner of the property, on the north side of the stream ($\pm 1,725$ sf) and the remainder of the replication area will be on the south side of the stream ($\pm 5,025$ sf). Mitigation plans with details and notes have been developed and presented as Sheet L-1 and L-2 in Appendix B.
310 CMR 10.55(b)2.	Ground water and surface elevation of the replacement.	The proposed replication areas will be located adjacent to the existing stream and existing BVW at similar elevations to the existing BVW. Restoration is to be conducted under the guidance of a Professional Wetland Scientist, as indicated on Sheet L-1.
310 CMR 10.55(b)3.	Overall horizontal configuration and location of the replacement area.	The proposed replication areas are adjacent to Williams Brook and replication areas are within 50 feet of the impacted wetlands.
310 CMR 10.55(b)4.	Unrestricted hydraulic connection to the same water body or waterway as the lost area.	The replacement area and the impact area are both hydrologically connected to Williams Brook on the Williams Parcel. The replication areas will be connected to the existing BVW on the north and south side of the stream and will have unrestricted hydrologic connectivity to the stream.
310 CMR 10.55(b)5.	Replacement area shall be located within the same general area of the water body or reach of the waterway as the lost area.	The replacement area is in the same general area as the lost area, located within 50 feet of the impact area. It is adjacent to the existing onsite stream.
310 CMR 10.55(b)6.	Reestablishment of native vegetation and vegetative stabilization of replacement area.	Wetland mitigation notes are provided on Sheets L-1 and L-2. Note 3 specifies that a minimum of 75% cover with native species will be achieved within two years. Note 4 specifies that natural fiber compost filter tubes will be established around the replacement area.
310 CMR 10.55(b)7.	Replacement area shall be provided consistent with other General Performance Standards for each resource area.	This standard for each resource area will be provided in a manner consistent with the applicable resource standards.
310 CMR 10.55(c)	Loss of BVW of less than 500-square feet, is in a distinct linear configuration, and it is not reasonable to further avoid or minimize impacts.	Not applicable.
310 CMR 10.55(d)	Rare species	Not applicable. The Project is not located within any mapped rare species habitat.
310 CMR 10.55(e)	ACECs	Not applicable. The Project is not located within an ACEC.

7.4 Land Under Water

LUW is associated with Williams Brook at the parcel. No work will be conducted within LUW. Therefore, the performance standards at 310 CMR 10.56(4) are not applicable.

7.5 Riverfront Area

The RFA at the Williams Parcel is associated with the Williams Brook and RFA encompasses the entire site as the parcel is only ± 1.42 acres. The project is being proposed as a redevelopment project as outlined in 310 CMR 10.58(5) as it has been an abandoned dumping ground associated with the former property uses in the 1900s, with fill and debris present. As outlined in Section 3 the RFA has been degraded since owned by Hood in the 1920's. Water from Williams Parcel was used as cooling water for the Hood manufacturing plant and for disposal location for their wastewater (Vineyard 2008a). In the 1980's additional impacts to the Williams Parcel were related to petroleum and PCB releases to Williams Brook. The Williams Parcel has been used as a disposal area for junk as also discussed in Section 3. The Applicant is proposing the redevelopment of this RFA to reuse a portion of the degraded areas.

The proposed work will improve the existing conditions and capacity of the RFA to protect the interests of the WPA and will result in an ecological uplift to the resource area. Enhancement of the RFA is proposed by removing trash and debris, addressing and disposing of contaminated soils, planting of native trees and other vegetation, and removal of invasive species.

- Trash and debris at the site will be removed from the RFA including areas of RFA that occur as BVW.
- Contaminated soils in RFA will be addressed and disposed of in accordance with the MCP.
- The RFA on the north side of the site has no trees and is currently used as a garden. As part of the proposed restoration of RFA, native tree species will be planted at the north side.
- The south side of Williams Brook will be planted with red maple trees (*Acer rubrum*) and American hornbeam (*Carpinus caroliniana*) as shown on Sheet L-1 and L-2. This will improve RFA conditions and wildlife habitat.
- The work in the RFA also includes work within BVW and Bank. The proposed work will also improve the functions and services of these resource areas as well as the features and functions of wildlife habitat.

Stormwater management will be an integral part of this project and conducted in accordance with the standards established by MassDEP (310 CMR 10.58(5)(b)). This is described in Section 7.2, which describes how stormwater for the project will be improved in this RFA.

With the construction of the building and mitigation areas for BVW and uplands in the RFA, debris will be removed and properly disposed of off-site. Large diameter trees along the south side of the stream will be retained as much as practicable and new native tree species will be planted along the stream. Work will require grading and the addition of clean topsoil with sufficient organic matter for the mitigation areas and as part of the installation of native plantings in the existing BVW north of the stream. Sheet L-1 provides the list of plantings to be installed.

Mitigation in the RFA will be supervised by a Professional Wetland Scientist that will be on site to verify the limits of work, check and confirm grades, confirm the proposed plantings are installed as required, and monitor construction. Plantings and mitigation areas will be monitored twice annually to assure that 75% cover with native plants is established at the site within 2 years of installation and to ensure invasive species do not re-establish.

7.5.1 Performance Standards

As a redevelopment project, the proposed project is not subject to the General Performance Standards of the WPA under 310 CMR 10.58(4)(a-b). However, the project is subject to 310 CMR 10.58(c-d) as well as the provisions under 310 CMR 10.58(f) as summarized in Table 5.

Table 5. Redevelopment within Previously Developed Riverfront Area (310 CMR 10.58(5))

Citation	Regulation	Compliance
310 CMR 10.58(4)(c)	Alternatives	Four alternatives were evaluated (see Section 7.5.3).
310 CMR 10.58(4)(d)	No significant adverse effect.	The project will not result in a significant adverse effect as the project proposes enhancement and restoration of the degraded RFA, meets the Massachusetts Stormwater Standards, does not impact important wildlife habitat features or functions (see Section 7.6), and will not impair groundwater or surface water.
310 CMR 10.58(5)(a)	Work shall be an improvement of existing conditions.	The proposed project includes enhancement of BVW and RFA including removal of invasive species, planting of native species, and removal debris, thereby resulting in a net ecological uplift.
310 CMR 10.58(5)(b)	Stormwater management.	Stormwater management has been provided according to the standards. See Section 6.2.
310 CMR 10.58(5)(c)	Within 200-foot RFA, no work closer to the river than existing conditions or 100-feet.	The existing conditions include abandoned dumping grounds, contamination, and degradation up to the Banks of the stream. The proposed project does not expand impacts within RFA beyond those existing conditions.
310 CMR 10.58(5)(d)	Proposed work to be located outside of RFA or toward RFA boundary.	Not applicable. Work is being conducted in accordance with 310 CMR 10.58(5)(f).
310 CMR 10.58(5)(e)	Work shall not exceed degraded area.	The entire work area is degraded from historic contamination and dumping of refuse. The proposed project will not expand these existing conditions and will improve existing conditions through mitigation of BVW impacts and enhancement of RFA in accordance with 310 CMR 10.58(5)(f).
310 CMR 10.58(5)(f)	Restoration of on-site degraded RFA.	Restoration is being proposed at a ratio of 1:1 as required. See Section 7.5.2 below.
310 CMR 10.58(5)(g)	Mitigation on-site or in the same general area of the river basin.	Not Applicable. The proposed work conforms to the applicable provisions at 310 CMR 10.58(5)(f).
310 CMR 10.58(5)(h)	Prohibition of further alteration within RFA.	The Certificate of Compliance will include a continuing condition.

7.5.2 Riverfront Area Mitigation

The Applicant is proposing this project in accordance with 310 CMR 10.58(5)(f). In accordance with this section, the removal of any existing surficial debris and trash that includes hard plastic, metal, and lumber at the Williams Parcel. The project also proposes to retain larger mature trees located on the south side of the Williams Parcel and south side of the stream as practicable. The project has also been developed so that site grading will reduce runoff and increase infiltration, provide topsoil at a depth consistent with the natural conditions and seeding and planting will include native species (see Sheets L-1 and L-2).

The proposed work will improve the existing degraded conditions of the RFA and will protect the interests of the WPA. In accordance with 310 CMR 10.58(5)(f), restoration of the RFA is proposed by:

- Trash and debris at the site will be removed from the RFA including areas of RFA that occur as BVW.
- Contaminated soils in RFA will be addressed and disposed of in accordance with the Massachusetts cleanup regulations, the MCP.
- The RFA on the north side of the site has no trees and is currently used as a garden. As part of the proposed restoration of RFA, native tree species will be planted at the north side.
- The south side of Williams Brook will be planted with red maple trees (*Acer rubrum*) and American hornbeam (*Carpinus caroliniana*) as shown on Sheet L-1 and L-2. This will improve RFA conditions and wildlife habitat.
- The work in the RFA also includes work within BVW and Bank. The proposed work will also improve the functions and services of these resource areas as well as the features and functions of wildlife habitat.

Table 6 outlines proposed measures address the ratio square feet of at least 1:1 of restored area to area of alteration not conforming to the 310 CMR 10.58(5)(f) criteria outlined above. Restoration shall include:

Table 6. Restoration Conformance

Restored Area	310 CMR 10.58(5)(f) Conformance Criteria (1–4)	Restoration Square Footage
Grading and Replanting Mitigation Areas	2,3,4	6,930
Trash removal, invasive removal, and revegetation	1,4	6,080
Trash removal and invasive removal (BVW)	1	9,925
Trash removal and invasive removal (Upland RFA)	1	8,030
Area of conforming RFA restoration		30,425
<i>Area of non-conforming RFA alteration</i>		<i>23,971</i>
1:1 Conformance ratio (conforming:non-conforming)		1.27:1

7.5.3 Alternatives Analysis

The Applicant, together with environmental consultants, engineers, and hazardous waste contractors, has considered several alternative concept design plans for the Williams Parcel. As stated in Section 3 the site is degraded. Hazardous waste assessments, RAO and DPS for the Williams parcel were reviewed under an audit by MassDEP. The audit did not identify any deficiencies in the RAO or DPS and concluded that the property owner does not need to undertake further action. The Applicant's team has evaluated alternatives to develop a project at the Williams parcel and protect the interests of the WPA and Wetlands Ordinance. The alternatives evaluated include removal of debris, addressing limited removal of contaminants of concern encountered during construction, and the removal of these contaminants of concern. Addressing contaminants of concern as part of development is cost effective for the Applicant, under the guidelines of a RAM plan. Cleanup and direct disposal of contaminants at the site alone are very cost restrictive to the Applicant, as removal of soil can be upwards of \$400/ton or more depending on the contaminant of concern. The regulatory method to address contaminants under a RAM plan is financially feasible. Five alternatives were analyzed by the Applicant's team.

No Action Alternative. This is not a feasible alternative as it does not meet the project objective of developing the land in accordance with RMUD guidelines. This alternative would not result in any impacts to resource areas; however, it does not provide for limited removal of contaminants of concern during construction. The potential risk of contaminants of concern have been present since the 1920's and some are the result of impacts from upgradient sources. The No Action alternative will continue to allow untreated stormwater to enter the Williams Parcel from upgradient and perpetuate the problems. Untreated stormwater flowing through the Williams Parcel will continue flowing downstream to Sawins Pond and other water resources.

Alternative 2. In 2016, the Applicant provided an Environmental Notification Form to the Massachusetts Environmental Policy Act Office which is part of the Environmental Office of Energy and the Environment. The proposed project included the removal of contaminated sediment from Sawins Pond that would be contained on the Williams parcel. In doing so it was proposed that Williams Brook and BVW on the Williams parcel would be permanently filled and replaced by realigning the stream and mitigating for BVW loss. The resource areas on the Williams parcel were to be filled with up to 8,000 cubic yards of sediment dredged from Sawins Pond, placed behind a barrier, and capped with 3-feet of clean fill. This alternative involved significant impacts to the jurisdictional resource areas on the Williams Parcel and located additional contaminated materials on the Williams parcel. While that concept plan quantified impacts to the parcel in conjunction with the adjoining parcel (including Sawins Pond), the estimated impacts included ± 1.39 acres of impervious surface area, ± 5 acres of land alteration, $\pm 22,275$ sf of new BVW alteration, ± 375 linear feet of new Bank alteration, and $\pm 8,000$ cubic yards of LUW alteration associated with the rubber waste removal from Sawins Pond.

Alternative 2 was deemed not economically feasible and did not propose clean up at the Williams parcel. Additionally, this alternative results in greater adverse environmental effects on the Williams parcel and requires significant re-alignment of the stream and entire site with greater resource area impacts. Therefore, Alternative 2 was not selected as the preferred alternative.

Alternative 3. This design concept developed in 2018 includes relocating BVW from the southern side of the site to the northern side of the site and the development of an $\pm 8,585$ square foot building and associated parking. The plan included relocating ± 366 linear feet of existing stream, creating ± 432 linear feet of new stream channel, and greater than 5,000 sf of potential wetlands lost due to development.

Alternative 3 would result in greater adverse environmental effects on the Williams parcel and requires significant re-alignment of the stream and entire site with greater resource area impacts. Therefore, Alternative 3 was not selected as the preferred alternative.

Alternative 4. This alternative proposes development of the parcel in accordance with the RMUD guidelines and applicable Watertown zoning regulations. Alternative 4 would result in $\pm 4,900$ sf of BVW impacts related to site cleanup in accordance with a RAM Plan and a wetland mitigation plan in accordance with the WPA Wetlands Ordinance, resulting in an increase to the amount of wetlands at the parcel.

Alternative 4 would result in greater adverse environmental effects on the Williams parcel and was therefore not selected as the preferred alternative.

Preferred Alternative. This alternative proposes to develop the parcel in accordance with the RMUD guidelines and applicable Watertown zoning regulations. It also includes resource area mitigation in accordance with the WPA and Wetlands Ordinance to BVW and RFA. The Preferred Alternative will result in a net increase in the square footage of wetlands on the parcel, will include removal of invasive species and urban refuse, plant native species, and improve the functions and services of the resource areas which will result in a net ecological benefit to the interests of the WPA and Wetland Ordinance.

This will improve and diversify the resource areas. The proposed project will include cleanup at the site in accordance with a RAM Plan and the parcel will be improved from an ecological standpoint as well as improving the aesthetics of the local area.

This alternative was selected as the Preferred Alternative as it will result in the least adverse environmental impacts on the Williams parcel and achieves the project objective of developing a commercial building.

7.6 Wildlife Habitat Evaluation

As stated at 310 CMR 10.60(3), alterations of wildlife habitat characteristics beyond permissible thresholds may be restored onsite with the following general conditions to insure that the standards in 310 CMR 10.60(1)(a) is satisfied, including the surface of the replacement area to be created shall be equal to that of the area that will be lost (10.60(3)(a); the elevation of groundwater relative to the surface of the replacement area shall be approximately equal to the lost area (10.60(3)(b); the replacement area shall be located within the same general area as the lost area (10.60(3)(c); interspersed and diversity of vegetation, water, and other wildlife habitat characteristics of the replacement area shall be similar to the lost area (10.60(3)(d).

SWCA completed a detailed Wildlife Habitat Evaluation, as outlined in the *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands* (Wildlife Guidance) (MassDEP 2006), for proposed impacts to BVW on February 22, 2021 (see Appendix G). The purpose of the wildlife habitat evaluation was to document important wildlife habitat features in order to demonstrate the project will result in no adverse effect. The WPA regulations define adverse effects on wildlife habitat as the alteration of any habitat characteristics listed in 310 CMR 10.62(2) such as plant community, soil structure, and hydrologic regime. For example, insofar as such alteration will, following two growing seasons of project completion or the regeneration of replanted trees, substantially reduce its capacity to provide important wildlife habitat functions listed in 310 CMR 10.60(2), such as shelter, breeding areas, nesting sites, etc.

Proposed impacts to BVW are below the ‘significance’ threshold as outlined in Appendix A of the Wildlife Guidance (*i.e.*, 5,000 sf); however, SWCA identified several important wildlife habitat characteristics to be incorporated into the wetland mitigation design. Important wildlife habitat features identified within the proposed BVW impact area include two standing dead trees approximately <12 inches in diameter (*i.e.*, snags) which provide woodpecker foraging habitat and/or nesting cavity sites, cover habitat for small to medium sized mammals (*e.g.*, coarse woody debris and dense vegetation), fruit and mast-producing vegetation, and nesting habitat for birds. The site additionally functions as part of an important wildlife corridor within a fragmented, urban landscape, connecting to Sawins Pond to the east.

Dense vegetative cover is an important habitat function at the site for nesting birds, small mammals, and meso mammals. No adverse impacts are proposed to these habitat features as vegetation community will be improved as a result of the wetland mitigation, shrub enhancement, and the removal of trash and debris. Plant species included in the wetland restoration seed mix provide nectar sources for pollinators. Shrubs which provide important wildlife food sources, such as dogwoods (*Cornus amomum*, *C. racemosa*), black elderberry (*Sambucus nigra*), northern arrowwood (*Viburnum dentatum*), and were selected to increase wildlife habitat food and cover value. The addition of native shrub and tree species will increase the vegetative diversity. The removal of selective invasive species, such as Asian bittersweet will improve wildlife food value, as bittersweet fruit has been shown to have a deleterious effect on migrating neotropical songbirds since it is nutritionally inadequate (Smith *et al.* 2007).

All areas of undisturbed RFA are presumed to be significant for wildlife habitat. However, different review requirements apply depending on whether the RFA is degraded (310 CMR 10.58(5)). SWCA

completed a Detailed Wildlife Habitat Evaluation for proposed RFA impacts to incorporate any potential significant wildlife habitat features into the mitigation plan, the shrub enhancement plan, and the upland stabilization area. While important wildlife habitat features such as cover habitat exist within the RFA area, no adverse impacts are proposed to important wildlife habitat features within RFA as all features are proposed to be replicated in the wetland mitigation plan. Further, the habitat will be ecologically improved as higher quality food sources will be planted, vegetative diversity will be increased, selected invasive species and trash will be removed, and valuable wildlife food source will be increased. Further, the addition of 768 trees and shrubs will decrease thermal loading within the stream channel, mitigate stormwater inputs from offsite discharges associated with impervious surface areas (i.e., to the south of the restoration area), and provide additional cover habitat. No changes to the site functionality as an important wildlife corridor area are proposed but will be enhanced because of the mitigation.

In accordance with 310 CMR 10.60(3), adverse impacts will be avoided through on-site restoration and mitigation. The site is not located within Habitat of Potential Regional or Statewide Importance or certified or documented vernal pool habitat.

The site is not located within Habitat of Potential Regional or Statewide Importance or certified or potential vernal pool.

8 WATERTOWN WETLAND ORDINANCE

The City of Watertown has enacted a Wetlands Ordinance, which regulates jurisdictional resource areas beyond the WPA including rivers/streams, wetlands, Bank, LUW, and any land within 200 feet of a river or perennial stream. The Wetlands Ordinance also has a 150-foot buffer zone to BVW and Bank as well as a 50 foot no-build zone. This project proposes work within BVW, Bank, and within 200-feet of a stream. The Applicant requests approval to complete the proposed work in the buffer zone and requests a waiver to the 50-foot no work zone.

The Applicant has provided an alternatives analysis which illustrates their interest in developing the project and that there is no reasonable approach that would allow the development in accordance with the Wetlands Ordinance. The Project provides an opportunity for the Applicant to develop a commercial building while also providing for partial cleanup of contaminants under a RAM Plan, restoring and enhancing RFA and BVW, and results in a net ecological improvement over existing conditions at the Williams parcel.

The Applicant understands that there is not a clear approach that avoids impacts to jurisdictional resource areas. However, the selected approach avoids and minimizes impacts to jurisdictional resource areas to the maximum extent practicable while also mitigating for proposed impacts. The proposed mitigation will improve the ecological quality of the on-site resource areas by restoring and enhancing their functions and services, thereby protecting the interests of the WPA and Wetland Ordinance. The Applicant is providing a permit application in accordance with the Wetlands Ordinance, Section H(1)c:

Table 7. Watertown Wetland Ordinance Compliance

Wetland Ordinance, Section III-Procedures, (H)(c)	Regulation	Compliance
1	Application for Permit and WPA Form 3.	WPA Form 3 is provided with this submittal.
2	Provide a U.S.G.S at 8.5 X 11	This is provided as Figure 1 in Appendix A.

3	Name and address of property owner, applicant and abutters are provided.	Found on WPA Form 3, and in Appendix C, respectively.
4	Description of alteration to flood storage capacity.	Flood storage capacity is not being altered. There is no 100-year floodplain present on the Williams parcel.
5	Maximum and minimum groundwater elevations.	Not applicable.
6	Soil characteristics in representative portions of the site.	To be determined as part of the RAM Plan sampling and Geotech survey.
7	Runoff calculations and stormwater calculations are provided.	Presented in Appendix F.
8	Methods to be used to stabilize and maintain embankments.	Civil design plans and mitigation plans in Appendix B illustrate these methods.
9	Siltation and erosion control plans to be implemented.	Civil design plans and mitigation plans in Appendix B illustrate these methods.
10	Discussion on effect of the project on aesthetics, historic values, archeological and educational values, agriculture, and recreation where relevant.	The aesthetics of the site will be improved as the site is currently degraded and has debris present. The project will be constructed in accordance with the RMUD. See Section 6. The other discussion items are not applicable.
11	Methods of avoiding the use of pesticides, herbicides, fertilizers, and de-icing chemicals.	Not Applicable.
12	Where required by the Commission, a fisheries and or wildlife habitat study of the area.	A wildlife habitat evaluation was completed. See Section 7.6.

9 SUMMARY

SWCA is submitting this NOI behalf of the Applicant for the construction of a two-story mixed-use building at Parcel 1236-2-0 located at 0 Arlington Street in Watertown, Massachusetts. The project meets the requirements of a redevelopment project under 310 CMR 10.58(5) for “abandoned dumping grounds,” and is being proposed in accordance with the Watertown RMUD zoning regulations. The Williams parcel has been heavily degraded with fill and debris associated with former uses at the property in the 1900’s. A part of this project work will be conducted in RFA with 22,059 sf in the 0-100 foot and 1,912 sf in the 100–200-foot RFA. Work will also include impacts to BVW (4,215 sf), with mitigation for these impacts being 6,390 sf along the southern side of the site. Buffer zone work will also be incurred with a total of 19,758 sf of work in this area, which will also be restored following site work.

The project proposes to develop a commercial building, which will allow the Applicant an opportunity to implement cleanup of contaminants of concern when encountered during construction. As such, we respectively request the Commission issue an Order of Condition under the WPA and the Wetlands Ordinance in accordance with a request for a variance to the 50-foot no build zone.

10 REFERENCES

- Engineering Alliance, Inc., Drainage Calculations and Stormwater Management Plan for the Mixed Use Building located at Arlington Street & Elm Street, Watertown, Massachusetts. March 12, 2021.
- FEMA. 1980. FEMA Flood Map Service Center. Available at <https://msc.fema.gov/portal/search?AddressQuery=new%20ludlow%20rd%2C%20granby%2C%20ma#searchresultsanchorCenter|SearchByAddress>. Accessed on February 26, 2021.
- MassDEP. 2006. Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands, 2006.
- MassGIS. 2009. Areas of Critical Environmental Concern. Available at <https://docs.digital.mass.gov/dataset/massgis-data-areas-critical-environmental-concern>. Accessed February 4, 2021.
- MassGIS. 2010. Outstanding Resource Waters. Available at <https://docs.digital.mass.gov/dataset/massgis-data-outstanding-resource-waters>. Accessed February 4, 2021.
- MassGIS. 2017. NHESP Priority Habitats of Rare Species. Available at <https://docs.digital.mass.gov/dataset/massgis-data-nhesp-priority-habitats-rare-species>. Accessed February 18, 2021.
- MassGIS. 2021. NHESP Certified Vernal Pools. Available at <https://docs.digital.mass.gov/dataset/massgis-data-nhesp-certified-vernal-pools>. Accessed on February 4, 2021.
- Smith, S.B., K.H. McPherson, J.M. Backer, B.J. Pierce, D.W. Podlesak, and S.R. McWilliams. 2007. Fruit quality and consumption by songbirds during autumn migration. *The Wilson Journal of Ornithology* 119(3):419-428.
- Vineyard Engineering & Environmental Services, Inc. Phase II Comprehensive Site Assessment Scope of Work Modification (Part 2), January 8, 2008a.
- Vineyard Engineering & Environmental Services, Inc., Draft II CSA and Response Action Outcome Statement, September 25, 2008b.
- Watertown Zoning Ordinance. Amended December 11, 2018.
- Watertown Wetland Ordinance. Revised December 2012.

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APPENDIX A

Figures



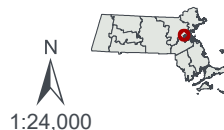
ARLINGTON STREET
WATERTOWN, MA
**Figure 1. USGS
Topographic Map**

 Parcel Boundary

Watertown, MA
USGS 7.5' Quadrange:
Newton, MA
71.1552°W 42.364°N

Base Map: ESRI ArcGIS Online,
accessed February 2021

Updated: 2/17/2021
Project No. 59467



1:24,000



SWCA
ENVIRONMENTAL CONSULTANTS



ARLINGTON STREET
WATERTOWN, MA
Figure 2. Aerial Map

Parcel Boundary

SWCA
ENVIRONMENTAL CONSULTANTS

Watertown, MA
USGS 7.5' Quadrangle:
Newton, MA
71.1552°W 42.364°N

Base Map: ESRI ArcGIS Online,
accessed February 2021

Updated: 2/17/2021
Project No. 59467

N
1:2,000



0 100 200 Feet
0 25 50 Meters



ARLINGTON STREET
WATERTOWN, MA

**Figure 3. 100-Year
Floodplain**

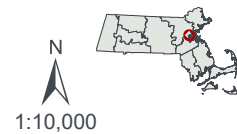
SWCA
ENVIRONMENTAL CONSULTANTS

 100-Year Floodplain
 Parcel Boundary

Watertown, MA
USGS 7.5' Quadrangle:
Newton, MA
71.1552°W 42.364°N

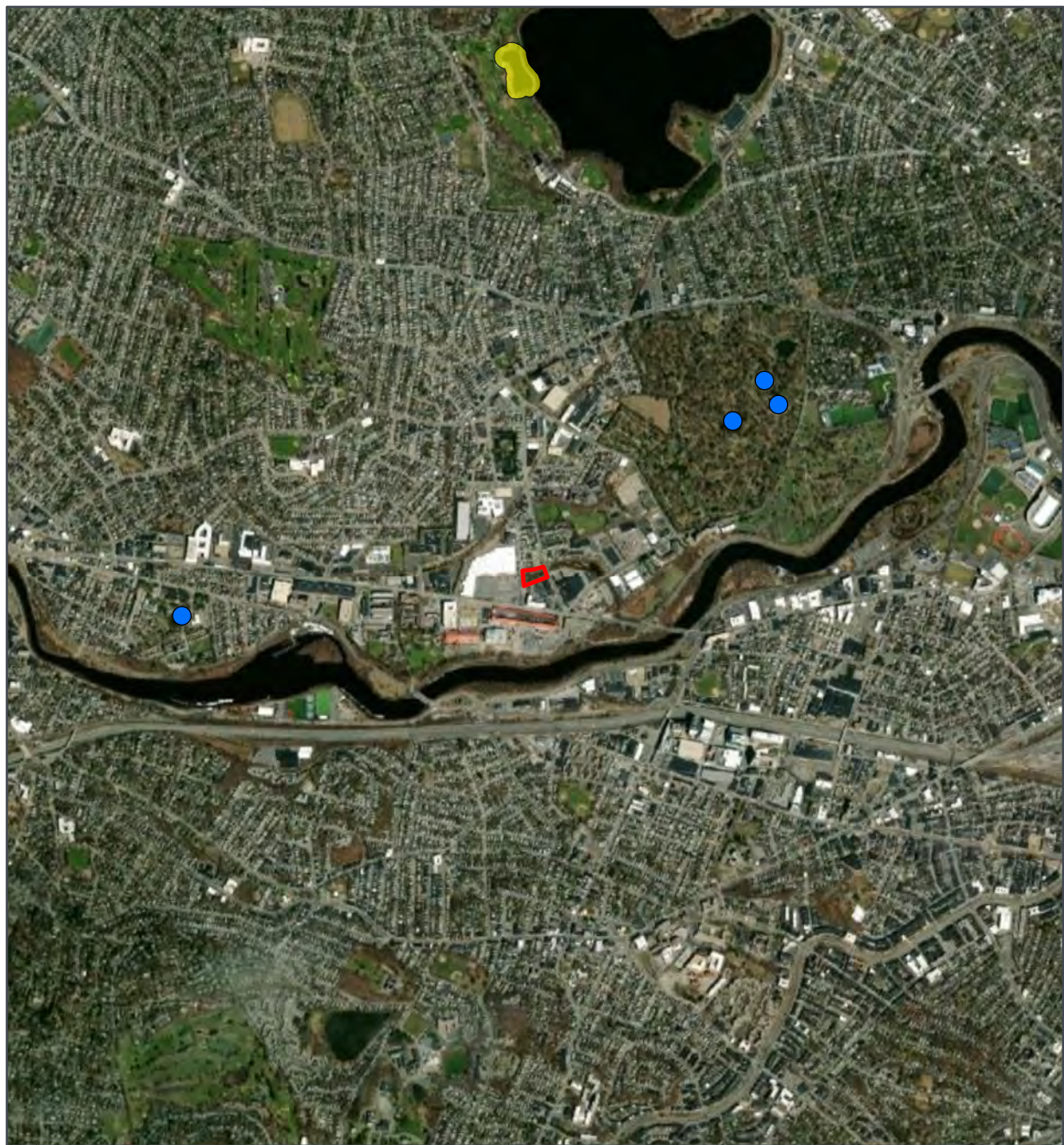
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accessed February 2021

Updated: 2/17/2021
Project No. 59467



1:10,000

0 400 800 Feet
0 100 200 Meters



ARLINGTON STREET
WATERTOWN, MA
Figure 4. NHESP

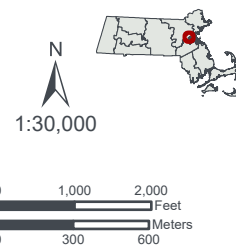
SWCA
ENVIRONMENTAL CONSULTANTS

- Potential Vernal Pool
- Priority Habitats of Rare Species
- Parcel Boundary

Watertown, MA
USGS 7.5' Quadrangle:
Newton, MA
71.1552°W 42.364°N

Base Map: ESRI ArcGIS Online,
accessed February 2021

Updated: 2/17/2021
Project No. 59467

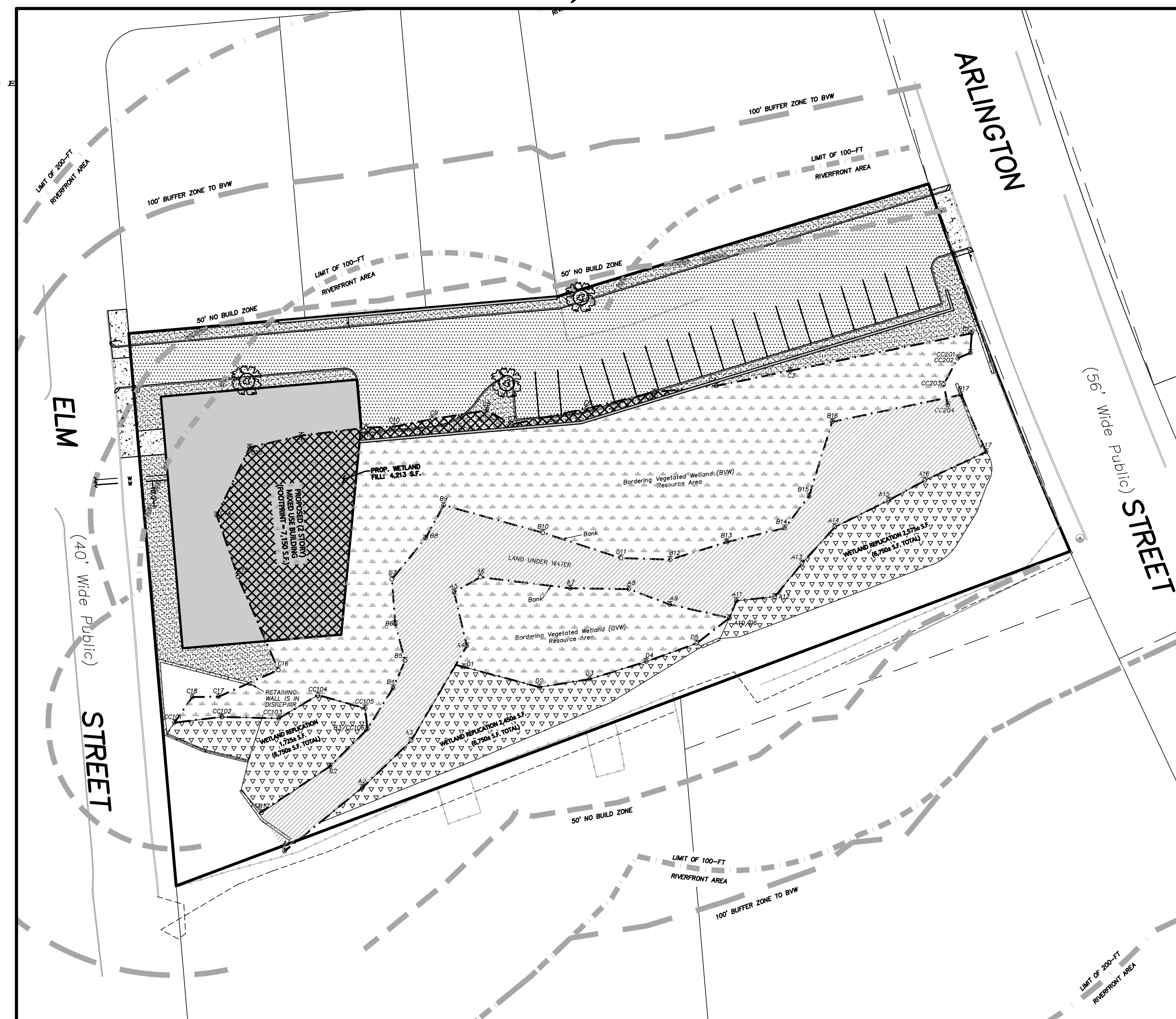
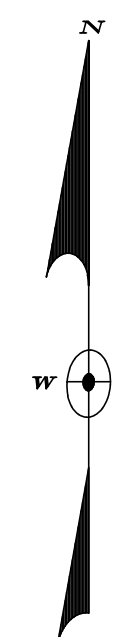


APPENDIX B

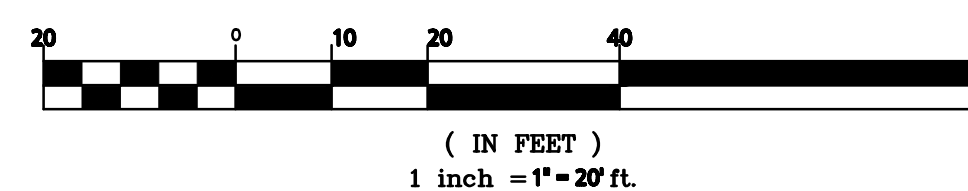
Proposed Mixed Use Building Plan Set and Mitigation Plans



SURVEYOR:
OTTE & DWYER, INC
LAND SURVEYORS
59 APPLETON STREET
SAUGUS, MA 01906
(781) 233-8155



KEY MAP
GRAPHIC SCALE



PREPARED BY:



Engineering Alliance, Inc.
Civil Engineering & Land Planning Consultants
194 Central Street
Saugus, MA 01906
Tel: (781) 231-1349
Fax: (781) 417-0020

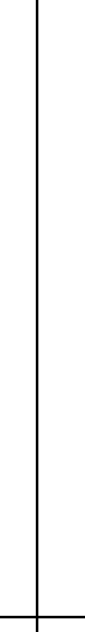
1950 Lafayette Road
Portsmouth, NH 03801
Tel: (603) 610-7100
Fax: (603) 610-7101

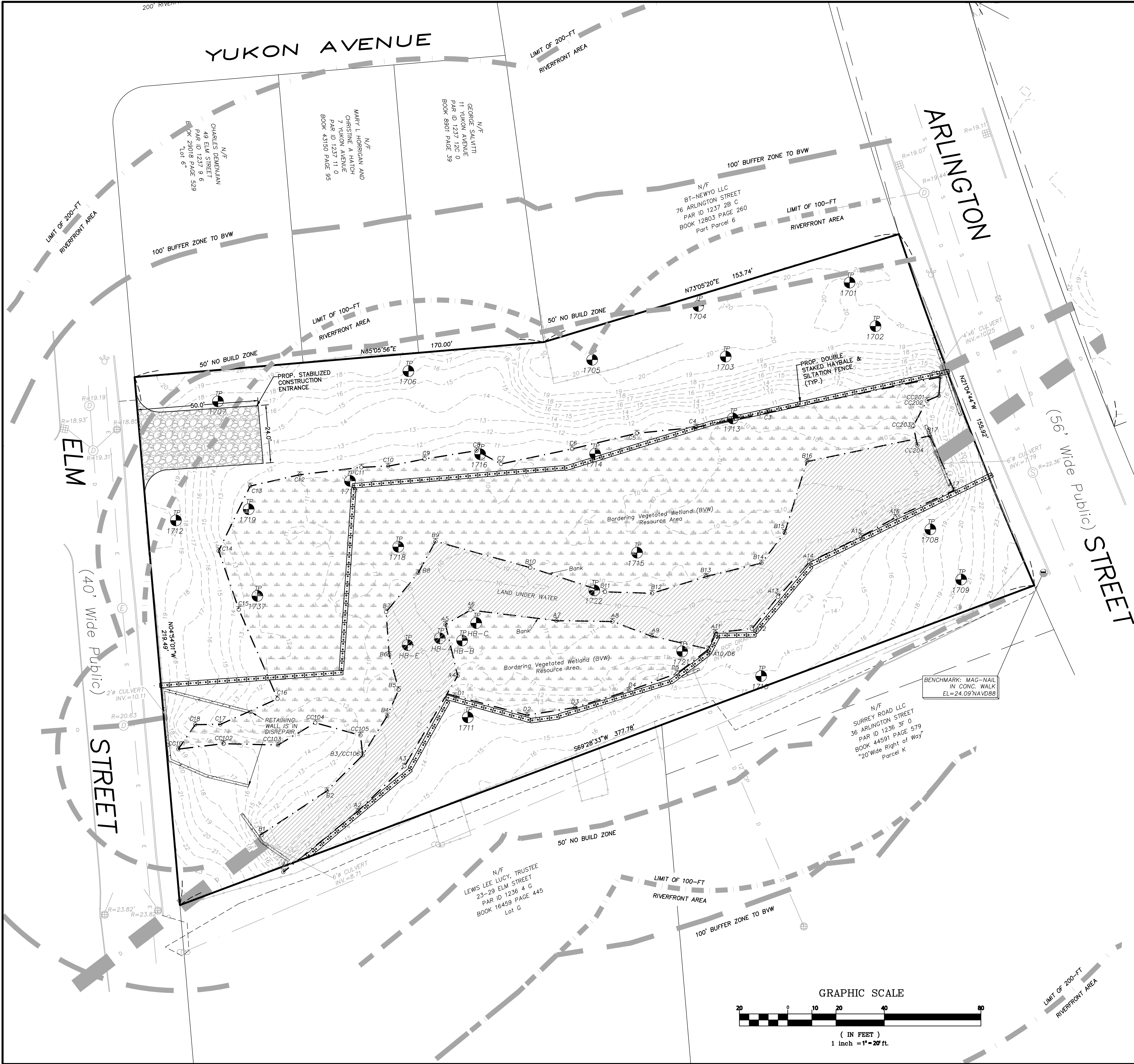
PREPARED FOR:

Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

SHEET NUMBER AND TITLE

- C-0 COVER SHEET
- C-1 EXISTING CONDITIONS
& EROSION CONTROL PLAN
- C-2 SITE LAYOUT PLAN
- C-3 GRADING , DRAINAGE & UTILITY PLAN
- D-1 DETAILS SHEET
- D-II DETAILS SHEET II
- L-1 RESOURCE AREA MITIGATION PLAN
- L-2 DETAILS

APPLICANT: Maximos Hatziliades 71 Arlington Street Watertown, MA 02472	DRAWING TITLE: Cover Sheet	DWG. NO.	C-0
		PROJECT:	
		Proposed Site Plan Arlington Street & Elm Street (Parcel ID: 1236 2 0) Watertown, Massachusetts	
		PROJECT #:	09-27801
		DATE:	March 12, 2021
		SCALE:	As Noted
		DWG FILE NAME:	060120.dwg
		DESIGN BY:	Calvin Reach
		CHECKED BY:	Richard A. Salvo, P.E.
		PREPARED BY:  Engineering Alliance, Inc. Civil Engineering & Land Planning Consultants 194 Central Street Saugus, MA 01906 Tel: (781) 231-1349 Fax: (781) 417-0020	
		DATE:	
		DESCRIPTION OF REVISION	



GENERAL NOTES

OWNER OF RECORD: MAXIMOS HATZILIADES
5 MADISON STREET BELMONT MA 02178
DEED REFERENCE: BOOK 1313 PAGE 46 PARCEL 2 ONLY
PLAN REFERENCE: PLAN 848 OF 1973 B OF 4 SOUTHERLY PORTION LOT 6
TAX MAP REFERENCE: PARCEL ID 1236 2 0

DATUM REFERENCE: NAVD 1988 (1' CONTOURS)
CONTOUR LINES GENERATED FROM MASS GIS LIDAR TERRAIN DATA DATED 2013-2014. ELEVATIONS HAVE BEEN FIELD CHECKED WITH GPS.

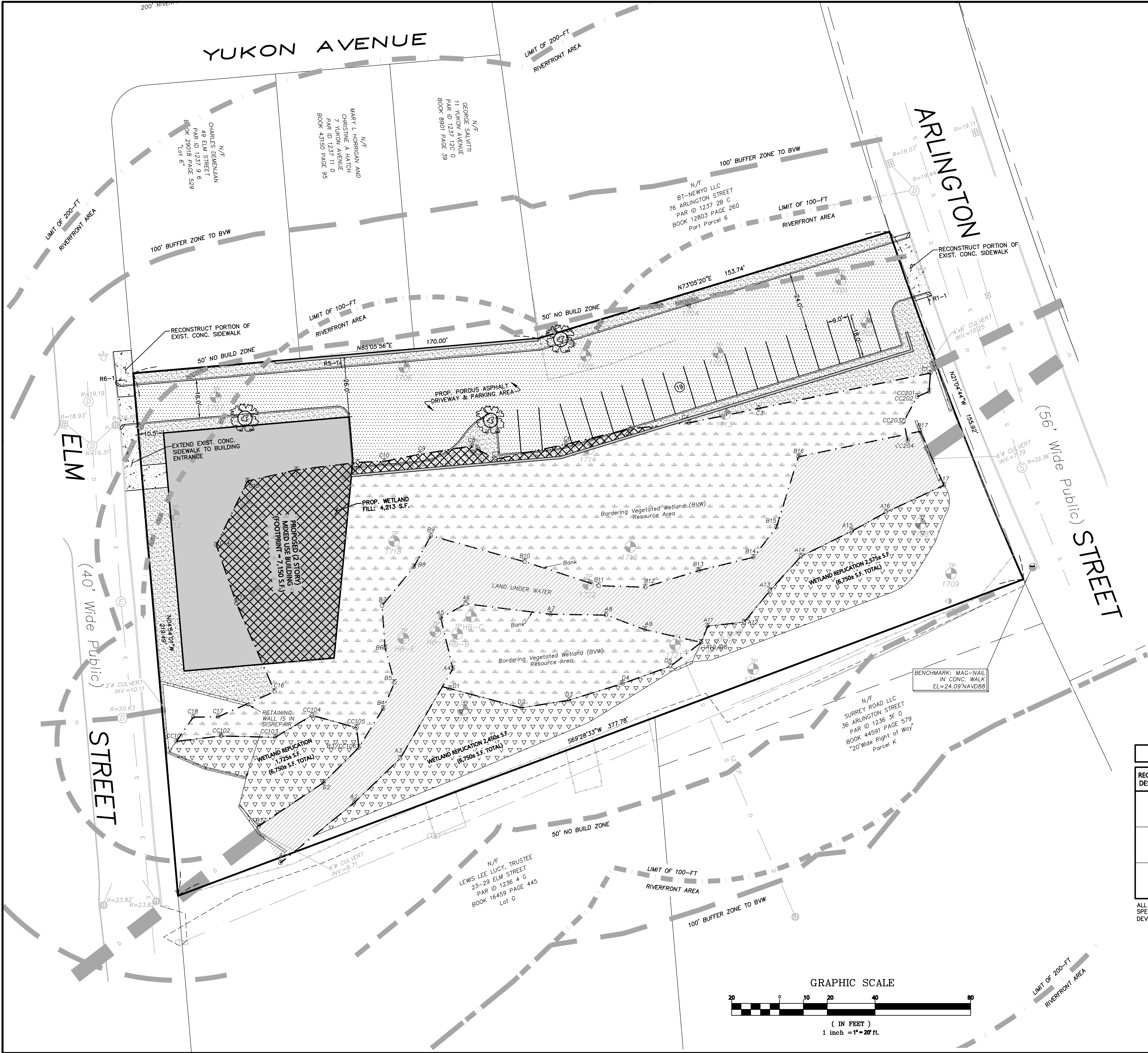
WETLAND FLAGGING BY SWCA APPROVED IN ORAD ISSUED UNDER DEP FILE NO. 321-0168 ON JULY 17, 2019.

ACCORDING TO THE F.E.M.A. MAP FOR MIDDLESEX COUNTY, MAP No. 25017C0557E, DATED JUNE 4, 2010, THE PARCEL(S) FALLS IN AN AREA CLASSIFIED AS ZONE "X" (OUTSIDE OF 0.2% CHANCE).

GENERAL UTILITY NOTE

ALL UTILITIES SHOWN ARE BY FIELD LOCATION AND/OR COMPILED ACCORDING TO AVAILABLE RECORD PLANS AND ARE APPROXIMATE ONLY. OTTE & DWYER, INC. AND ITS SURVEYOR ASSUME NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES. CALL 1-800-DIGSAFE

APPLICANT:		PROJECT:		PREPARED BY:	
Maximos Hatziliades 71 Arlington Street Watertown, MA 02472		Proposed Site Plan Arlington Street & Elm Street (Parcel ID: 1236 2 0) Watertown, Massachusetts		Engineering Alliance, Inc. Civil Engineering & Land Planning Consultants 194 Central Street Saugus, MA 01906 Tel: (781) 231-1349 Fax: (781) 417-0020	
DWG. NO. C-1		PROJECT # 09-27801 SCALE: As Noted DESIGN BY: Calvin Reach		DATE: March 12, 2021 DWG FILE NAME: 060120.dwg CHECKED BY: Richard A. Salvo, P.E.	
DRAWING TITLE: Existing Conditions & Erosion Control Plan		Professional Engineer for Engineering Alliance, Inc.		DESCRIPTION OF REVISION	



LAND USAGE TABLE			
Regional Mixed Use (RMUD)			
ITEM	REQUIRED	PROVIDED	VARIANCE/WAIVER REQUIRED
MINIMUM LOT SIZE	10,000 SF	61,721 ± SF	NO
MINIMUM LOT FRONTAGE	50 FT	156 FT	NO
MINIMUM FRONT YARD SETBACK	10 FT	10.5 FT	NO
MINIMUM SIDE YARD SETBACK	15 FT	26 FT	NO
MINIMUM REAR YARD SETBACK	20 FT	-	NO
MAXIMUM BUILDING COVERAGE	75 %	11.6%	NO
MAXIMUM IMPERVIOUS COVERAGE	85 %	29.6	NO
MAXIMUM HEIGHT (FT/STORIES)	55 FT / 5	35 FT / 2	NO
MINIMUM LOT AREA PER DWELLING UNIT	N/A	-	NO
MAXIMUM FAR	1.0	0.2	NO
MINIMUM OPEN SPACE	20 %	-	NO

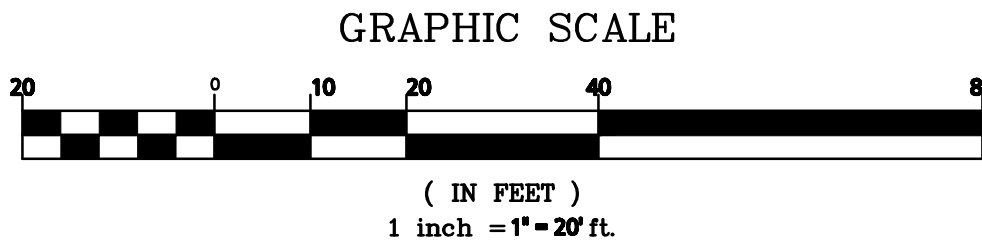
NOTES:
SIDE YARDS BETWEEN BUILDINGS WITHOUT DWELLING UNITS MAY BE OMITTED BY SPECIAL PERMIT PROVIDED THAT THE SIDE YARD DOES NOT ADJOURN RESIDENCE DISTRICT, AND THAT THE ACCESS OF EMERGENCY EQUIPMENT TO THE REAR PARKING IS NOT RENDERED INACCESSIBLE.
FOR ALL NEW CONSTRUCTION IN THE RMUD DISTRICT, THE MAXIMUM LENGTH OF A CONTIGUOUS BUILDING FACADE SHALL BE NO MORE THAN 150FT LONG OR UP TO 250FT LONG BY SPECIAL PERMIT IN KEEPING WITH ADOPTED DESIGN GUIDELINES.

LEGEND - SITE LAYOUT PLAN	
PROPERTY LINE	
PROPOSED STRIPING	
PROPOSED BUILDING	
PARKING COUNT	(11)
PROPOSED RETAINING WALL	
PROPOSED CURBING	
PROPOSED POROUS ASPHALT	
PROPOSED CONCRETE SIDEWALK	
PROPOSED LANDSCAPED AREA	
PROPOSED DIRECTIONAL ARROW	
PROPOSED SIGN	

COMPONENT	REQUIRED	PROPOSED
RETAIL	10 SPACES 1.0 space per 350 gsf 3,500/350 = 10 spaces	19 SPACES (STANDARD SPACES)
WAREHOUSE	9 SPACES 1.0 space per 1,200 gsf 10,800/1,200 = 9 spaces	
TOTAL	19 SPACES	19 SPACES

SIGN TABLE					
REGULATORY DESCRIPTION	SIGN	SIZE	MOUNTING HEIGHT (BASED TO BOTTOM OF SIGN)	DESCRIPTION	REFLECTORIZED
R1-1		24" x 24"	7'-0"	WHITE ON RED	YES
R5-1		24" x 24"	7'-0"	WHITE ON RED	YES
R6-1		12" x 36"	7'-0"	WHITE ON BLACK	YES

ALL SIGNS AND PAVEMENT MARKINGS TO BE INSTALLED SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)



PREPARED BY:

Engineering Alliance, Inc.
Civil Engineering & Land Planning Consultants
1950 Lafayette Road
Saugus, MA 01906
Tel: (781) 231-1349
Fax: (603) 6107100

PROJECT:

Proposed Site Plan
Arlington Street & Elm Street
(Parcel ID: 1236 2 0)
Watertown, Massachusetts

PROJECT #:

09-27801

DATE:

March 12, 2021

SCALE:

As Noted

DWG FILE NAME:

060120.dwg

DESIGN BY:

Calvin Read

CHECKED BY:

Richard A. Salvo, P.E.

APPLICANT:

Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

DWG. NO.:

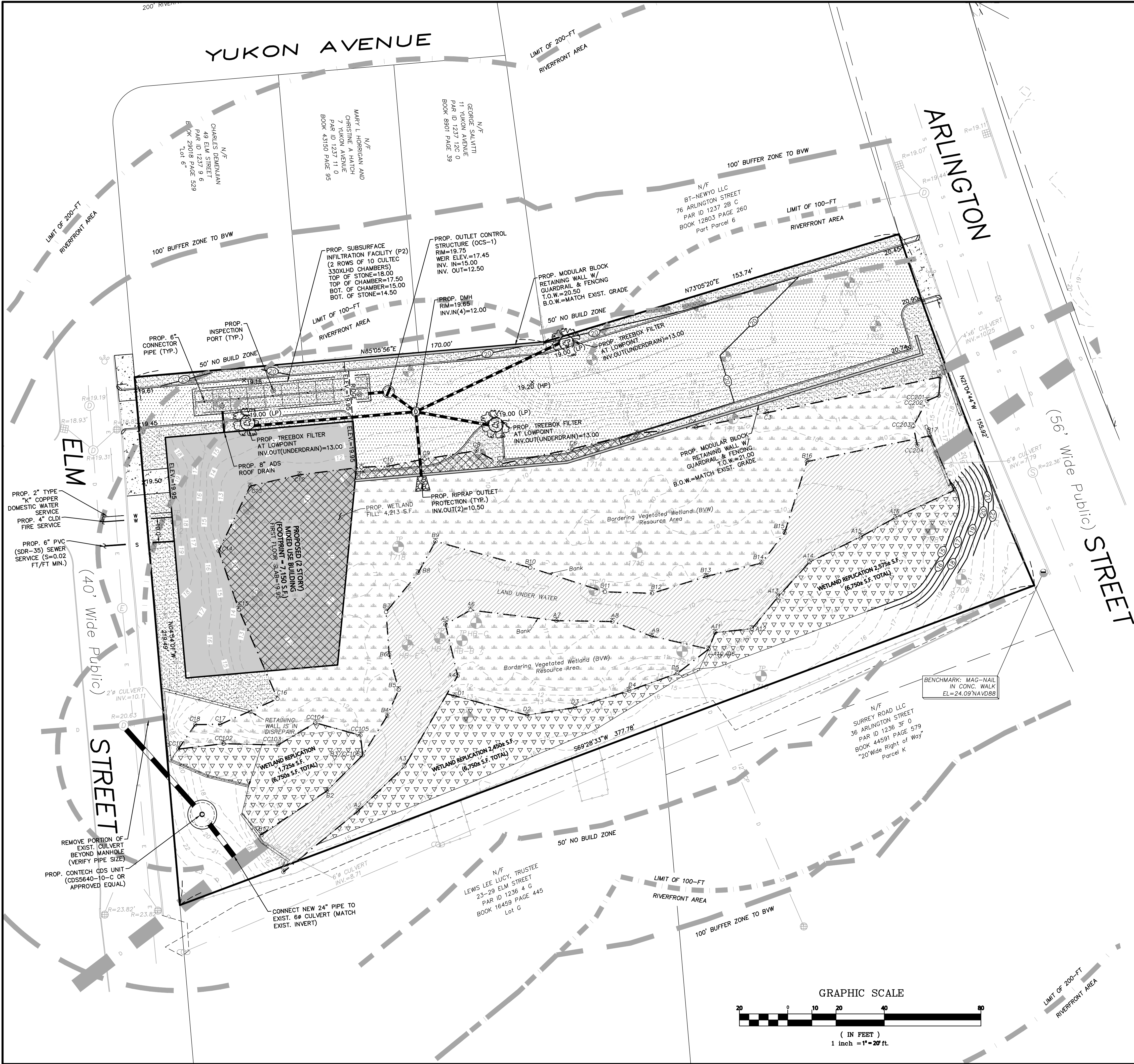
C-2

DRAWING TITLE:

Site Layout Plan

DESCRIPTION OF REVISION

DATE



LEGEND - GRADING, DRAINAGE, & UTILITY

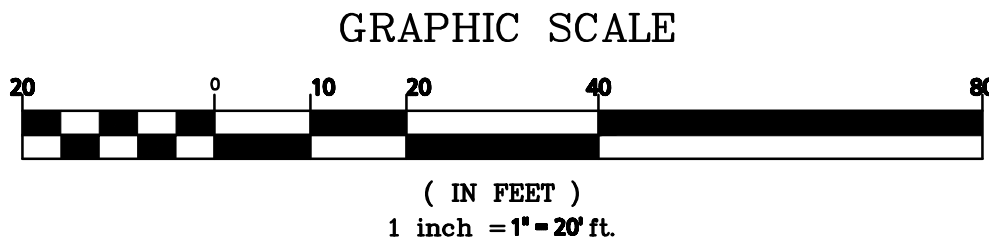
PROPERTY LINE	---
PROPOSED BUILDING	▒
PROPOSED DRAIN LINE	▬▬▬▬▬▬
PROPOSED SEWER LINE	— S —
PROPOSED WATER LINE	— W —
PROPOSED CONTOUR	— 22 —
PROPOSED SPOT SHOT	20.45X

GENERAL UTILITY NOTES:

- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES AND THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE WORK.
- THE CONTRACTOR SHALL EXCAVATE TEST PITS PRIOR TO COMMENCING WORK TO DETERMINE THE EXACT LOCATION OF WATER AND GAS SERVICES.
- ALL PROPOSED WORK SHALL BE PERFORMED IN FULL COMPLIANCE WITH THE TOWN OF WATERTOWN, AND IS SUBJECT TO QUALITY CONTROL TESTING AT THE DISCRETION OF THE ENGINEERING DEPT. AT THE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY THE TOWN OF WATERTOWN D.P.W. PRIOR TO THE COMMENCEMENT OF ANY UTILITY WORK.
- ALL UTILITY WORK WITHIN ANY RIGHT-OF-WAY SHALL BE PERFORMED BY A CONTRACTOR LICENSED BY THE DPW & OBTAIN A PERMIT FOR SUCH WORK FROM THE DPW.
- ANY CHANGE IN THE FIELD CONDITIONS SHOULD BE REPORTED TO THE ENGINEER TO ENSURE THAT ANY MODIFICATIONS TO THE ORIGINAL DESIGN CONFORM TO STANDARD ENGINEERING AND CONSTRUCTION PRACTICES AND ADEQUATE TO SERVE THE PROJECT'S NEEDS AND COMPLY WITH APPLICABLE STANDARDS AND REGULATIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ALL UTILITIES AS SHOWN ON THESE PLANS IN ACCORDANCE WITH THE APPROPRIATE UTILITY COMPANY SPECIFICATIONS. ALL UTILITY CONSTRUCTION SHALL CONFORM TO THE APPROPRIATE UTILITY COMPANY STANDARDS FOR CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING SPECIFICATIONS OF MATERIALS AND INSTALLATION PROCEDURES AND INSTALL IN ACCORDANCE WITH THESE REGULATIONS.
- THE CONTRACTOR IS RESPONSIBLE TO CONTACT AND DETERMINE, COORDINATE AND SCHEDULE ALL NECESSARY INSPECTIONS AND MONITORING WITH ALL APPROPRIATE UTILITY COMPANIES.
- THE CONTRACTOR OR OWNER IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ANY PERMITS AND/OR CONNECTION FEES REQUIRED TO PERFORM THE WORK.
- DISPOSAL OF ALL MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL MUNICIPAL REQUIREMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE RESTORATION AND CLEAN UP UPON COMPLETION OF THE PROJECT & SHALL SUBMIT AN AUTOCAD "AS-BUILT" TO THE ENGINEERING DEPT. UPON COMPLETION OF THE BUILDING & UTILITY WORK.

DRAINAGE NOTES:

- ALL STORM DRAINAGE PIPES SHALL BE 12" HIGH DENSITY POLYETHYLENE PIPE (H.D.P.E) CORRUGATED OUTSIDE & SMOOTH INSIDE UNLESS NOTED OTHERWISE.
- A MINIMUM OF 18" VERTICAL CLEARANCE SHALL BE MAINTAINED WHERE WATER SERVICES CROSS STORM DRAIN LINES. WATER SERVICES SHALL BE ENCASED IN CONCRETE REGARDLESS OF CLEARANCE WHEN PASSING BELOW STORM DRAIN LINES. ENCASEMENT SHALL EXTEND ALONG WATER SERVICE A MINIMUM DISTANCE OF 10' FROM THE CROSSING POINT OF THE OTHER PIPE AS MEASURED NORMALLY FROM ALL POINTS ALONG THE PIPE.
- REFER TO ARCHITECTURAL DRAWINGS FOR ALL SERVICE CONNECTIONS (I.E., ROOF DRAINS, WATER AND SEWER SERVICES, ETC.) WITHIN 10'-FT OF THE BUILDING WALLS.



APPLICANT:
Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

DWG. NO.
C-3

PROJECT:
**Proposed Site Plan
Arlington Street & Elm Street
(Parcel ID: 1236 2 0)
Watertown, Massachusetts**

DESIGN BY: Calvin Reach

PREPARED BY:
Engineering Alliance, Inc.
Civil Engineering & Land Planning Consultants
194 Central Street
Saugus, MA 01906
Tel: (781) 231-1349
Fax: (603) 417-0020

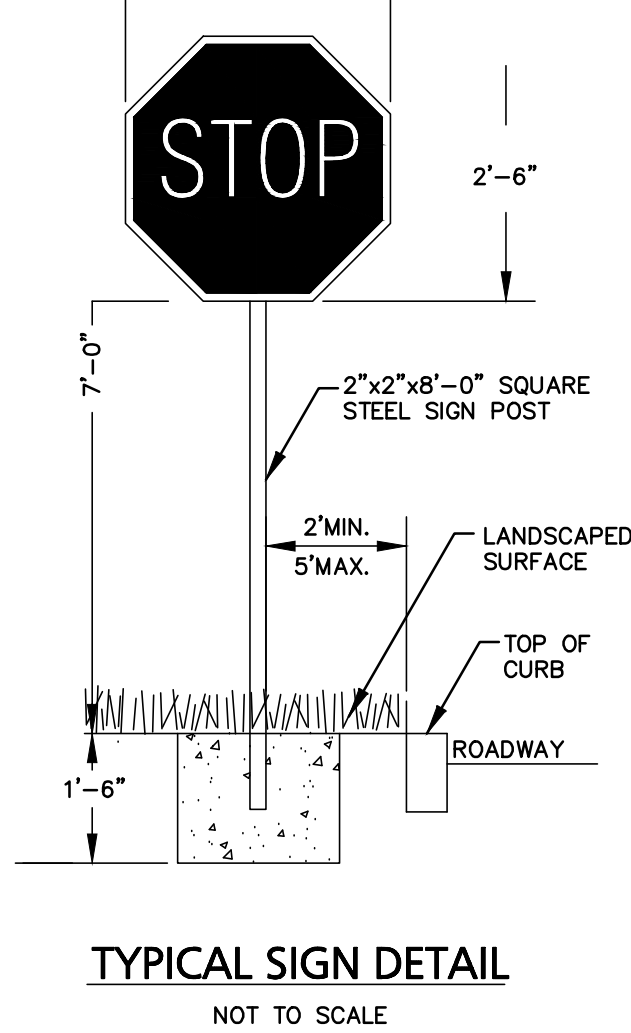
DATE: March 12, 2021
DWG FILE NAME: 060120.dwg
CHECKED BY: Richard A. Salvo, P.E.

DRAWING TITLE:
**Grading, Drainage
& Utility Plan**

Professional Engineer for
Engineering Alliance, Inc.

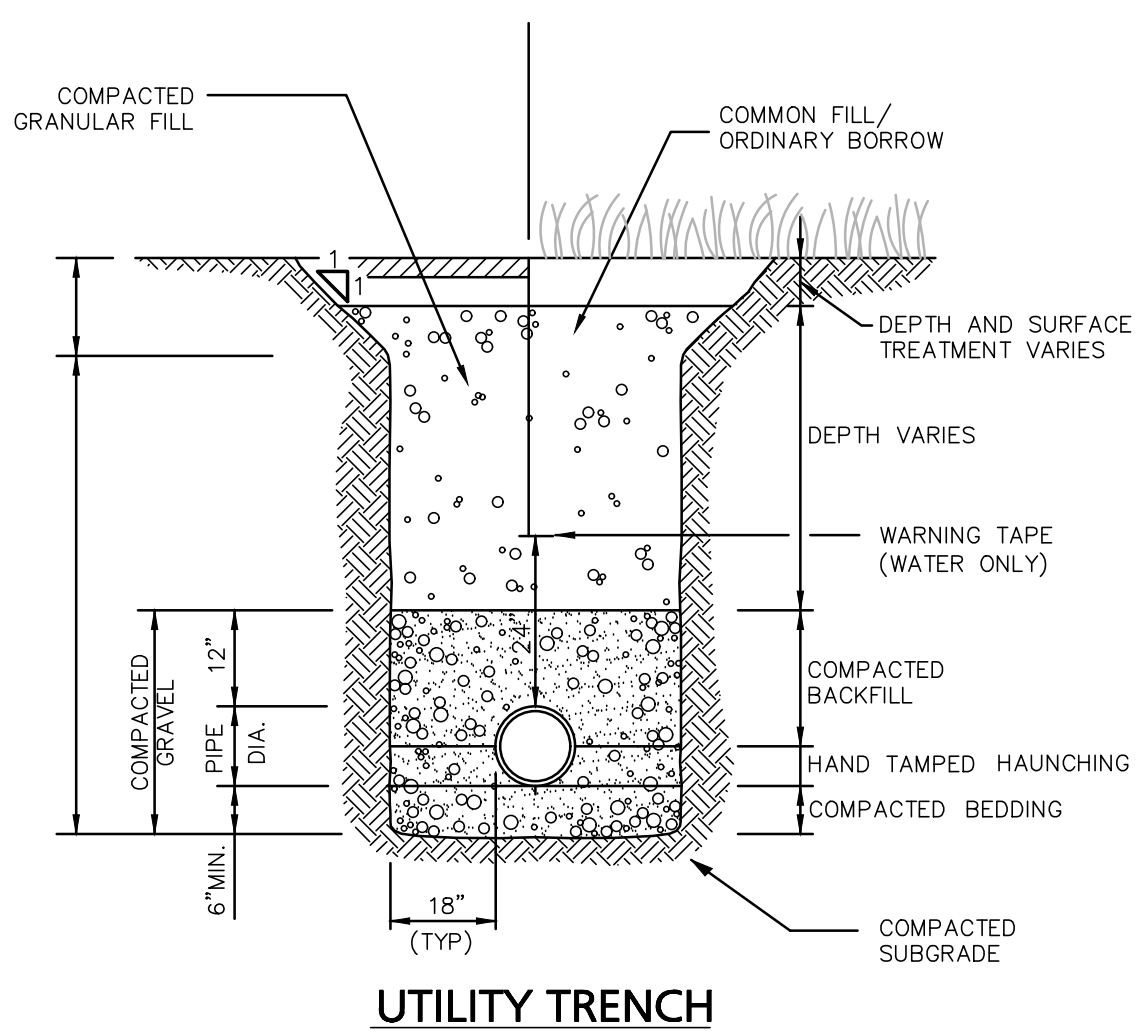
DESCRIPTION OF REVISION

DATE



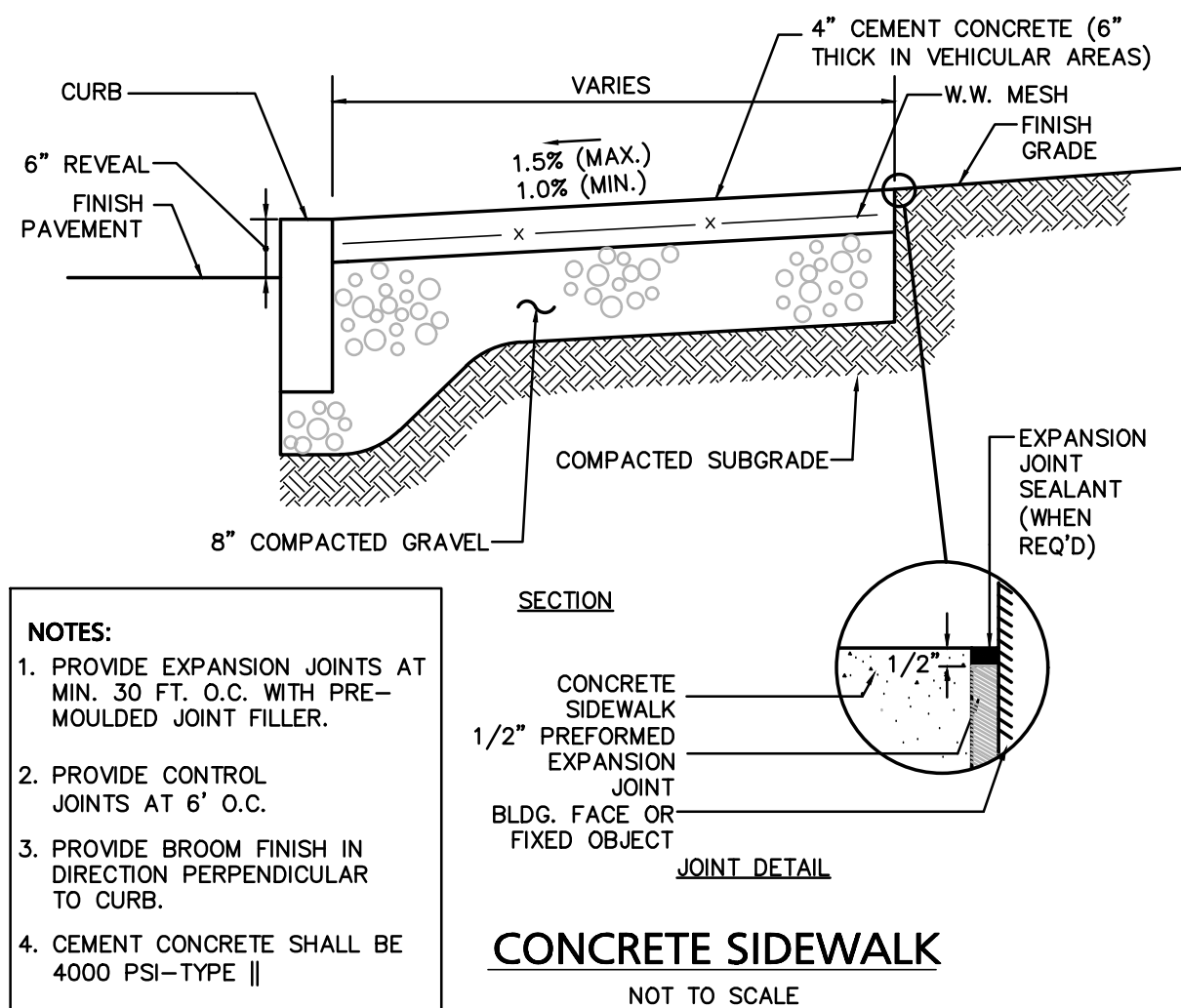
TYPICAL SIGN DETAIL

NOT TO SCALE



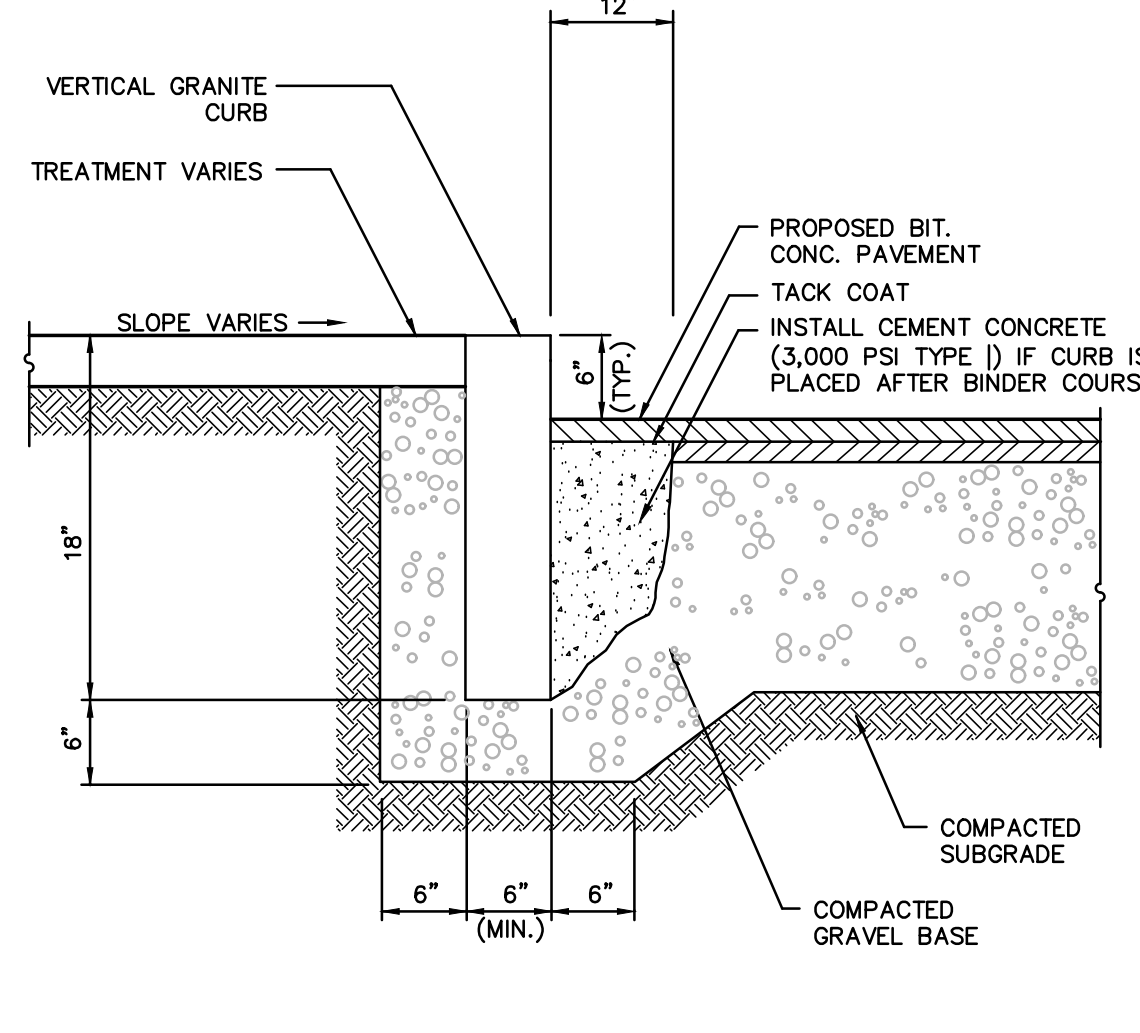
UTILITY TRENCH

NOT TO SCALE



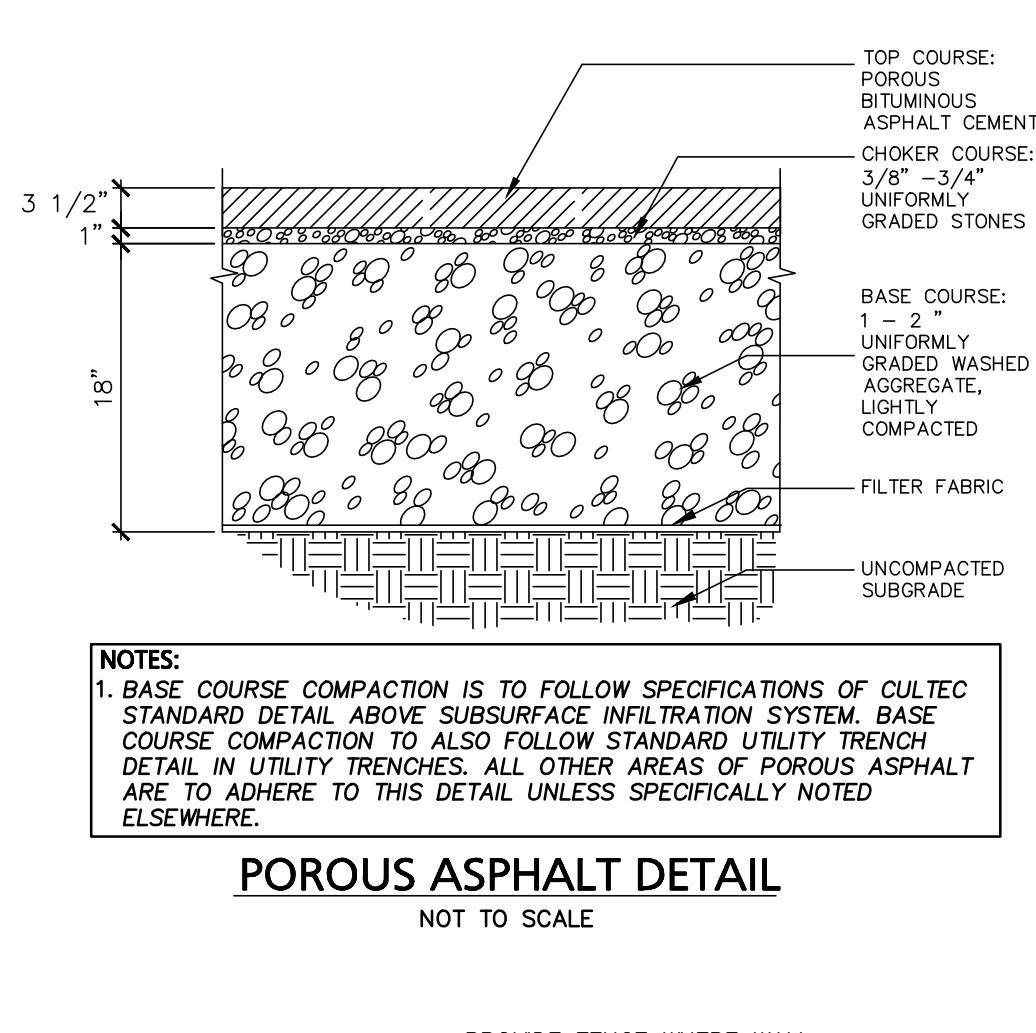
CONCRETE SIDEWALK

NOT TO SCALE



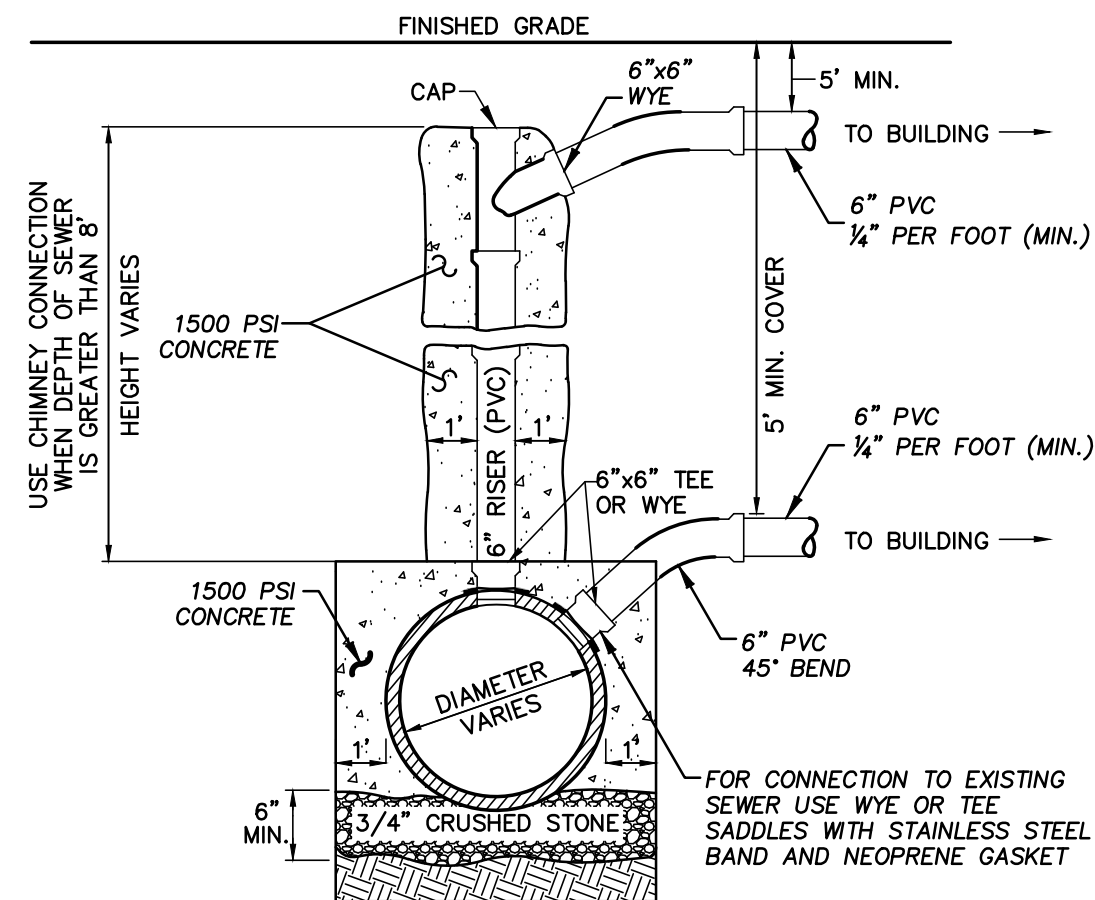
VERTICAL GRANITE CURB

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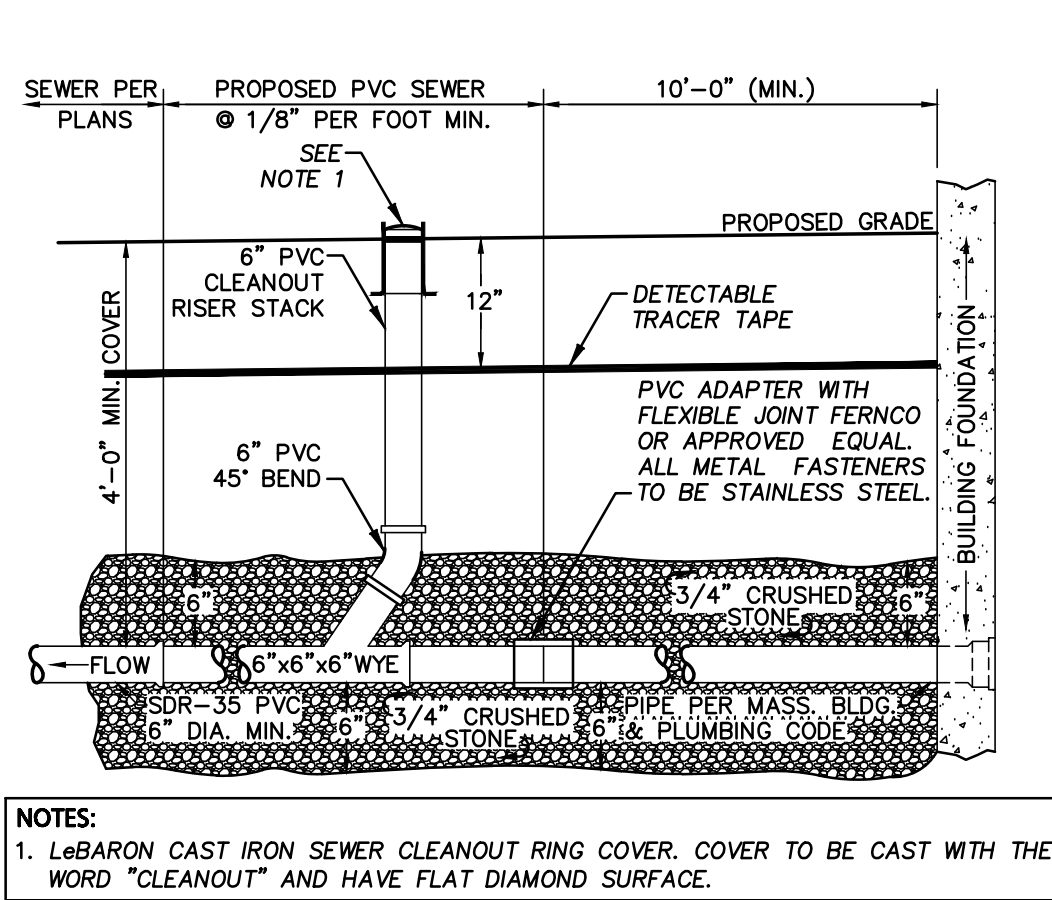
POROUS ASPHALT DETAIL

NOT TO SCALE



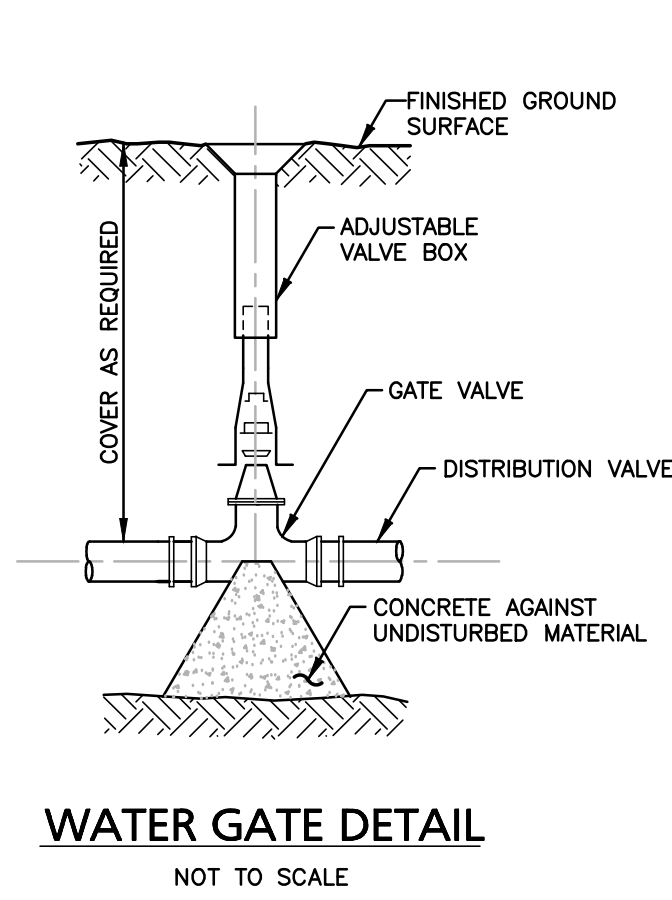
SANITARY SEWER SERVICE AT MAIN

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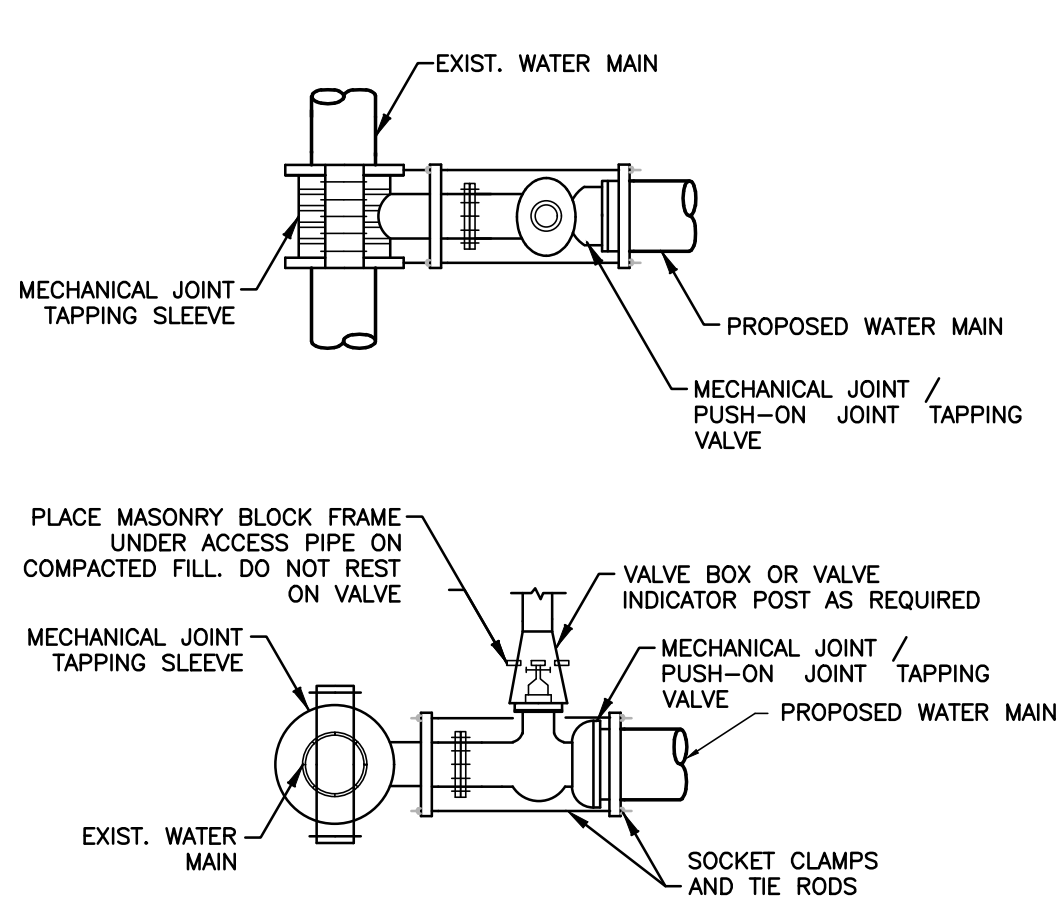
SANITARY SEWER SERVICE AT BUILDING

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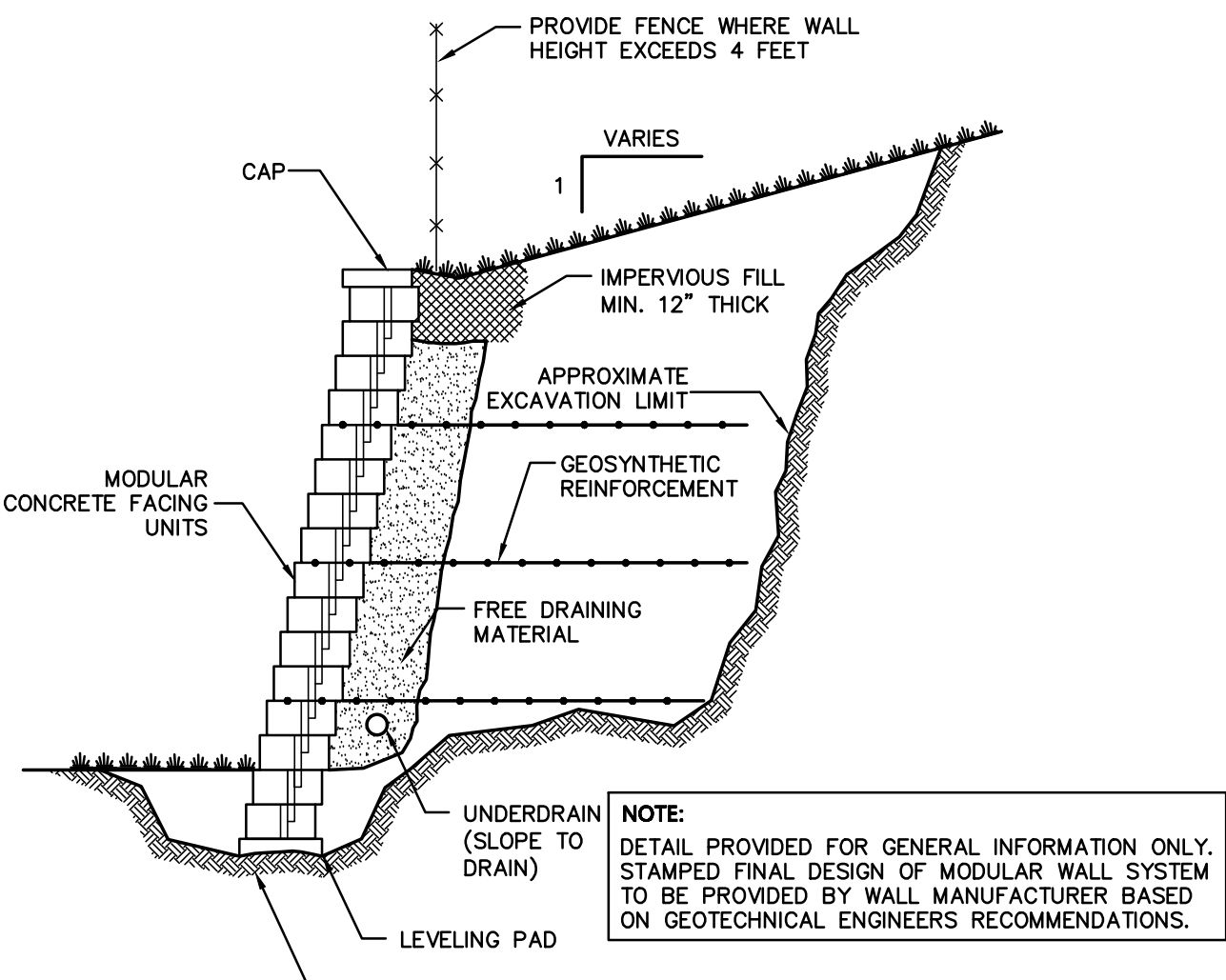
WATER GATE DETAIL

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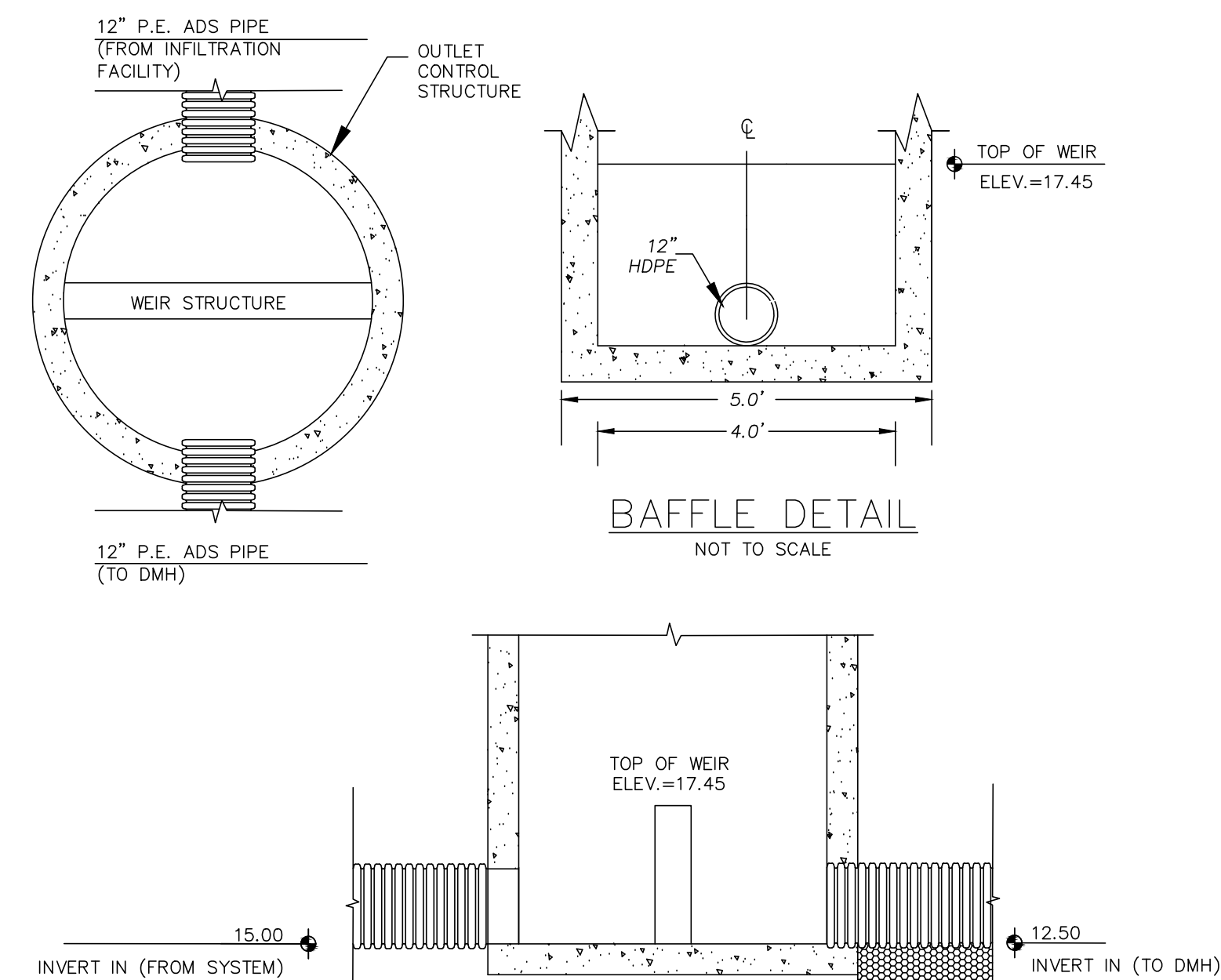
TAPPING SLEEVE AND VALVE

NOT TO SCALE



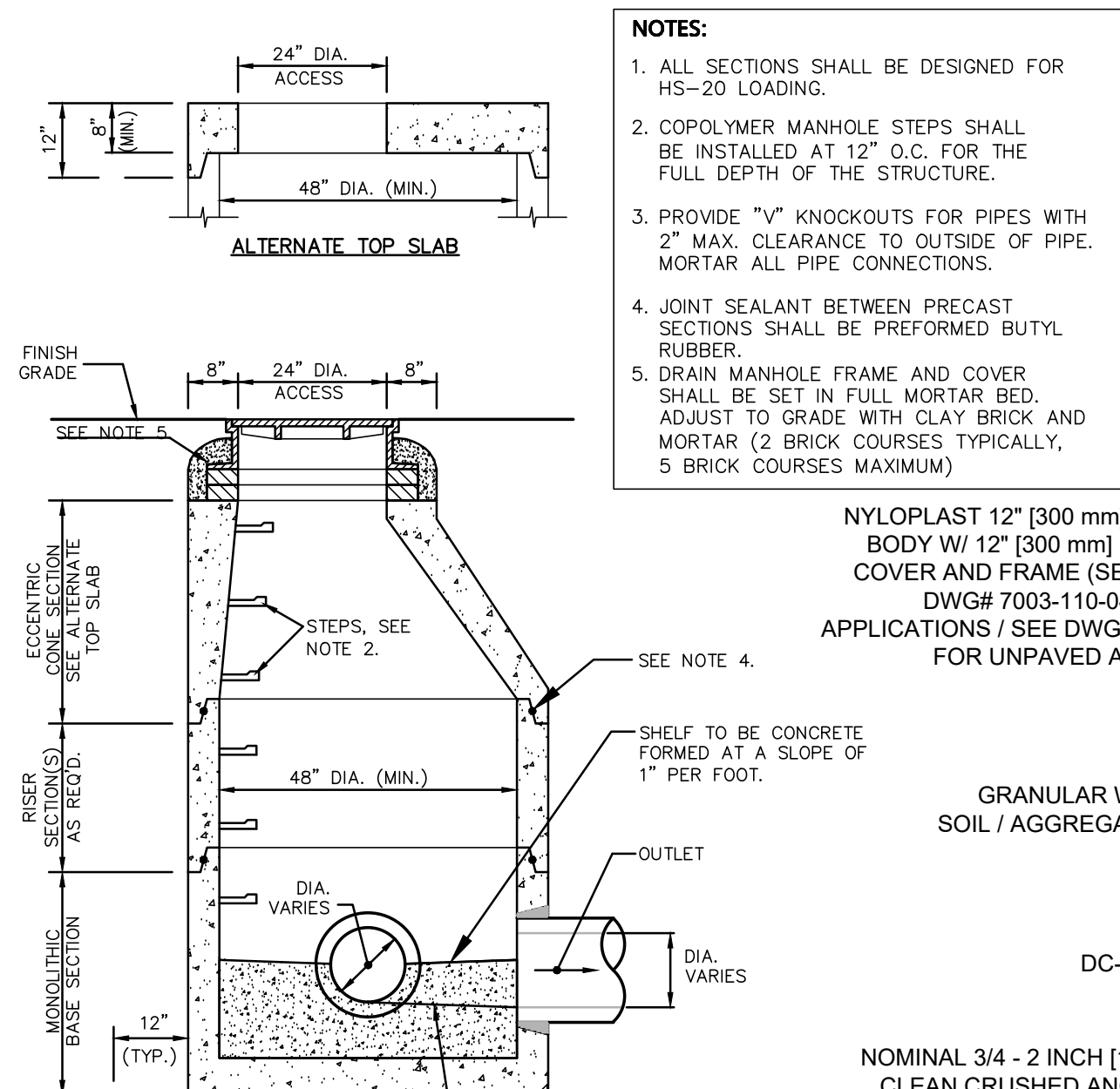
MODULAR RETAINING WALL

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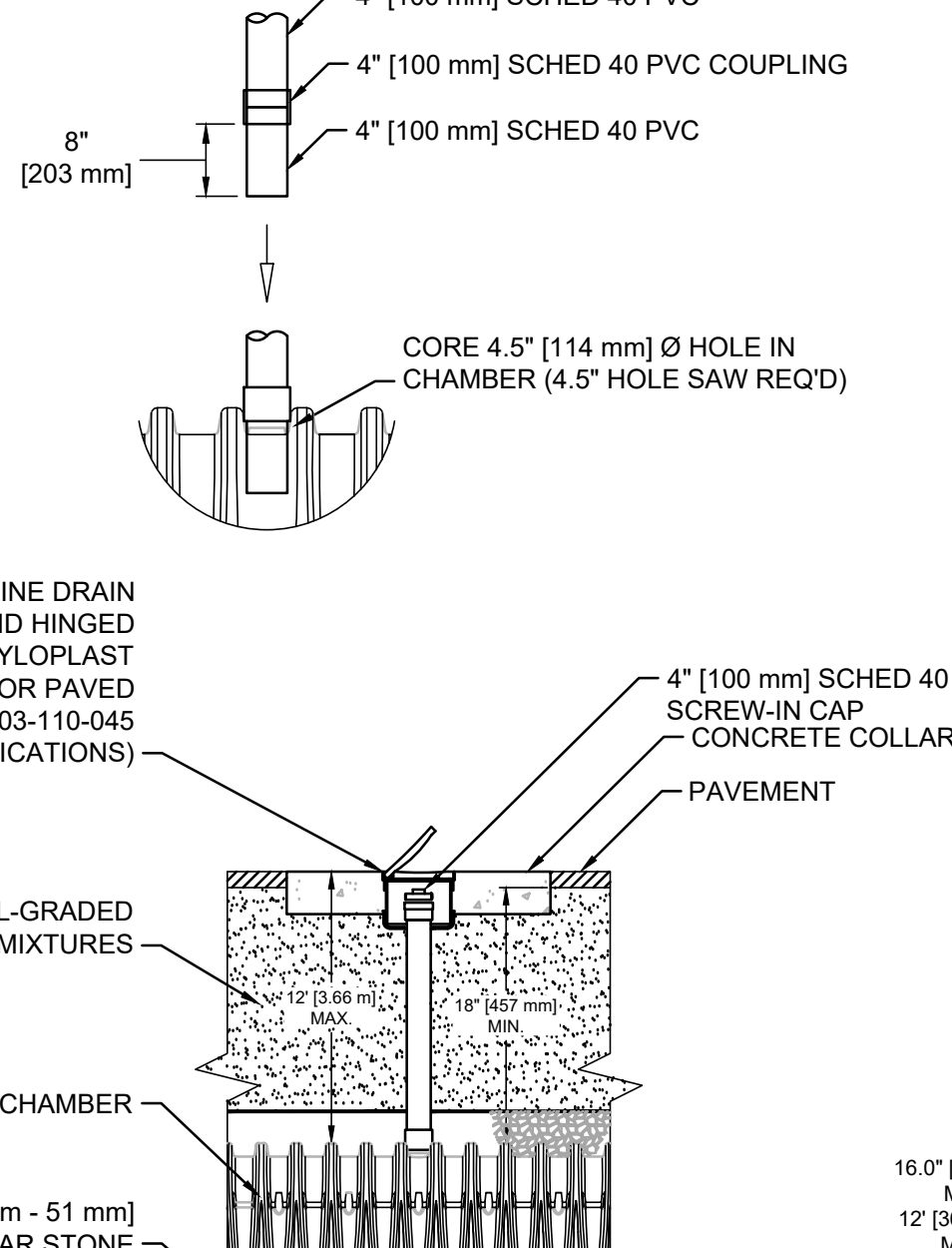
SUBSURFACE FACILITY OUTLET STRUCTURE DETAIL

NOT TO SCALE



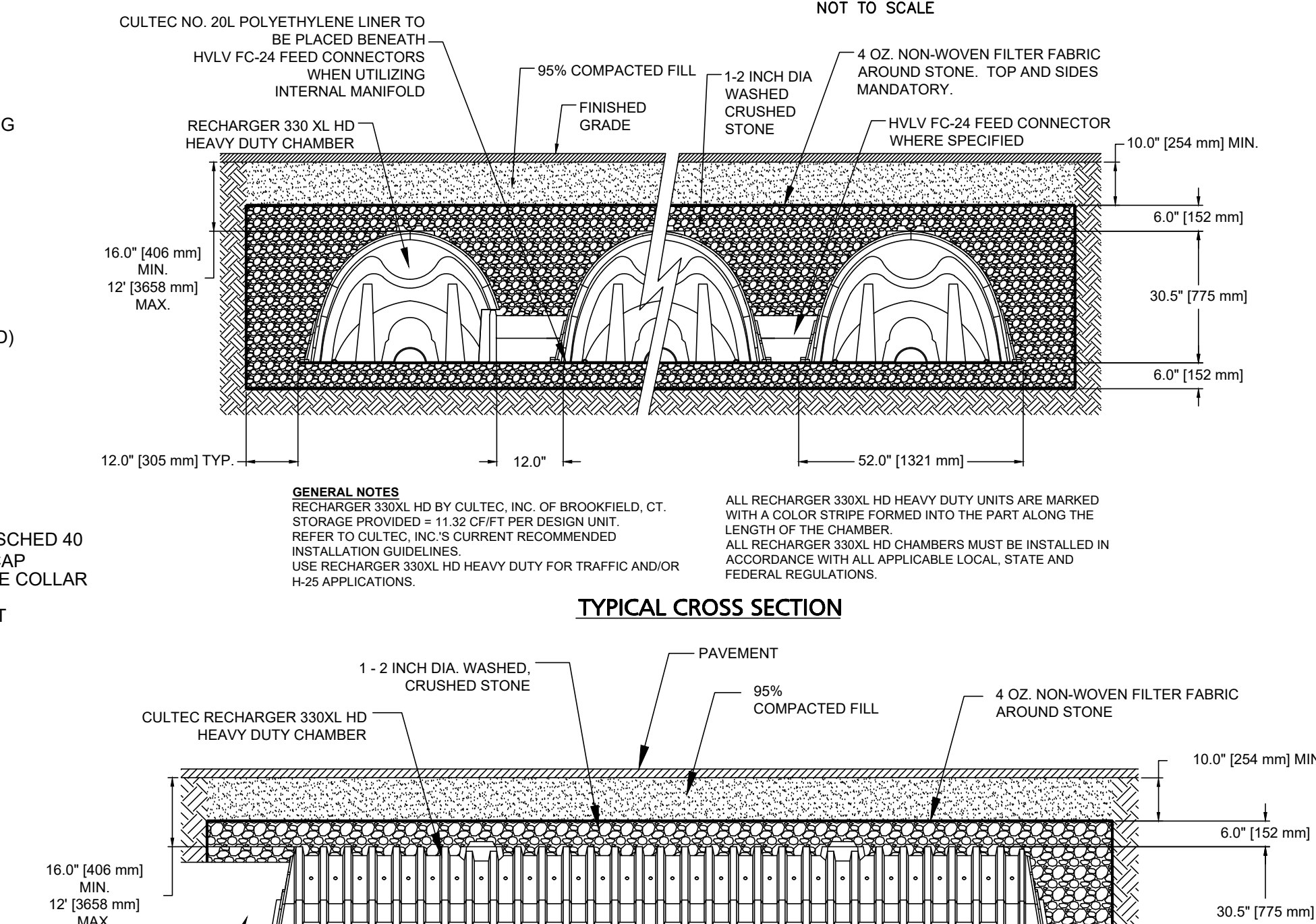
TYPICAL DRAIN MANHOLE

NOT TO SCALE



INSPECTION PORT DETAIL

NOT TO SCALE



MAINFOLD DETAIL

SUB-SURFACE DRAINAGE FACILITY DETAIL

CULTEC 330XL HD

NOT TO SCALE

PREPARED BY:

Engineering Alliance, Inc.
Civil Engineering & Land Planning Consultants
194 Central Street
Saugus, MA 01906
Tel: (781) 231-1349
Fax: (603) 6107101

PROJECT: Proposed Site Plan
Arlington Street & Elm Street
(Parcel ID: 1236 2 0)
Watertown, Massachusetts

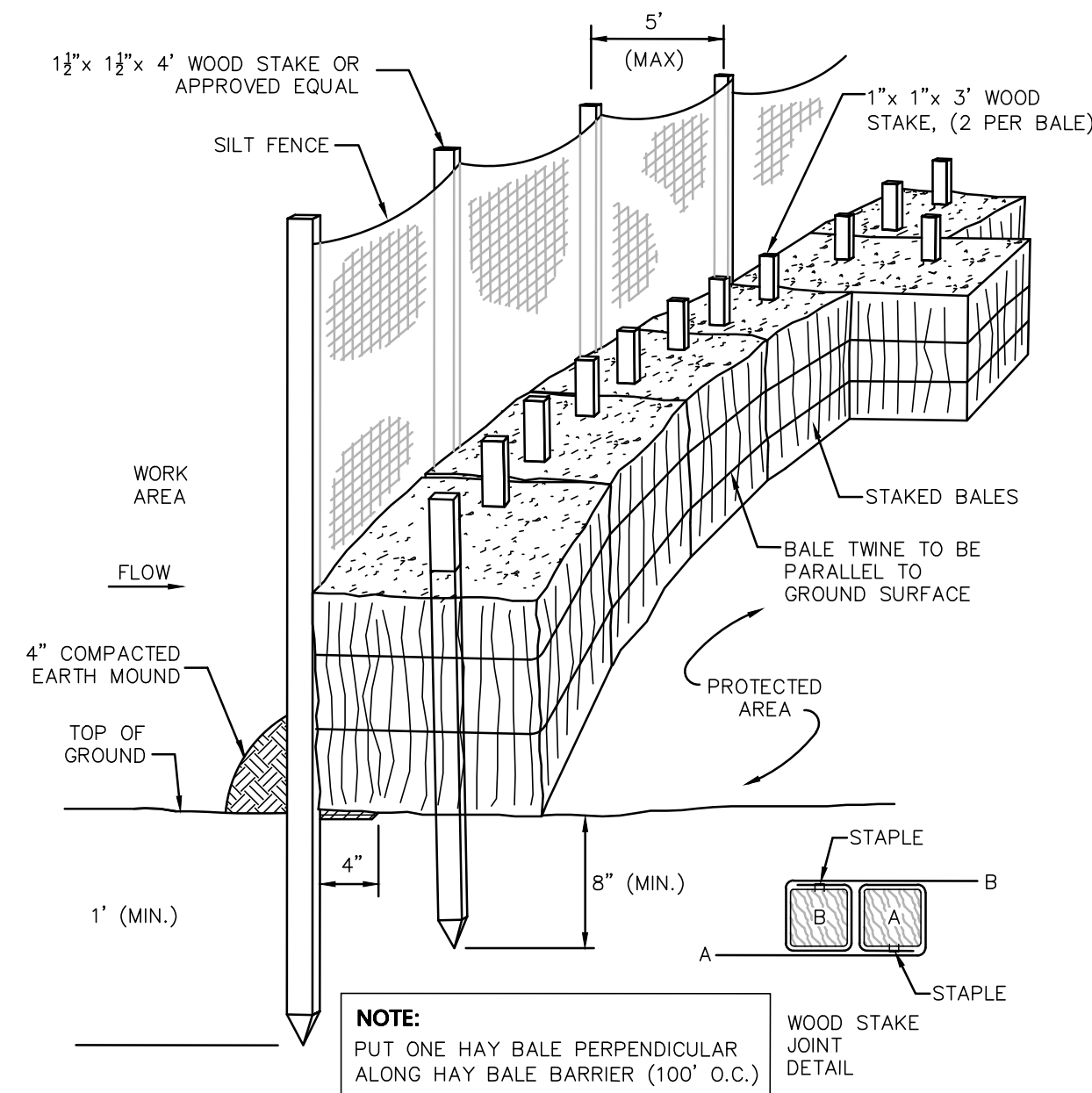
DATE: March 12, 2021
DWG FILE NAME: 060120.dwg
SCALE: As Noted
DESIGN BY: Calvin Reach

Professional Engineer for
Engineering Alliance, Inc.

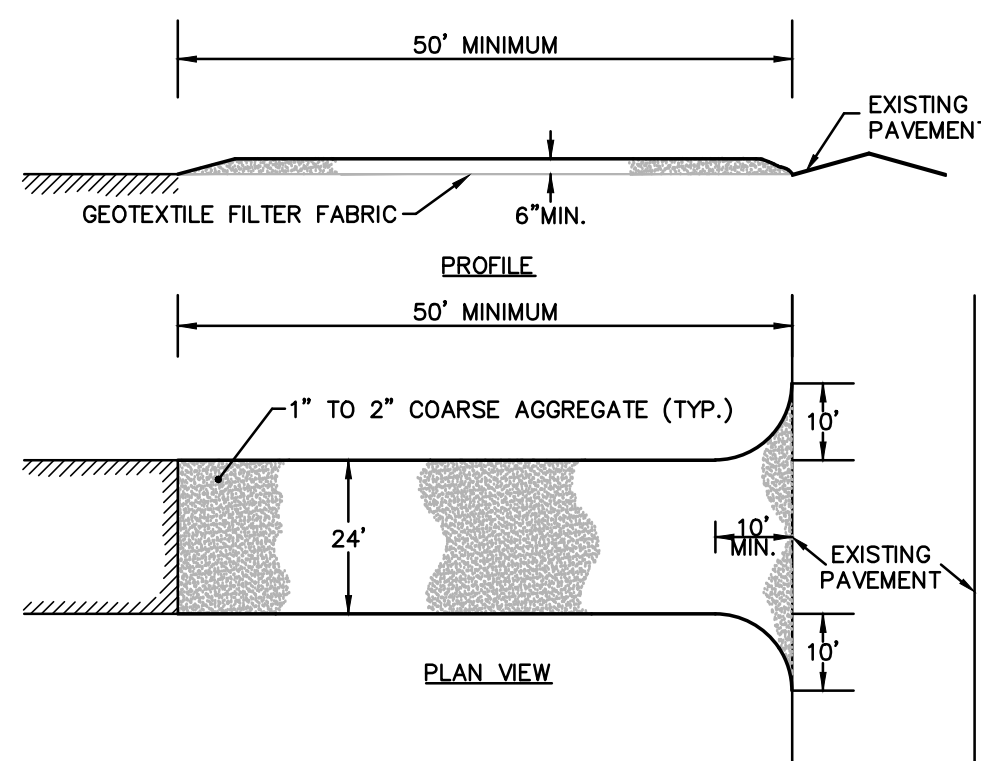
Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

DRAWING TITLE:
D-1
Details Sheet

DWG. NO.
D-1

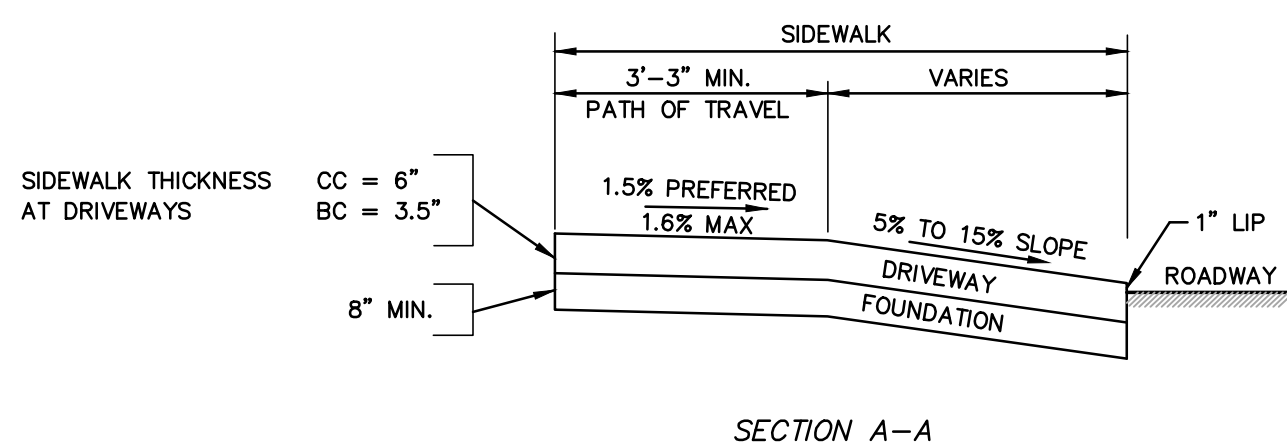


SILT FENCE / HAYBALE BARRIER
NOT TO SCALE

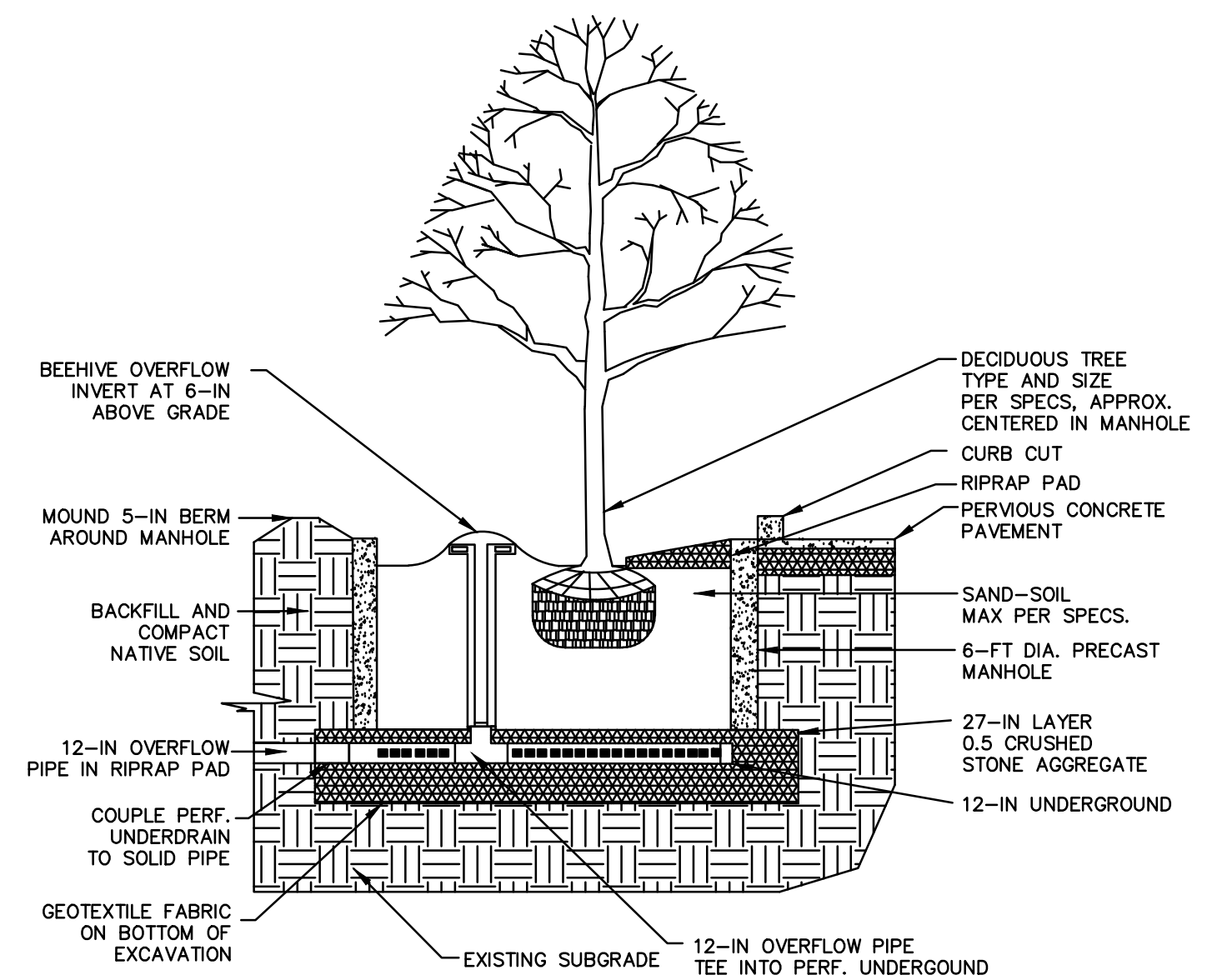
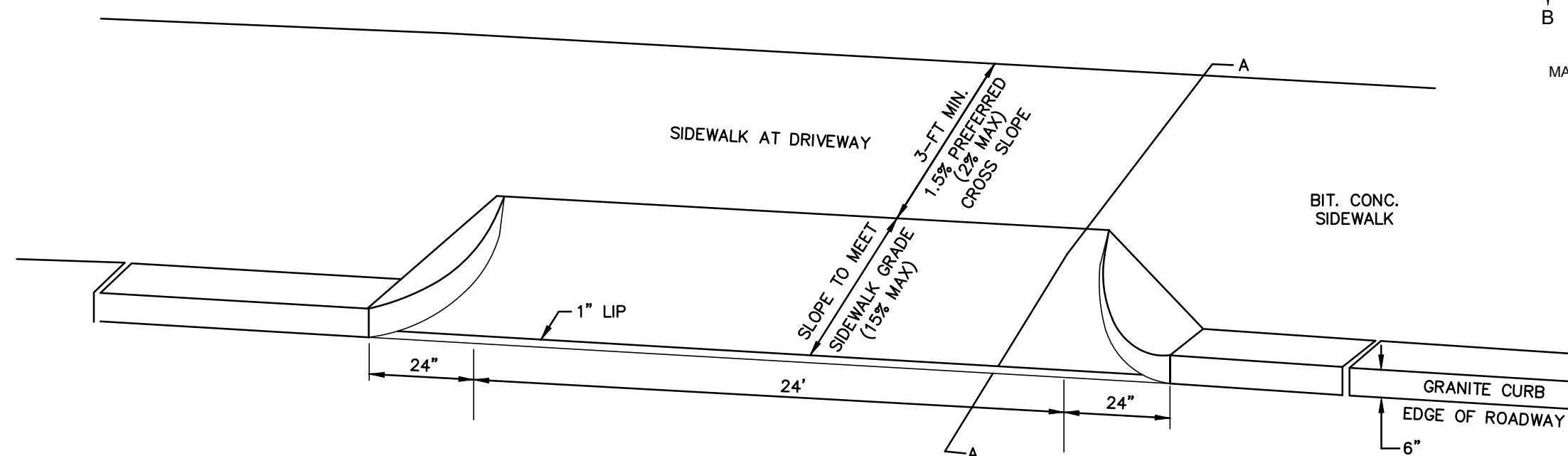


- CONSTRUCTION SPECIFICATIONS:**
1. STONE FOR A STABILIZATION CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
 2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT A 30 FOOT MINIMUM LENGTH WOULD APPLY.
 3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
 4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN A FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
 5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
 6. ALL SURFACE WATER THAT IS FLOWING TO OR DEVERTED TOWARDS THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
 7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

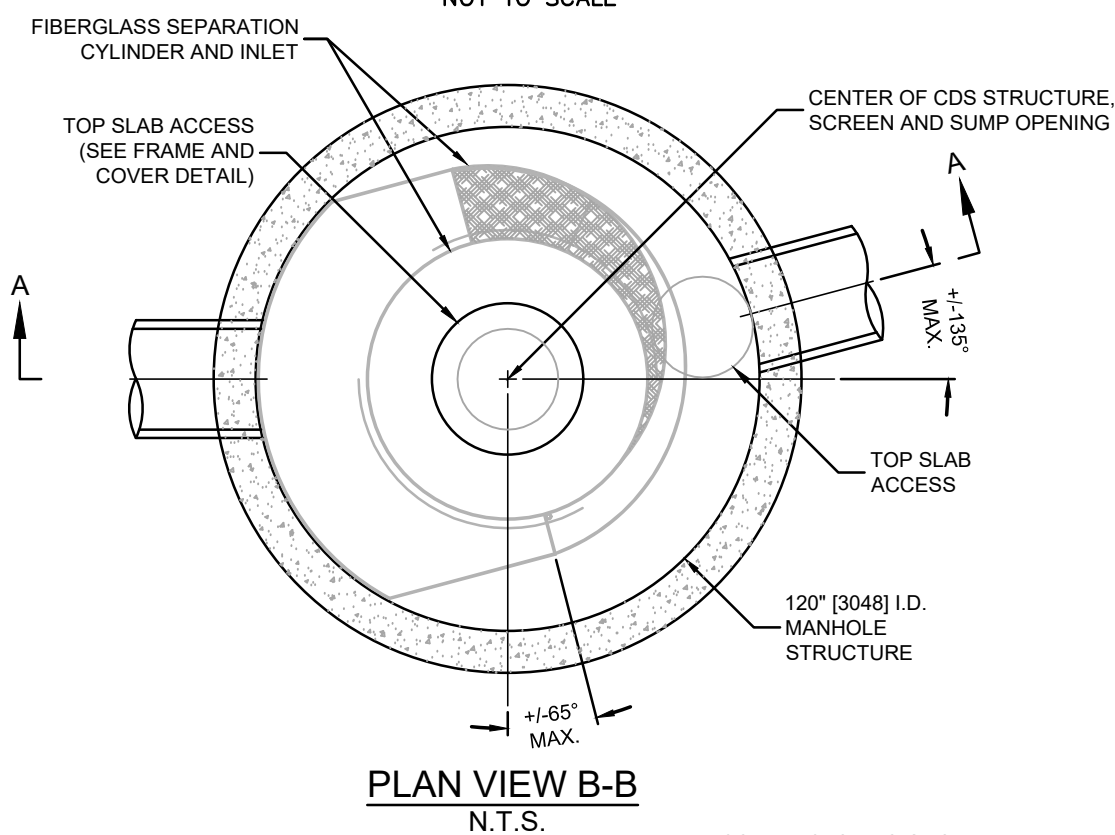
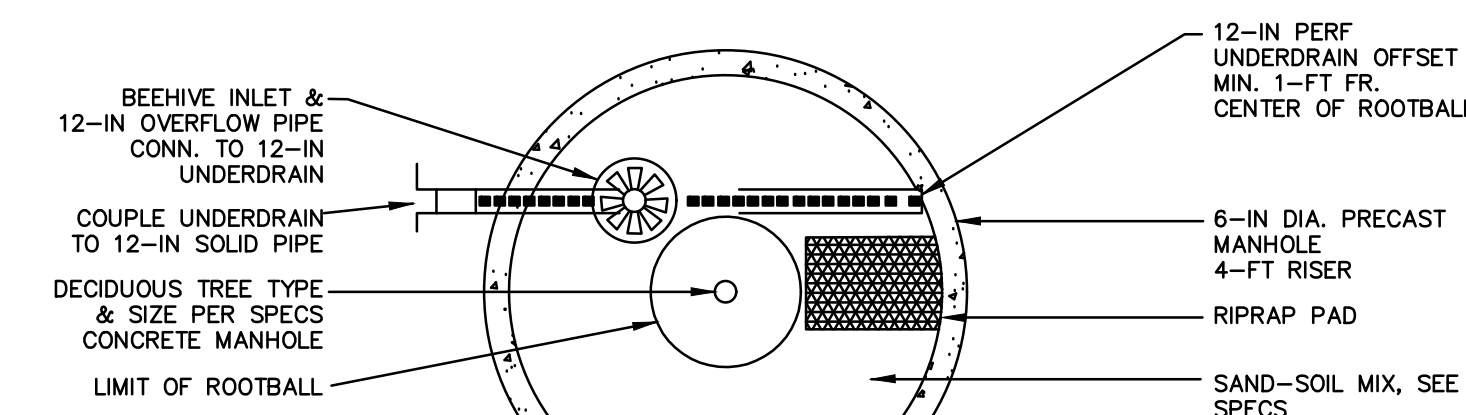
STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



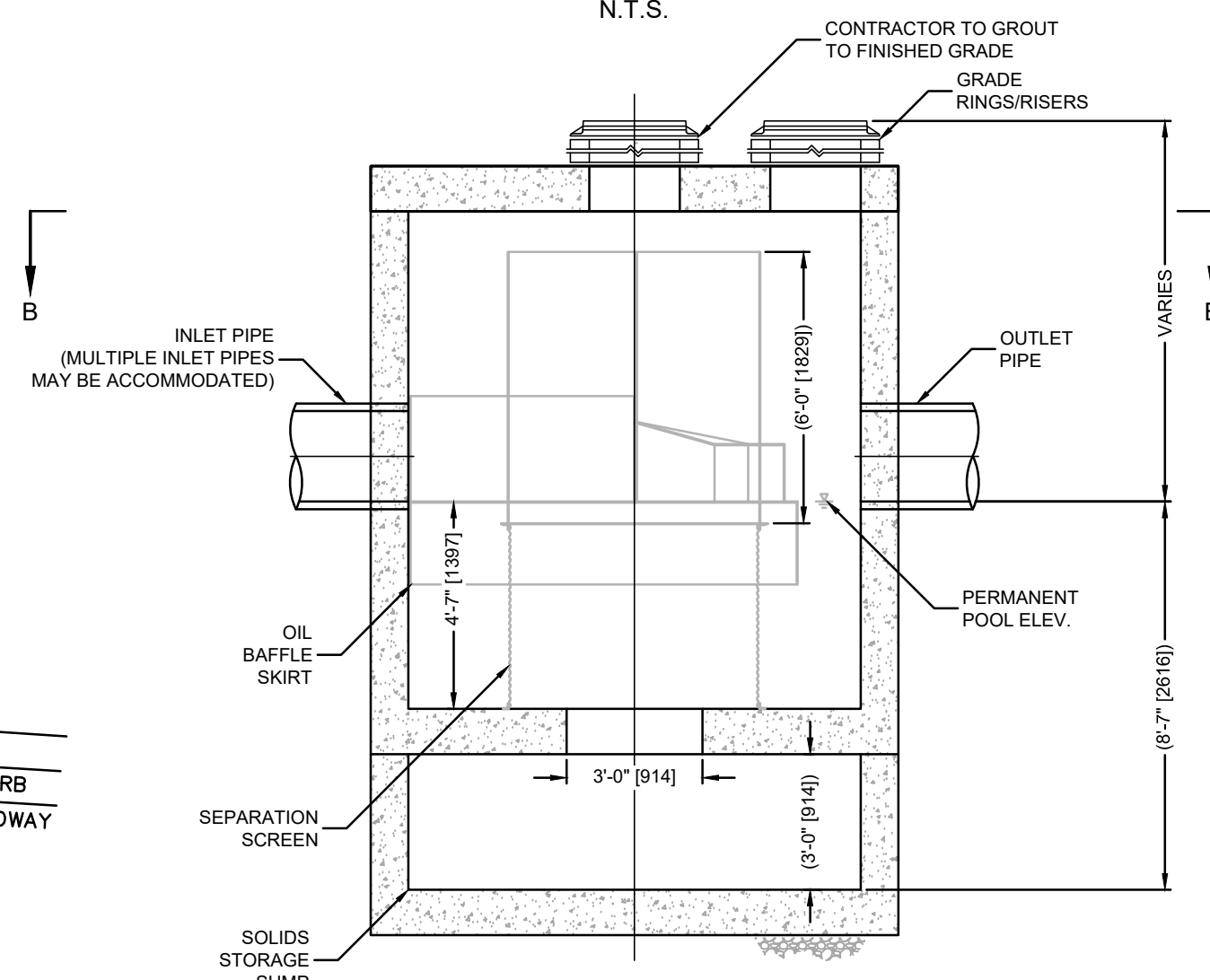
DRIVEWAY DETAIL
NOT TO SCALE



TREE BOX FILTER DETAIL
NOT TO SCALE



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

NOTE: CONTECH CDS INLINE OR APPROVED EQUAL

CONTECH CDS UNIT
NOT TO SCALE

PREPARED BY:

PROJECT:

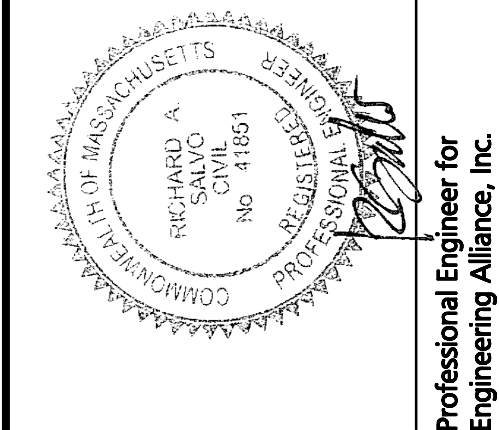
APPLICANT:

Engineering Alliance, Inc.
Civil Engineering & Land Planning Consultants
194 Central Street
Saugus, MA 01906
Tel: (781) 231-1349
Fax: (781) 417-0020

Proposed Site Plan
Arlington Street & Elm Street
(Parcel ID: 1236 2 0)
Watertown, Massachusetts

PROJECT #: 09-27801
SCALE: As Noted
DESIGN BY: Calvin Reach

DATE: March 12, 2021
DWG FILE NAME: 060120.dwg
CHECKED BY: Richard A. Salvo, P.E.



Maximos Hatziliadiades
71 Arlington Street
Watertown, MA 02472

DRAWING TITLE:
D-2 Details Sheet II

DWG. NO.

DESCRIPTION OF REVISION

DATE

DESCRIPTION OF REVISION



BVW MITIGATION AREA (6,930 sf)				
Mitigation area to be cleared of invasive plant material and trash, graded, stabilized and seeded Wetland Restoration Area Seed Mix. In addition, the area will be planted with the following site appropriate woody tree and shrubs.				
SHRUB AREA	SCIENTIFIC NAME / COMMON NAME	QUANTITY	HEIGHT	SPACING
	Clethra alnifolia / Summersweet Clethra	60	2'-3' Ht	36" on Center
	Cornus amomum / Silky Dogwood	60	2'-3' Ht	36" on Center
	Ilex verticillata / Winterberry	48	2'-3' Ht	36" on Center
	Lindera benzoin / Spicebush	48	2'-3' Ht	36" on Center
	Photinia pyrifolia / Red Chokeberry	60	2'-3' Ht	36" on Center
	Salix discolor / Pussy Willow	60	2'-3' Ht	36" on Center
	Sambucus canadensis / Elderberry	60	2'-3' Ht	36" on Center
	Spiraea tomentosa / Steeplebush	48	2'-3' Ht	36" on Center
	Viburnum dentatum / Viburnum	48	2'-3' Ht	36" on Center
	Acer rubrum / Red Maple	8	4'-6' Ht	
	Carpinus caroliniana / American Hornbeam	11	4'-6' Ht	

Shrubs shall be planted in clusters of 2 or 3, and installed not less than 3 feet on center.
A wetland specialist or landscape architect shall provide supervision of the plant layout.
Plant substitutions may be necessary due to commercial availability. Substitutions shall be approved by the supervising wetland scientist or landscape architect and the Town agent.

BVW SHRUB ENHANCEMENT AREA (6,080 sf)				
Shrub enhancement area to help stabilize soils adjacent proposed structures, parking areas and roadways. Material to be hand planted. No grading or heavy machinery in this area.				
SHRUB AREA	SCIENTIFIC NAME / COMMON NAME	QUANTITY	HEIGHT	SPACING
	Clethra alnifolia / Summersweet Clethra	30	2'-3' Ht	36" on Center
	Cornus amomum / Silky Dogwood	30	2'-3' Ht	36" on Center
	Ilex verticillata / Winterberry	24	2'-3' Ht	36" on Center
	Lindera benzoin / Spicebush	24	2'-3' Ht	36" on Center
	Photinia pyrifolia / Red Chokeberry	30	2'-3' Ht	36" on Center
	Salix discolor / Pussy Willow	30	2'-3' Ht	36" on Center
	Sambucus canadensis / Elderberry	30	2'-3' Ht	36" on Center
	Spiraea tomentosa / Steeplebush	24	2'-3' Ht	36" on Center
	Viburnum dentatum / Viburnum	24	2'-3' Ht	36" on Center
	Acer rubrum / Red Maple	8	4'-6' Ht	

Area to receive Wetland Restoration Area mix at prescribed rate.
Shrubs shall be planted in clusters of 2 or 3, and installed not less than 3 feet on center.
A wetland specialist or landscape architect shall provide supervision of the plant layout.
Plant substitutions may be necessary due to commercial availability. Substitutions shall be approved by the supervising wetland scientist or landscape architect and the Town agent.

UPLAND STABILIZATION AREA (810 sf)				
Graded upland area to be seeded with an appropriate seed mix, stabilized with erosion control fabric, and planted with appropriate colonizing shrubs for long-term slope stabilization.				
SHRUB AREA	SCIENTIFIC NAME / COMMON NAME	QUANTITY	HEIGHT	SPACING
	Cornus racemosa / Gray Dogwood	15	2'-3' Ht	36" on Center
	Prunus depressa / Sand Cherry	15	2'-3' Ht	36" on Center

Area to receive Upland Slope Stabilization mix at prescribed rate.
Shrubs shall be planted in clusters of 2 or 3, and installed not less than 3 feet on center.
A wetland specialist or landscape architect shall provide supervision of the plant layout.
Plant substitutions may be necessary due to commercial availability. Substitutions shall be approved by the supervising wetland scientist or landscape architect and the Town agent.

1 WETLAND MITIGATION PLANT SCHEDULE

Scale: NTS

Wetland Mitigation Notes:

- The overall objective of this mitigation area is to create bordering vegetated wetland to mitigate for the alteration of existing bordering vegetated wetland.
- Construction of the mitigation areas shall be done under the guidance of a wetland specialist. The wetland scientist shall be on site verifying the limit of work, the creation of micro-topography, and checking grades during excavation of the mitigation area.
- Mitigation Area Goals:
 - At a minimum, 75% cover with native wetland species within two years of installation.
 - Long term: the establishment of a vegetated wetland
- Prior to construction, straw wattle will be installed as shown on the plans and shall include the boundary of the wetland mitigation area.
- Topsoil from on-site locations may be used if approved by the project wetland specialist (see note 6). Otherwise, manufactured soil using equal portions of mineral and organic materials must be used resulting in not less than 10%-12% organic carbon content by dry weight (or 19%-21% organic matter) as recommended in the ACOE New England District Mitigation Guidelines.
- Prior to translocation of topsoil to the wetland mitigation areas, the topsoil source shall be inspected and approved by the project wetland specialist. Topsoil used for the wetland mitigation area shall have a texture of sandy loam, have a relatively high organic matter content, and must not contain invasive species. Otherwise, manufactured soil as specified in note #5 shall be used.
- The mitigation area final grade shall match the adjacent wetland. The area shall be excavated to the level of 12" below finish grade. The sub-grade shall then be checked by the wetland specialist to ensure proper hydrology has been achieved, and then filled with the approved soil backfill (see notes 5 and 6). Any compaction caused by excavation shall be alleviated and a friable "planting bed" consistency shall be prepared.
- Plant substitutions due to commercial availability or hydrological conditions must be approved by the project wetland specialist and approved by the Conservation Commission. The wetland mitigation areas proposed to be planted with native woody and herbaceous species, then seeded with native seed. (See Plant Mitigation Schedule)
- The mitigation area shall be monitored twice annually (Spring and Fall) for the removal of invasive species, plant health of the mitigation plantings, and hydrologic conditions for a period of two years following construction.
- The mitigation area shall be monitored for noxious and invasive non-indigenous weed species according to the "Massachusetts Invasive Plants Advisory Group" plant list. Invasive plant species found on site include: *Phalaris arundinacea*, *Phragmites australis*, and *Celastrus orbiculatus*. These and all other state listed invasive plant species shall be reported and removed from the mitigation area if found.
- The environmental scientist will notify the Watertown Conservation Commission if "Plants Noted as Invasive" are observed during the monitoring events within 30 days of discovery.
- For each species determined to be present, an environmental scientist will record locations, relative abundance, factors important to establishing a threat level, and corrective measures to be taken. Corrective measures shall depend on the species and density of invasive species. Annual reports shall be provided by December 30th of each year until the monitoring period has ended.
- Annual reports including color photographs and a description of all monitoring activities shall be provided at the Conservation Commission's request. A request for a Certificate of Compliance shall be submitted following the 2nd year of monitoring showing compliance with project goals.
- The erosion control barrier between the wetlands and mitigation areas shall be removed upon stabilization of the mitigation areas and the area raked to eliminate any berm that may be present between the wetland mitigation areas and the adjacent BVW. Any bare soil that results from the removal of the erosion controls shall be seeded with the specified seed mix. All stakes and twine shall be removed.

Prepared by:



15 Research Drive (p) 413.256.0202
Amherst, MA 01002 (f) 413.256.1092
www.swca.com

Prepared For:

Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

LEGEND	
---	PROPERTY LINE
///	LAND UNDER WATER
***	BORDERING VEGETATED WETLANDS (BVW)
---	TRASH CLEANUP AND INVASIVE PLANT CONTROL ONLY AREA
XXX	PROPOSED BVW FILL AREA
---	PROPOSED BUILDING ENVELOPE
---	EXISTING MAJOR CONTOURS
---	EXISTING MINOR CONTOURS
---	PROPOSED CONTOURS
ECB	BIO-WATTLE EROSION CONTROL
○	DELINATION FLAG POINT

PERMIT DRAWINGS

ORIGINAL PLAN SIZE 24"x36"

Project Title:

Arlington Street and Elm Street
Redevelopment Mitigation Plan

Parcel ID: 1236-2-0

Sheet Title:

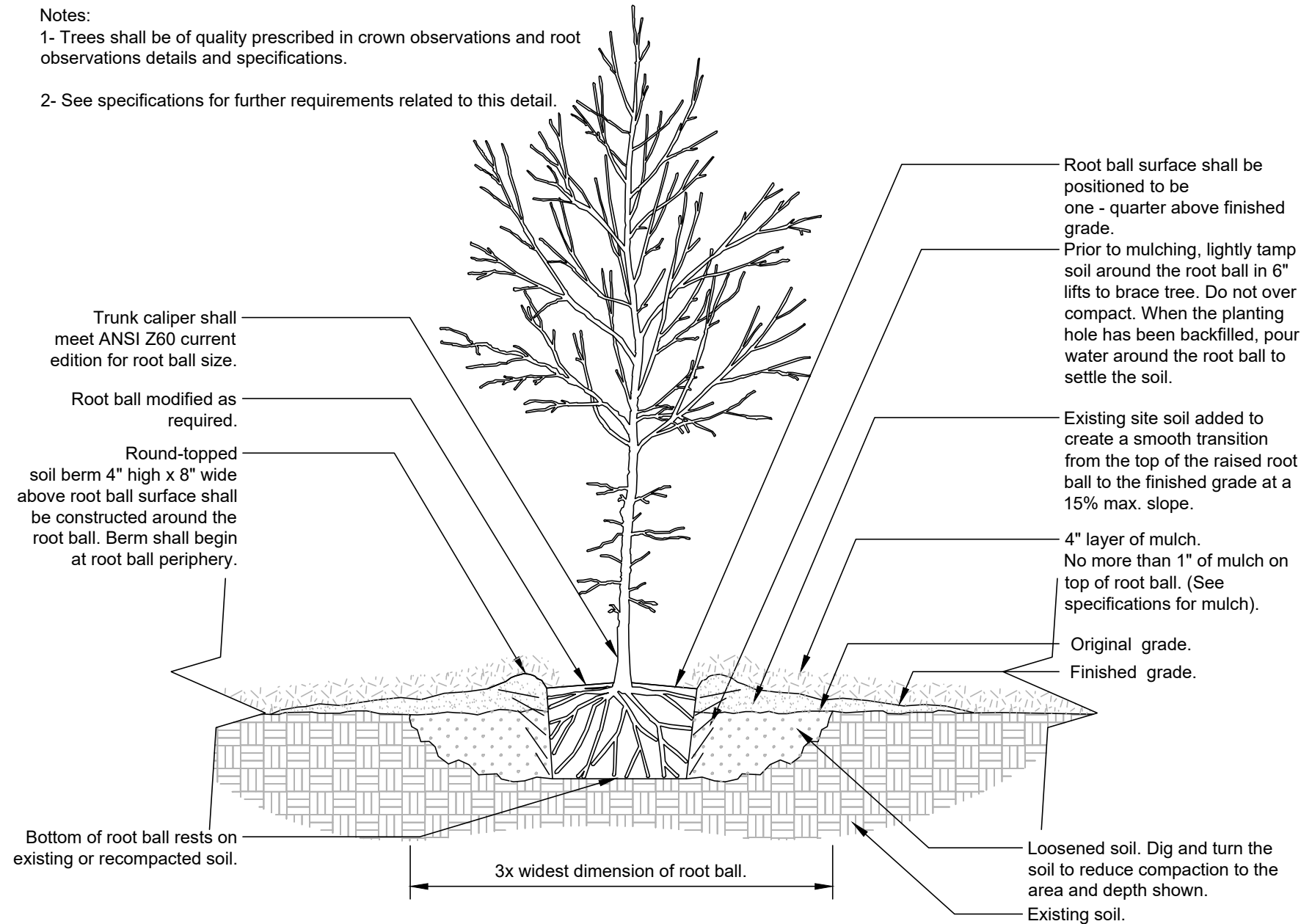
**RESOURCE AREA
MITIGATION PLAN**

Date:	03-10-2021
Drawn by:	TS
Checked by:	CB/VM
SWCA File #	59467.00

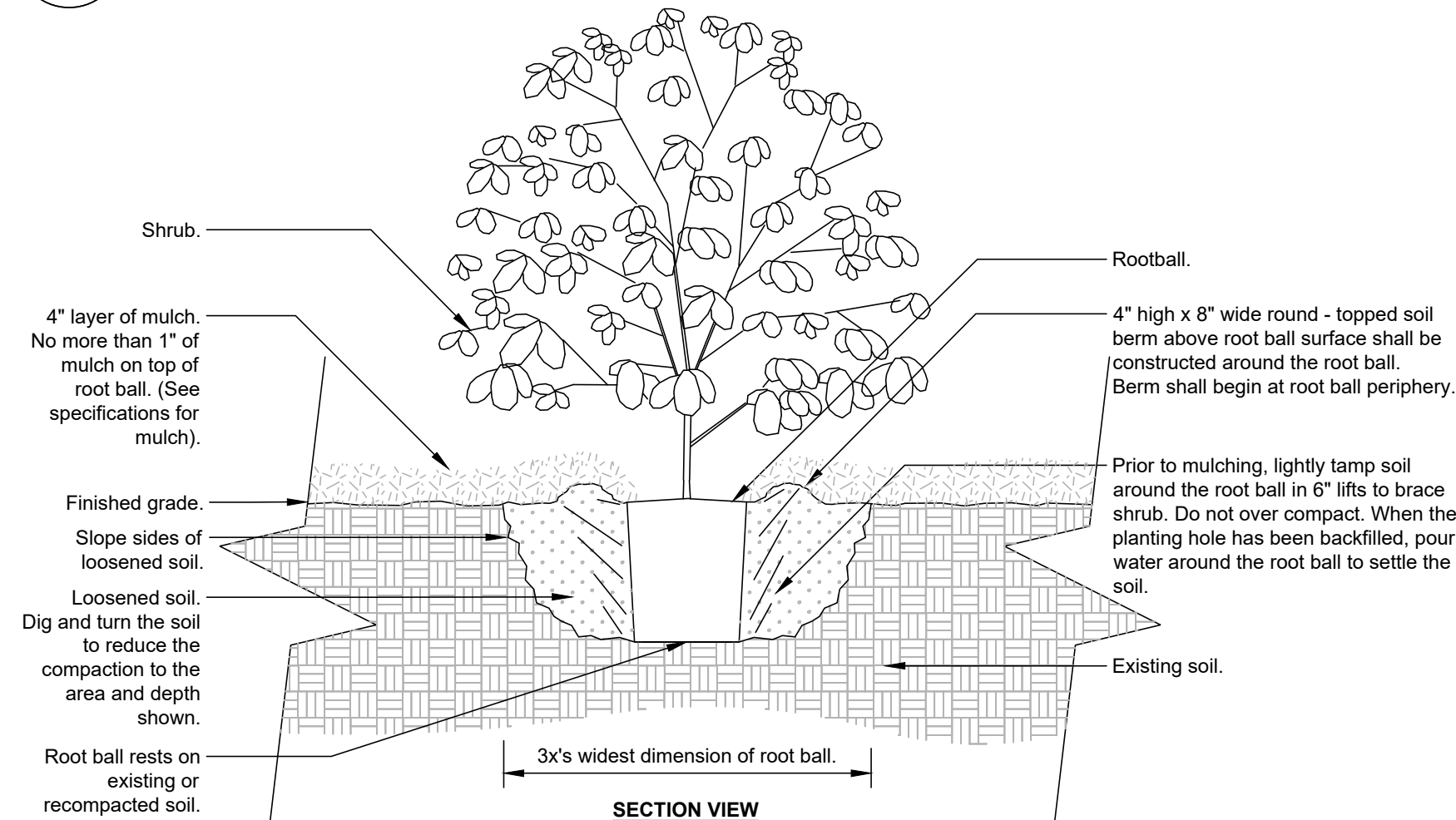
Revisions:		

Scale: As Shown

- Notes:
- 1- Trees shall be of quality prescribed in crown observations and root observations details and specifications.
 - 2- See specifications for further requirements related to this detail.

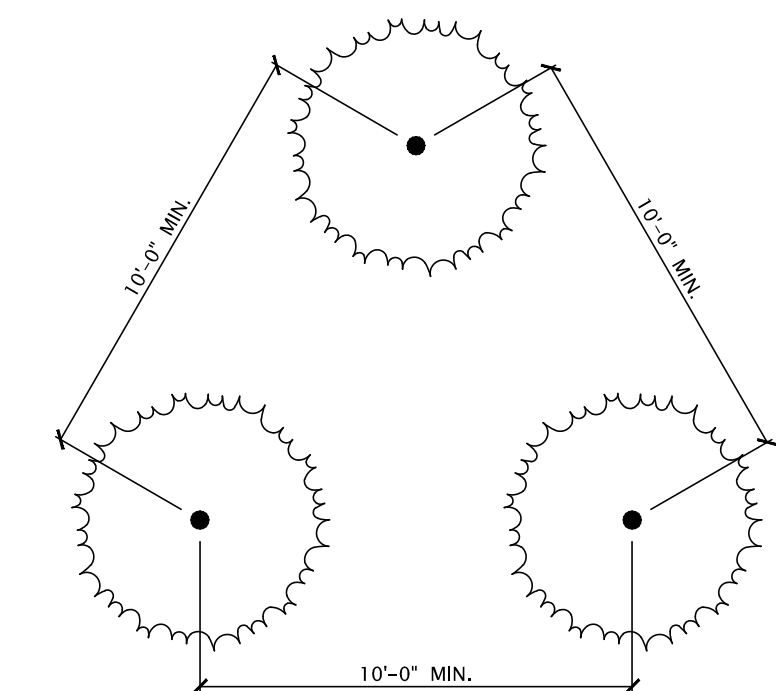


1 TREE PLANTING DETAIL
Scale: NTS

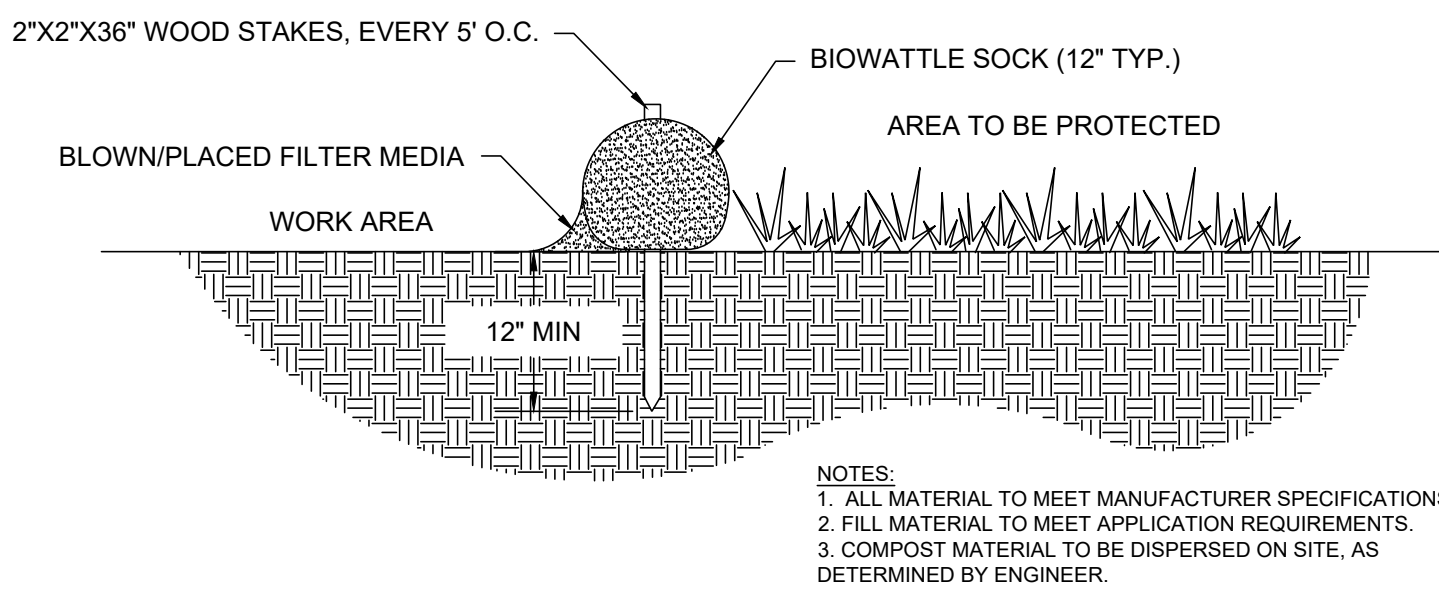


- Notes:
- 1- Shrubs shall be of quality prescribed in the root observations detail and specifications.
 - 2- See specifications for further requirements related to this detail.

2 SHRUB PLANTING DETAIL
Scale: NTS



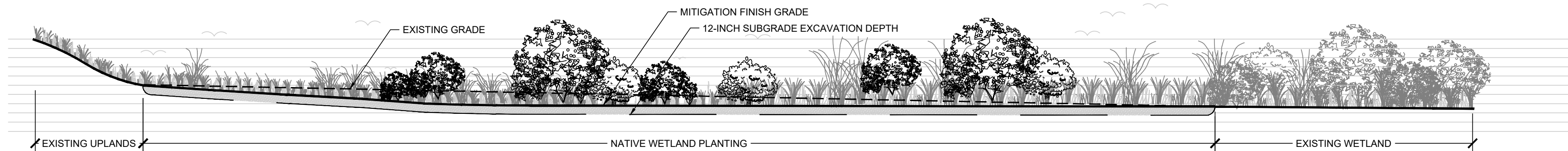
3 TREE SPACING (TYP.)
Scale: NTS



7 BIO-WATTLE EROSION CONTROL
Scale: NTS

New England Erosion Control/Restoration Mix For Detention Basins and Moist Sites		
Botanical Name	Common Name	Indicator
<i>Elymus riparius</i>	Riverbank Wild Rye	FACW
<i>Schizachyrium scoparium</i>	Little Bluestem	FACU
<i>Festuca rubra</i>	Red Fescue	FACU
<i>Andropogon gerardii</i>	Big Bluestem	FAC
<i>Panicum virgatum</i>	Switch Grass	FAC
<i>Vernonia noveboracensis</i>	New York Ironweed	FACW+
<i>Agrostis perennans</i>	Upland Bentgrass	FACU
<i>Bidens frondosa</i>	Beggar Ticks	FACV
<i>Eupatorium maculatum (Eutrochium maculatum)</i>	Spotted Joe Pye Weed	OBL
<i>Eupatorium perfoliatum</i>	Boneset	FACW
<i>Aster novae-angliae (Symphyotrichum novae-angliae)</i>	New England Aster	FACW-
<i>Scirpus cyperinus</i>	Wool Grass	FACW
<i>Juncus effusus</i>	Soft Rush	FACW+
Apply: 18 lbs/acre		

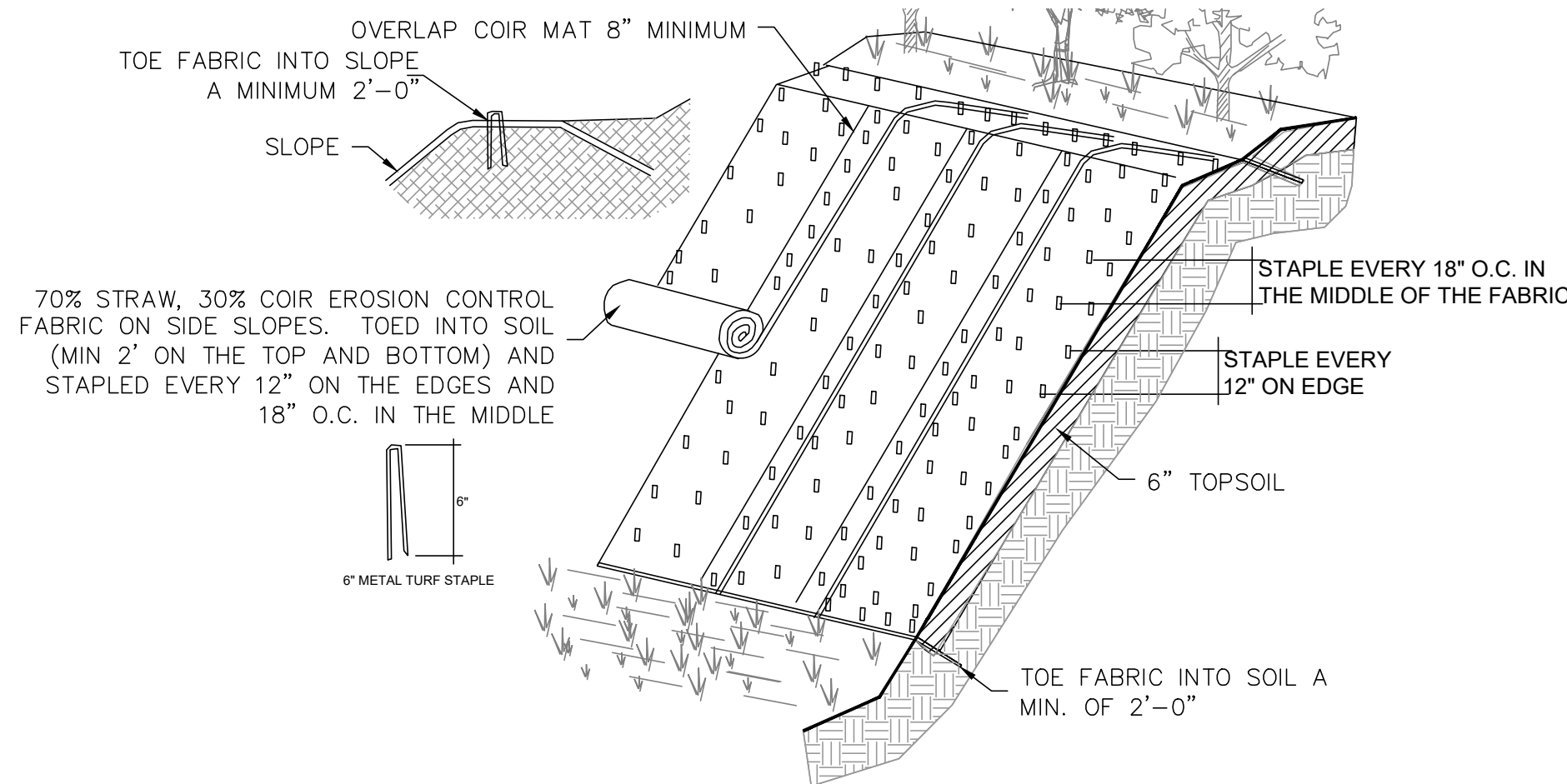
5 WETLAND RESTORATION AREA SEED MIX
Scale: NTS Source: Seed mixes referenced herein are provided by New England Wetland Plants, Inc.



4 WETLAND MITIGATION AREA SECTION (TYP.)
Scale: NTS

New England Erosion Control/Restoration Mix for Dry Sites		
Botanical Name	Common Name	Indicator
<i>Elymus canadensis</i>	Canada Wild Rye	FACU+
<i>Festuca rubra</i>	Red Fescue	FACU
<i>Lolium multiflorum</i>	Annual Ryegrass	
<i>Lolium perenne</i>	Perennial Ryegrass	
<i>Schizachyrium scoparium</i>	Little Bluestem	FACU
<i>Panicum virgatum</i>	Switch Grass	FAC
<i>Sorghastrum nutans</i>	Indian Grass	UPL
Apply: 35 lbs/acre		

6 UPLAND SLOPE STABILIZATION SEED MIX
Scale: NTS Source: Seed mixes referenced herein are provided by New England Wetland Plants, Inc.



8 BIODEGRADABLE EROSION CONTROL FABRIC SLOPE STABILIZATION DETAIL
Scale: NTS

- EROSION CONTROL FABRIC NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS TO ENSURE THAT THE EROSION CONTROL FABRIC WILL HAVE GOOD SOIL CONTACT.
 2. APPLY PERMANENT SEEDING BEFORE PLACING EROSION CONTROL FABRIC.
 3. LAY FABRIC LOOSELY AND STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
 4. STAPLE FABRIC WITH 6" STAPLES. STAPLE FABRIC EVERY 12" ON SIDES, TOP AND BOTTOM. 18" O.C. IN THE MIDDLE OF THE FABRIC. (PER MANUFACTURES SPECIFICATIONS)
 5. THE EROSION CONTROL FABRIC TO BE INSTALLED IN SECTIONS RUNNING FROM THE TOP TO THE BOTTOM OF THE SLOPE, ALONG THE ENTIRE AREAS AS SHOWN ON THE PLAN (PER MANUFACTURES SPECIFICATIONS)
 6. EROSION CONTROL FABRIC SHALL USE BIODEGRADABLE (NON-PLASTIC) NETTING
 7. TO BE USED ONLY IN AREAS OF TEMPORARY SOIL DISTURBANCE ON SLOPES ADJACENT TO THE POND.
 8. FLAT SURFACES SHALL RECEIVE STRAW MULCH APPLIED TO THE GROUND SURFACE AT A RATE OF 2,500 LBS./ACRE.

Prepared by:

SWCA
ENVIRONMENTAL CONSULTANTS

15 Research Drive (p) 413.256.0202
Amherst, MA 01002 (f) 413.256.1092
www.swca.com

Prepared For:

Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

PERMIT DRAWINGS
ORIGINAL PLAN SIZE 24"x36"

Project Title:

Arlington Street and Elm Street
Redevelopment Mitigation Plan

Parcel ID: 1236-2-0

Sheet Title:

DETAILS

Date:	03-10-2021
Drawn by:	TS
Checked by:	CB/VM
SWCA File #	59467.00

Revisions:			

Scale: As Shown

APPENDIX C

**Filing Fee Checks, Fee Transmittal Form, Abutters List
Abutter Notification, Affidavit of Mailing**

SWCA, INC.
 IMPREST ACCOUNT
 15 RESEARCH DRIVE
 AMHERST, MA 01002

DATE March 9, 2021

020086
 11-24/1210

PAY TO THE ORDER OF Watertown Conservation Commission \$ 800-
Eight hundred DOLLARS



MEMO 59467/02 Town State filing fee

[Signature]



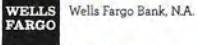
⑈020086⑈ ⑆

SWCA, INC.
 IMPREST ACCOUNT
 15 RESEARCH DRIVE
 AMHERST, MA 01002

DATE March 9, 2021

020087
 11-24/1210

PAY TO THE ORDER OF Commonwealth of Massachusetts \$ 775.00
Seven hundred seventy five DOLLARS

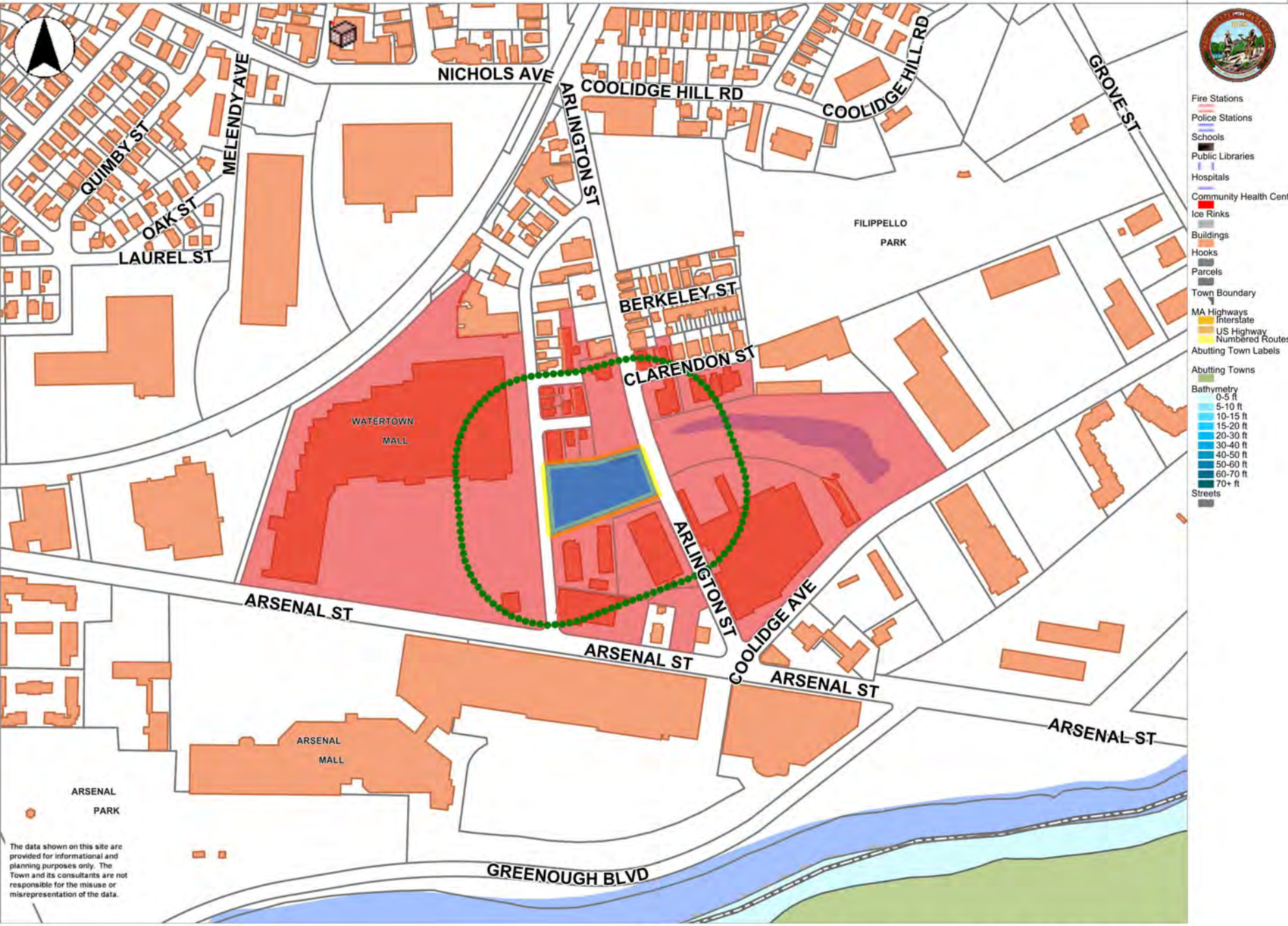


MEMO 59467/02 State filing fee

[Signature]



⑈020087⑈ ⑆



- Fire Stations
- Police Stations
- Schools
- Public Libraries
- Hospitals
- Community Health Centers
- Ice Rinks
- Buildings
- Hooks
- Parcels
- Town Boundary
- MA Highways
 - Interstate
 - US Highway
 - Numbered Routes
- Abutting Town Labels
- Abutting Towns
- Bathymetry
 - 0-5 ft
 - 5-10 ft
 - 10-15 ft
 - 15-20 ft
 - 20-30 ft
 - 30-40 ft
 - 40-50 ft
 - 50-60 ft
 - 60-70 ft
 - 70+ ft
- Streets

The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.

0 570 1140 ft

Printed on 02/17/2021 at 01:09 PM

Parcel ID: 1236 2 0
HATZIILIADES MAXIMOS
5 MADISON ST
BELMONT, MA 02178

Parcel ID: 1234 2 0
WATERTOWN MALL ASSOC
C/O ROSEN ASSOCIATES MGT
33 SOUTH SERVICE RD
JERICHO, NY 11753

Parcel ID: 1236 1K 0
SURREY ROAD LLC
C/O SARACEN PROPERTIES
41 SEYON STREET
SUITE 200
WALTHAM, MA 02453

Parcel ID: 1236 3F 0
SURREY ROAD LLC
C/O SARACEN PROP. LLC
41 SEYON ST, STE 200
WALTHAM, MA 02453

Parcel ID: 1236 4 G
ELM STREET PROPERTY
930 COMMONWEALTH AVE SOUTH
BOSTON, MA 02215

Parcel ID: 1236 5H 0
BP WATERTOWN HOTEL, LLC.
800 BOYLSTON ST
SUITE 1390
BOSTON, MA 02199

Parcel ID: 1237 11 0
HANLON, JR MICHAEL F.
7 YUKON AVE
WATERTOWN, MA 02472

Parcel ID: 1237 12C 0
FORD GEORGE
42 VINELAND STREET
BRIGHTON, MA 02135

Parcel ID: 1237 13A 0
WOLF STEVEN T, TRUSTEE
15 SOLDIERS FIELD PLACE
C/O STEVEN WOLF
9 BLOSSOM LANE
WAYLAND, MA 01778

Parcel ID: 1237 14 0
BUSTEED HARRY
CREMIN CATHERINE M
8 YUKON AV
WATERTOWN, MA 02472

Parcel ID: 1237 15 5
KALAKIDIS SOTIRIA
57 ELM ST
WATERTOWN, MA 02472

Parcel ID: 1237 16 4
NERPOUNI KATHLEEN
59 ELM STREET
WATERTOWN, MA 02472

Parcel ID: 1237 17 3
TRINH TIEN H.
TRAN PHUOC T.
63 ELM ST
WATERTOWN, MA 02472

Parcel ID: 1237 2B C
MASREAL CO INC
C/O BT-NEWYO, LLC.
55 GLENLAKE PKWY NE
ATLANTA, GA 30328

Parcel ID: 1237 32F 0
10 MUNROE LLC
10 MUNROE AVENUE
WATERTOWN, MA 02472

Parcel ID: 1237 9 6
DERMENJIAN CHARLES
374 LAKE STREET
BELMONT, MA 02478

Parcel ID: 1509 1 0
MASREAL COMPANY INC
C/O BT-NEWYO, LLC
55 GLENLAKE PKWY NE
ATLANTA, GA 30328

Parcel ID: 1510 1 0
HATZIILIADES MAXIMOS
5 MADISON ST
BELMONT, MA 02478

Parcel ID: 1510 3 0
HATZIILIADES MAXIMOS
71 ARLINGTON ST REALTY
5 MADISON ST
BELMONT, MA 02478

Parcel ID: 1510 5A 0
RED COAT REALTY LLC
P O BOX 540045
WALTHAM, MA 02454-0045

Parcel ID: 1511 25 37
YE WEI
SUN CHRISTINE
228 WASHINGTON ST
WESTWOOD, MA 02090

Parcel ID: 1511 27 36
BOYD GALE M
BOYD ERIC C
81 ARLINGTON ST
WATERTOWN, MA 02472

Parcel ID: 1511 28 35
BEDROSIAN GREGORY
BEDROSIAN NOMINEE TRUST
3318 ABIGAIL CT
NEW PORT RICHEY, FL 34655



ENVIRONMENTAL CONSULTANTS

Sound Science. Creative Solutions.®

Amherst Office
15 Research Drive
Amherst, Massachusetts 01002
Tel 413.256.0202 Fax 413.256.1092

DRAFT AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act

I, Becky Barber, hereby certify under the pains and penalties of perjury that on March 16, 2021, I gave notification to abutters in compliance with the Massachusetts Wetlands Protection Act in connection with the following matter:

A Notice of Intent filed under the Massachusetts Wetlands Protection Act by the Applicant, Maximos Hatziliades with the Watertown Conservation Commission on October 8, 2020. The form of notification, and a list of the abutters to whom it was given and their addresses, are attached to the Affidavit of Service.

Name _____

Date _____

APPENDIX D

Draft Release Abatement Measure Plan



F.W. WEBB COMPANY

December 28, 2020

Massachusetts Department of Environmental Protection
Northeast Regional Office
205 Lowell Street
Wilmington, MA 01887

**Re: DRAFT Release Abatement Measure (RAM) Plan
Undeveloped Property
Arlington Street, Watertown, MA
Watertown Parcel ID No. 1510-1-0
MassDEP RTN 3-0457
F.W. Webb/AEG Project No. 2999.01**

Dear Sir or Madame:

On behalf of Mr. Maximos Hatziliades and SWCA Environmental Consultants, Alliance Environmental Group / An F.W. Webb Company (F.W. Webb/AEG) has completed a DRAFT Release Abatement Measure Plan for a redevelopment project at Arlington Street (Watertown Assessor's Parcel 1236-2-0) in Watertown, Massachusetts, hereinafter the "Site."

In response to the presence of nickel, beryllium, chromium, benzo(a)pyrene and xylenes in soil, a Class B-1 Response Action Outcome (RAO) Statement was filed for the Site with the Massachusetts Department of Environmental Protection (MassDEP) in September 2008. Some of the soil excavation activities associated with the proposed redevelopment at the Site will constitute a Remedial Action after the submittal of Permanent Solution Statement to MassDEP. Since soil excavation activities will likely involve the excavation of more than 100 cubic yards, the remedial actions must be conducted as a RAM as specified in the Massachusetts Contingency Plan (MCP) 310 CMR 40.1067(5)(b).

In accordance with 310 CMR 40.0440, the response actions detailed within this RAM Plan have been designed to support the redevelopment of the Site which includes the construction of a building where a Permanent Solution Statement has been previously submitted to MassDEP. Concurrent with this RAM Plan, a RAM Transmittal Form (BWSC-106) has been uploaded to eDEP. In accordance with 310 CMR 40.0444(2), the RAM Plan fee of \$980.00, payable to The Commonwealth of Massachusetts, and a copy of the first

page of the RAM transmittal form (BWSC 106) were mailed to the MassDEP Lock Box at P.O. Box 4062 in Boston, Massachusetts 02211-4062.

As this RAM Plan proposes the off-Site disposal of over 1,500 cubic yards of Remediation Waste, the Responsible Party undertaking this response action is required to provide a Certification of Financial Assurance, in accordance with 310 CMR 40.0442(5). A copy of this certification is provided in **Appendix A**.

Public notice of proposed RAM implementation will be provided to both the Watertown Health Department and the City Manager's Office to satisfy the notification requirement under 310 CMR 40.1403(3)(d). Copies of these notices are included in **Appendix A**.

F.W. Webb/AEG's investigations are detailed in the attached report. If you have any questions or required additional information, please contact the undersigned at 401-732-7600.

Sincerely,

Alliance Environmental Group / An F.W. Webb Company

(Electronic Signature)

Thomas Hevner, P.E., L.S.P.

Vice President – Engineering

Mass PE #41789, Mass LSP #3635

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FIGURES

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- Figure 2 Site Plan
- Figure 3 MassGIS Phase I Site Assessment Map

APPENDICES

- Appendix A RAM Transmittal Form BWSC-106, Notices to Municipal Officials, and Certificate of Financial Assurance
- Appendix B Remedial Additives Plan – Example

GLOSSARY OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS

AEG	Alliance Environmental Group – Warwick, RI
Alpha	Alpha Analytical – Westboro, MA
ASTM	American Society of Testing and Materials
BMP	Best Management Practices
BOL	Bill of Lading – BWSC-112
BVW	Bordering Vegetated Wetlands
BWSC	Bureau of Waste Site Cleanup
CMR	Code of Massachusetts Regulations
COC	Contaminant of Concern
° F	Degrees Fahrenheit
DPS	Downgradient Property Status
eDEP	Electronic DEP (MassDEP)
F.W. Webb	Parent Company of AEG – Bedford, MA
FEMA	Federal Emergency Management Agency
GIS	Geographical Information Systems
GW	Groundwater
HASP	Health and Safety Plan
LSP	Licensed Site Professional
M1RC	Method 1 Risk Characterization
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan – 310 CMR 40.0000
mg/kg	milligrams per kilogram – parts per million
mg/L	Milligrams per Liter – parts per million
MGL	Massachusetts General Law
MSR	Material Shipping Record
NSR	No Significant Risk
OSHA	Occupational Safety and Health Administration
ppb	parts per billion
ppm	parts per million
ppmv	parts per million per volume
PCB	Polychlorinated Biphenyls
P.E.	Professional Engineer
PID	Photoionization Detector
PM10	Particulate Matter – 10 micrometers or less in diameter
PSS	Permanent Solutions Statement
QA/QC	Quality Assurance/Quality Control
QEP	Qualified Environmental Professional
RAM	Release Abatement Measure
RAO	Response Action Outcome
RAPs	Response Action Performance Standards – 310 CMR 40.0191

RC	Reportable Concentrations – 310 CMR 40.1600
RNF	Release Notification Form
RTN	Release Tracking Number
SF	Square Foot or Square Feet
USGS	United State Geological Survey
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
WSC	Waste Site Cleanup

1.0 Introduction

In accordance with the MCP 310 CMR 40.04444(1), a RAM Plan should include the following items:

According to the MCP at 310 CMR 40.04444(1), a RAM Plan should include the following items:

1. Name, address, telephone number and relationship to the responsibility for conducting the RAM (**Section 2.1**);
2. Description of the release(s), Site conditions and surrounding receptors (**Section 2.2**);
3. RAM Plan objective(s), specific plan(s) and proposed implementation schedule (**Section 3.0**);
4. Statement as to whether Remediation Waste, Remedial Wastewater and/or Remedial Additives will be excavated, collected, stored, treated, discharged, applied, reused, or otherwise managed at the Site; (**Section 3.3**)
5. Proposed environmental monitoring plan, where appropriate; (**Section 3.7**)
6. Listing of federal, state, and/or local permits likely to be need to conduct the Release Abatement Measure; (**Section 3.9**)
7. Seal and signature of the Licensed Site Professional who prepared the RAM Plan; (**Section 3.10**)
8. Certification of financial assurance if management of greater than 1,500 cubic yards of Remediation Waste is planned; (**Section 3.11**) and
9. Other information required by MassDEP during its review and evaluation of a RAM Plan determined to be necessary to complete a RAM Plan.

According to the MCP at 310 CMR 40.0442(3), a RAM Plan that involves the construction of a structure which could prevent or impede the implementation of response actions in the future should also include an assessment of Site conditions, focused risk characterization, Background feasibility evaluation and other requirements. Refer **Section 4.0**.

These items are addressed in the following section and appendices of this RAM Plan.

2.0 Background Information

2.1 Responsible Parties for Performance of RAM

The entity undertaking the RAM as Owner is:

Maximos Hatziliades
5 Madison Street
Belmont, MA 02478
Telephone Number: 617-489-6645

The Licensed Site Professional (LSP)-of-Record assisting in the completion of the RAM is:

Thomas Hevner, P.E., L.S.P.
MA LSP Registration No. 3635
Alliance Environmental Group, An F.W. Webb Company
100 Jefferson Boulevard, Suite 220
Warwick, RI 02888
Telephone Number: 401-732-7600

2.2 Description of the Release, Site Conditions, and Surrounding Receptors

2.2.1 Description of the Release

The Site is known as “Arlington Street” and is listed with the Watertown Assessors Office as Parcel 1236-2-0. The Site has a release tracking number (RTN 3-0457) issued by Massachusetts Department of Environmental Protection (MassDEP). The identified contaminants of concern (COCs) as discussed in the September 2008 Response Action Outcome (RAO) Statement are benzo(a)pyrene, xylenes, and three metals (nickel, beryllium, and chromium) detected in soil. The RAO was class B-1, indicating that assessed conditions approached Background without remediation.

The Site may have been used as a landfill in the past, and several of the adjacent properties were industrial in nature. The groundwater table is located between approximately 8 and 10 feet below grade depending on the surface elevation at the Site.

The Site contains wetlands that were previously determined to have been impacted by off-Site sources. A downgradient property status (DPS) submittal was filed with MassDEP in 2007 for the Site and the adjoining property known as Sawins Pond. The DPS was limited

to the pond and wetland areas. RTN 3-29157 was created for the DPS to separate the ponds and wetlands from the release conditions associated with RTN 3-0457.

MassDEP issued a Notice of Audit findings on April 1, 2010 for the DPS Opinion and RAO Statements for RTNs 3-0457 and 3-29157. The Audit assigned RTN 3-29157 to the DPS portion (ponds and wetlands) of RTN 3-0457. The audit did not identify any deficiencies in the RAO or DPS and concluded that the property/Site owner (Mr. Hatziliades) was not required to take additional actions.

The Sawins Upland parcel has a third RTN (3-31172) on file with MassDEP. A Permanent Solution Statement (PSS) was filed for RTN 3-31172 in October 2017.

Available information also indicates that the concentrations of COCs detected in groundwater during 2016 are significantly lower than those identified in the September 2008 RAO for RTN 3-0457, and are currently below applicable MCP Method 1 GW-2 and GW-3 Groundwater Standards.

2.2.2 Site Conditions

The parcel is wooded with Bordering Vegetated Wetlands (BVW) located adjacent to a perennial stream, locally referred to as Williams Brook. The site is undeveloped. Four (4) culverts currently exist on-Site, two entering from Elm Street (24-inch diameter and 72-inch diameter) and two existing toward Arlington Street (4-foot by 6-foot and 72-inch diameter). The existing 24-inch diameter culvert discharges into BVW through a headwall that is currently in disrepair.

The entirety of the subject parcel slopes inward from the surrounding area to the area classified as land under water. Elevations range from 24 (+/-) at the parcel perimeter down to 10 (+/-) at the discharge point (6-foot culvert to Arlington Street).

2.2.3 Surrounding Receptors

The Site is located in a mixed industrial, commercial, and residential area. The Williams Pond Parcel, which is 1.42 acres in size, is bordered by commercial properties, residential properties and the UPS Customer Services Office to the north; Arlington Street (beyond which is Sawins Pond) to the east; Gymit Fitness Center and A-Affordable Auto Insurance to the south; and Elm Street (beyond which is the Watertown Mall) to the west.

2.3 Proposed Construction

The Site owner proposes to construct a two-story mixed-use building in the northwest corner of the 1.42± acre parcel of land located on Arlington Street in Watertown, MA (Parcel ID: 1236 2 0). The proposed structure consists of a 7,150 SF footprint which will

consist of 3,500 SF of retail space and 3,650 SF of warehouse on the first floor, and 7,150 SF of warehouse on the second floor. Due to the existing topographic elevation drop in the southeast direction, the building will be situated on a partial mechanically-stabilized earth (MSE) retaining wall structure. Nineteen (19) exterior surface parking spaces will be provided on-Site for the proposed development. The property abuts Elm Street to the west, Arlington Street to the east, and commercial land to the north and south.

The property will have access driveways on both Elm Street and Arlington Street. One-way entry will be provided via a sixteen-foot (16') driveway from Elm Street. Two-way entry will be provided via a twenty-four-foot (24') driveway from Arlington Street. Vehicles will only be permitted to exit the property onto Arlington Street.

A large portion of the subject parcel is occupied the perennial stream and BWV areas. In order to accommodate the proposed development, approximately 4,212 SF of BVW will be filled in. To mitigate the proposed wetland fill, approximately 6,750 SF of wetland replication is proposed on-Site. No work will occur within the perennial stream(area classified as land under water).

The existing 24-inch diameter culvert that enters the property from Elm Street discharges to the BVW located on-Site. The headwall for the culvert entrance is currently in disrepair. The proposed project includes the demolition of the existing concrete headwall, installation of a water quality structure at the discharge point between the existing culvert and BVW, and construction of a new concrete headwall as part of the proposed wetland replication area.

3.0 RAM Plan

The planned RAM activities are limited in scope and complexity and so meet the performance criteria described in 310 CMR 40.0441(2). In the northern portion of the Site, soil deemed unsuitable for construction will be excavated to facilitate the redevelopment effort which includes the construction of a building. The planned RAM activities, as further described in **Section 3.2**, are common activities performed on construction projects in urban areas.

3.1 RAM Plan Objectives

The objective of this RAM Plan is to manage soil that will be excavated during construction. Dewatering discharges will be containerized for off-Site disposal or discharged on-Site under the MCP 310 CMR 40.0045(4). The RAM Plan has been developed to be protective of construction workers during direct contact with potentially contaminated soil, surrounding receptors, and future occupants (including children) at the proposed redeveloped Site. In addition, the RAM Plan was developed so that future investigation and remediation, if necessary (although not expected), will not be significantly impeded by construction of the building at the Site.

3.2 Planned RAM Activities

Planned RAM activities include the following:

- ***Demolition of Below-Grade Structures:*** Demolition of below-grade portions of potential previous building foundations, or other obstructions to proposed construction including railroad rails and ties, former bulkheads and remnant utilities may be necessary as part of proposed construction.
- ***Soil excavation and off-site soil reuse, recycling, and/or disposal:*** Approximately 1,500 cubic yards of soil may be excavated and disposed of off-Site as part of the project. Management of soil as Remediation Waste is further described in **Section 3.3**. Some of this soil will likely be reused on-Site as backfill material.
- ***Soil handling:*** Soil will be excavated to depths up to at least 4 feet below current grade across the Site. The soil is likely to either be re-used on-Site as backfill or be loaded directly onto trucks and transported off-Site for reuse, recycling, and/or disposal at an appropriate receiving facility. Some soil may be stockpiled on-Site for temporary storage. Excavated material will be stockpiled separately based on the anticipated disposal location (based on existing pre-characterization) or based

on field screening results. At a minimum, excavated material with visible stains or unnatural odor indicative of oil and/or hazardous materials (OHM) will be separated from material that does not exhibit these characteristics. Soil will be stockpiled on a 6-mil-thick polyethylene barrier or other impervious surface, if necessary, and covered with a 6-mil-thick polyethylene barrier in bermed areas where storm water runoff is diverted from the stockpile(s).

- ***Soil screening and additional characterization:*** We will periodically screen material on-Site as it is excavated. The screening will consist of visual and olfactory observations combined with jar-headspace measurements of volatile organic compounds (VOCs) using a photoionization detector (PID). If we identify material during excavation as having characteristics inconsistent with those identified during pre-characterization, the material will be stockpiled separately and further characterized.
- ***Reuse or on-site treatment of Toxicity Characteristic Leaching Procedure (TCLP) contaminated soils:*** Up to approximately 150 cubic yards of soil categorized as potential hazardous waste if excavated and disposed off-Site because the TCLP results for leachable lead were greater than 5 milligrams per liter (mg/L), was identified during the soil pre-characterization program. Total lead concentrations in this area were up to 993 milligrams per kilogram (mg/kg). If this soil is reused within the boundaries of the Site, it is not classified as hazardous waste. Due to elevated total lead concentrations, if the soil is reused on-Site it will be placed at depths greater than 3 feet or below building additions or pavement. If the soil is disposed of off-Site, it may be treated prior to excavation and off-Site removal. If the soil is treated, EnviroBlend® reagent or similar will be applied to the affected soil and mixed with the bucket of an excavator. The mixing zone will be constantly sprayed with water to suppress dust and to activate reagents. After treatment is completed, confirmatory samples will be collected to ensure that the soil no longer contains leachable lead greater than 5 mg/L. Treated material would be transported off-Site to an out-of-state non-hazardous landfill. Management of soil as Remediation Waste is further described in **Section 3.3**. Because this treatment would include applying Remedial Additives within 100 feet of occupied residences, a Remedial Additive Plan has been developed, per 310 CMR 40.0046(3) (**Appendix B**). If Remedial Additives are applied, this plan will be followed.
- ***Additional site assessment, if necessary:*** If required, additional assessment activities will be conducted to further characterize soil and groundwater conditions prior to excavation and off-Site transport, or to provide confirmatory data for regulatory compliance.

- **Construction dewatering and groundwater management:** Dewatering discharges will be containerized for off-Site disposal or discharged on-Site under 310 CMR 40.0045(4).
- **Site Access Control:** Access to the Site will be restricted to authorized persons during construction. A perimeter fence will be erected prior to the start of RAM activities and will be secured during non-working hours.
- **Underground storage tank (UST)/drum removal, if necessary:** Although not expected, if evidence of a possible drum or UST is encountered, work will be temporarily stopped. The presence of a UST will require Watertown Fire Department notification. The area will be screened for the presence of OHM using a PID and visual/olfactory observations. Material considered to be contained within the drum/UST will be evaluated by the LSP or designated Site representative. The materials and drum/UST will be disposed of in accordance with applicable rules and laws.

Periodic RAM Status Reports documenting the status of the soil management activities completed at the Site will be prepared and submitted to MassDEP in accordance with the MCP 310 CMR 40.0445.

3.3 Remediation Waste Management

RAM activities will involve management of contaminated soil (i.e.; Remediation Waste) prior to treatment and/or off-Site removal for reuse/disposal/recycling/treatment. Excavated soils, including Remediation Waste, will be managed in accordance with 310 CMR 40.0030, and this RAM Plan. ***Pre-characterization of Site conditions will be conducted prior to the implementation of construction activities.***

Excavated materials are typically anticipated to be directly loaded for transport to approved receiving facilities proposed by the Contractor, under MassDEP Bills of Lading (BOL), signed/stamped by the undersigned L.S.P. Excavated materials will be monitored on a part- to full-time basis during excavation for visual and olfactory evidence of contamination (such as observed discoloration, texture and/or odor). Additional testing may also be performed for supplemental characterization as required by receiving facilities. If stockpiling of material is necessary, stockpiles will be secured to restrict access by the public and covered with polyethylene sheeting as necessary to control dust.

3.4 Similar Soils Management

The proposed excavation will include management of soils which exhibit concentrations less than applicable MCP RCS-1 Reportable Concentrations, including Miscellaneous Fill, Cohesive Fill, Organic Deposits, and Natural Soils. These soils are typically anticipated to be directly loaded for transport to approved receiving facilities proposed by the Contractor

under MassDEP Material Shipping Records (MSRs), signed and stamped by a Qualified Environmental Professional (QEP), or other documentation as applicable. These soils will be managed as outlined in this RAM Plan and in accordance with antidegradation provisions outlined at 310 CMR 40.0032(3), the Similar Soils Provision Guidance, Policy WSC #13-500, and the Interim Policy on Re-Use of Soil for Large Reclamation Projects, COMM-15-01.

3.5 On-Site Soil Reuse Criteria

Although planned construction activities will remove the majority of Miscellaneous Fill, Cohesive Fill, Organic Deposits, and Marine Sand Deposits from within the proposed building limits, excavated Fill and/or natural materials may be reused as backfill behind the earth support system, around footing foundations (if suitable for geotechnical purposes), for Site grading, and for backfilling utility connections.

3.6 Environmental Monitoring Plan

The contractor will prepare and implement a project Health and Safety Plan (HASP) to protect Site workers from potentially contaminated material.

The contractor will also provide appropriate controls to minimize dust generation. Air monitoring for the health and safety of excavation workers will be performed by the contractor as necessary during the RAM. Action levels and contingency plans will be included in the contractor's project HASP. Dust monitoring will be performed at the Site perimeter by the contractor during excavation for the health and safety of surrounding receptors. The action level for dust (measured as PM₁₀) at the Site perimeter will be 0.150 milligrams per cubic meter in accordance with 310 CMR 6.00. Dust mitigating measures, such as wetting down soils with water, will be conducted if the dust generation action levels are exceeded.

F.W. Webb/AEG as LSP will prepare our own HASP for the protection of F.W. Webb/AEG employees. If action levels as defined in our HASP are exceeded, we will notify the Site Owner or the construction manager, who will notify workers in the immediate area.

3.7 Contingencies

If during work, potentially hazardous conditions are evident, work in the area will be suspended, and the area will be secured to protect against a health risk or release to the environment. These conditions include, but are not limited to, strong chemical odors, flooding, personal injury, exposure to toxic chemicals and encountering unexpected hazardous materials, un-containerized wastes, buried containers and drums.

Based on the results of Site history review, subsurface explorations and chemical testing programs conducted at the Site, no known specific point sources of contamination or

abandoned USTs have been identified to date. In the event conditions warrant it, the required notification will be made to MassDEP in accordance with 310 CMR 40.0300 and to the Watertown Fire Department, as applicable.

3.8 Federal, State, and Local Permits and Requirements

Remediation Waste will be transported off-Site under a BOL and <RCS-1 Material will be transported off-Site under a MSR. The Site Owner will sign all BOLs, MSRs and/or manifests as the generator in accordance with 310 CMR 40.0034/0035.

No other environmental investigation or remediation-related permits are anticipated. The presence of nature resources (wetlands and a stream) at the Site will require local, state, and possibly federal permit submittals.

3.9 RAM Implementation Schedule

The RAM is expected to begin in July 2021 and be completed by May 2022.

3.10 Seal and Signature of Licensed Site Professional

Thomas Hevner is the L.S.P. for implementation of the RAM. The L.S.P. seal and signature are provided on the RAM Plan Transmittal Form BWSC-106 which has been submitted electronically on eDEP, an unsigned copy of which is included in **Appendix A**.

This document contains material facts, data, and other information that support the L.S.P. Opinion that, to the best of the L.S.P.'s knowledge, information and belief, the response actions that are the subject of this submittal (i) have been developed in accordance with the applicable provisions of M.G.L.c.21E and 310 CMR 40.0000, (ii) are appropriate and reasonable to accomplish the purposes of such response actions as set forth in the applicable provisions of M.G.L.c.21E and 310 CMR 40.0000, and (iii) comply with the identified provisions of all orders, permits, and approvals identified in this submittal.

3.11 Financial Assurance

The proposed RAM may involve excavation of more than 1,500 cubic yards of soil with OHM concentrations in excess of applicable RCS-1 Reportable Concentrations. Therefore, in accordance with Section 40.0442(5) of the MCP, acknowledgment of the financial impacts and demonstration of sufficient financial reserves is required. The Site Owner has been informed of the costs to complete the work described in the RAM. Monies to adequately cover the costs associated with the implementation of the RAM are available. A statement providing the certification of knowledge and financial resources executed on behalf of the Site Owner is included in **Appendix A**.

3.12 Greener Technologies

Changes to the MCP promulgated in April 2014 require that response actions incorporate Greener Cleanup Best Management Practices (BMPs) to the extent feasible. Specifically, at 310 CMR 40.0191(3)(e), in order to be compliant with Response Action Performance Standards (RAPS), responsible parties must take into consideration the following:

“Eliminating or reducing, to the extent practicable and consistent with response action requirements and objectives, total energy use, air pollutant emissions, greenhouse gases, water use, materials consumption, and ecosystem and water resources impacts resulting from the performance of response actions through energy efficiency, renewable energy use, materials management, waste reduction, land management, and ecosystem protection.”

Therefore, F.W. Webb/AEG has evaluated the feasibility of incorporating Greener Cleanup BMPs into the response actions described within this RAM Plan Addendum. F.W. Webb/AEG has used as guidance in this effort the MassDEP’s “Greener Cleanup Guidance” WSC #14-150, and ASTM standard E2893-13 “Standard Guide for Greener Cleanups.”

Due to the limited scope of the response actions which will occur under this RAM Plan, the applicable BMPs are limited to environmental oversight, monitoring, and sampling activities. F.W. Webb/AEG has identified the following BMPs from the ASTM guidance that will be implemented during the completion of the proposed RAM Activities:

BMP 1

- **Identified BMP:** Use local staff (including subcontractors) when possible to minimize resource consumption.
- **Specifics of implementation:** Whenever possible, F.W. Webb/AEG will utilize applicable field staff from the office(s) closest to the Site.

BMP 2

- **Identified BMP:** Implement an idle reduction plan.
- **Specifics of implementation:** At the pre-field meeting and daily tailgate meetings, on-Site staff will be reminded to minimize idling of vehicles. Exceptions for health and safety related personnel and heating or cooling are acceptable.

BMP 3

- **Identified BMP:** Contract with a laboratory that uses green practices and/or chemicals.
- **Specifics of implementation:** If samples are collected for laboratory analysis, F.W. Webb/AEG has identified Alpha Analytical in Westboro, MA as the laboratory that will be used. F.W. Webb/AEG will contact Alpha to determine the level of green practices that they use.

BMP 4

- **Identified BMP:** Use local laboratory to minimize impacts from transportation.
- **Specifics of implementation:** If samples are collected for laboratory analysis, F.W. Webb/AEG has identified Alpha Analytical in Westboro, MA as the laboratory that will be used. Westboro is closely situated to Watertown, and Alpha also has a satellite pick up facility in Foxboro, MA. F.W. Webb/AEG will either deliver samples directly to the laboratory or have a laboratory courier pick up the samples at F.W. Webb/AEG's office. Alpha-Westboro is located approximately 27 miles from the Site and 14 miles from F.W. Webb/AEG's Bedford, MA office.

4.0 Requirements of 310 CMR 40.442(3)

As part of the construction of buildings at a contaminated site, the MassDEP Policy for the Construction of Buildings in Contaminated Areas (WSC-00-425) and 310 CMR 40.0442(3) require that a focused site assessment, risk characterization, and feasibility evaluation be included in RAM activities. These should incorporate the concepts and standards specified in the MCP (310 CMR 40.0800 and 40.0900). Site conditions and risks are described below.

4.1 Focused Site Characterization

As discussed in **Section 2.2**, previous investigations were conducted to achieve the Class B-1 RAO that was filed in September 2008. Additional investigations will be conducted prior to construction to characterize subsurface conditions in the areas to be disturbed as part of construction and redevelopment. The proposed investigations will be utilized to support the Focused Site Characterization.

4.2 Focused Risk Characterization

The primary COCs at the Site are benzo(a)pyrene, xylenes, and three metals (nickel, beryllium, and chromium) detected in soil. Potential human receptors include construction and utility workers under current and possible future uses, as well as commercial occupants and residents (including children) under future uses. Possible trespassers and construction workers are also potential human receptors during the planned construction activities. The potential pathways to exposure from contaminated soil include direct contact and inhalation of fugitive dust.

A condition of No Significant Risk (NSR) to human health is expected under current uses (i.e., during construction activities) because:

- Construction workers will follow the HASP prepared by the contractor to reduce potential exposure to these contaminants.
- Management of metals and PAH contamination is often required during construction activities in urban areas, and associated safe practices are well established.
- Soil not suitable for reuse on-Site or designated as contaminated soil will be excavated and transported off-Site to a landfill or other applicable licensed disposal/recycling facility.
- The contractor will perform dust monitoring in the work zone and at the Site perimeter during excavation for the health and safety of construction workers and surrounding receptors.

A condition of NSR to human health is expected under reasonably foreseeable future uses because contaminated soil will be excavated and removed from the Site and groundwater will not be used (e.g., as a source of potable water) in the future. F.W. Webb/AEG anticipates that a risk characterization that accounts for soils to remain on-Site with residual contaminant concentrations will conclude that a condition of NSR will exist.

4.3 Focused Remedial Program

A focused remedial program is planned as part of the construction at the Site to reduce unnecessary risks to construction workers and surrounding populations. These procedures are described in **Sections 3.2 through 3.5** and include requirements for a worker HASP, dust control, and soil stockpiling. The work will generally be staged such that the contaminated soil is handled as little, and by as few contractors, as is practicable.

4.4 Focused Feasibility Study

Contaminated soil will be removed from across the Site, and remaining contaminant concentrations are anticipated to achieve or approach background levels. Construction at the Site will not impede or preclude future investigations or response actions, if necessary.

5.0 Limitations

All work product and reports provided F.W. Webb/AEG in connection with the performance of this investigation are subject to the following limitations:

1. The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely upon the services described herein, and not on scientific tasks or procedures beyond the Scope of described Services provided to the Client.
2. In preparing this report, F.W. Webb/AEG has relied on certain information provided by state and local officials and information and representations made by other parties referenced herein, and on information contained in the files of state and/or local agencies made available to at the time of this investigation. To the extent that such files are missing, incomplete or were not provided, F.W. Webb/AEG is not responsible. Although there may have been some degree of overlap in the information provided by these various sources, attempts to independently verify the accuracy or completeness of all information reviewed or received during the course of this investigation was not completed.
3. The conclusions and recommendations contained in this report are based in part upon the data from subsurface explorations. The nature and extent of variations between these explorations may not become evident until further explorations are completed. If variations or other latent conditions become evident, it will be necessary to re-evaluate the conclusions and recommendations of this report.
4. Where quantitative laboratory analyses have been conducted by an outside certified laboratory, F.W. Webb/AEG has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these tests.
5. If the conclusions and recommendations contained in this report are based, in part, upon various types of chemical data then the conclusions and recommendations are contingent upon the validity of such data. These data have been reviewed and interpretations made in the report. It should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors.
6. Chemical analyses were performed for specific parameters identified during the course of the investigation, as described in the text. However, it should be noted that testing for all known chemical constituents was not performed. The

- conclusions and recommendations contained in this report are based only upon the chemical constituents for which testing were accomplished.
7. The activities described and opinions included herein are based on information gathered during subsurface Site investigations, which were limited in scope at the time of their performance. The professional opinion provided herein is based on the information described in this report.
 8. The information contained herein was prepared for the use of the Client solely in conjunction with the task description for this assignment. The conclusions and recommendations set forth in this report are based on Site conditions at the time of the investigation. Future studies and findings could change the contents of this report. The professional opinions presented in this report have been developed by using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable environmental engineering consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional opinions included in this report.

TABLES

FIGURES

APPENDIX A

RAM Transmittal Form BWSC-106, Notices to Municipal Officials,
and Certificate of Financial Assurance

APPENDIX B

Remedial Additives Plan – Example

APPENDIX C

Test Pit Excavation Reports

APPENDIX D

Grain Size and Proctor Density Analytical Reports

APPENDIX E

Order of Resource Area Delineation Plan



LEGEND

These standard symbols will be found in the drawing.

- CATCHBASIN ROUND
- CATCH BASIN SQUARE
- DRILL HOLE
- MANHOLE ELECTRIC
- GAS GATE
- GUY POLE
- IRON PIPE
- IRON ROD
- NAIL
- MONITORING WELL
- BOUND
- SIGN 1
- STAKE
- UTILITY POLE
- MANHOLE DRAIN
- MANHOLE SEWER

- G
- S
- D
- E
- O
- 24
- GAS LINE
- SEWER LINE
- DRAIN LINE
- UNDER GROUND ELECTRIC
- OVERHEAD WIRES
- CHAIN LINK FENCE
- CONTOUR EXISTING
- BANK/ MEAN ANNUAL HIGH WATER (A & B SERIES FLAGS)
- 200' RIVERFRONT AREA BUFFER
- BORDERING VEGETATED WETLAND (C & D WETLAND FLAGS)

PLAN NOTES:
No Bordering Land Subject to Flooding on site.
Refer to FIRM map 25017C0557E

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DRAWINGS ISSUED FOR PERMIT APPROVAL

Project Title:
**ANRAD
PARCEL 1234-2-0
0 ARLINGTON STREET
WATERTOWN, MA**

Sheet Title:
ANRAD PLAN

Date:	12/5/2018
Scale:	As Shown
Drawn by:	KH
Checked by:	MM
File #	52275

REVISIONS		
Date:	By:	Note:
01/28/19	TS	INCLUSION OF SAWINS PARCEL
04/02/19	TS	REVISED WETLAND SURVEY
04/18/19	TS	INCLUSION OF 200' RFA BUFFER

Sheet No:

1

NOTES:
WETLAND AND BANK FLAGS, SHOWN HERE,
SURVEYED BY OTTE & DWYER, INC. ON APRIL 2, 2019.

SCALE IN FEET
0 10 20 40

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APPENDIX F
Stormwater Report and Calculations

DRAINAGE CALCULATIONS AND STORMWATER MANAGEMENT PLAN

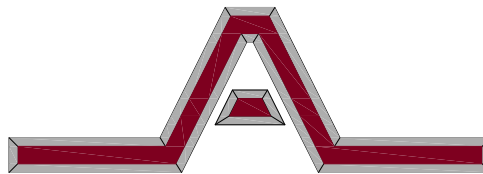
For The
Proposed Mixed Use Building

located at
**Arlington Street & Elm Street
(Parcel ID: 1236 2 0)
Watertown, Massachusetts**

Submitted to:
**Town of Watertown
Conservation Commission
149 Main Street, Third Floor
Watertown, Massachusetts 02472**

Prepared for:
**Maximos Hatziliades
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March 12, 2021

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▪ APPENDIX C	Stormwater Checklist Supplemental BMP Calculations Illicit Discharge Statement
▪ APPENDIX D	BMP Operation and Maintenance Plan
▪ APPENDIX E	NOAA Rainfall Data

**Proposed Mixed Use Building
Arlington Street & Elm Street
Watertown, Massachusetts 02472**

Project Description

The project proponent proposes to construct a two-story mixed-use building on a 1.42± acre parcel of land located on Arlington Street in Watertown, MA (Parcel ID: 1236 2 0). The proposed structure consists of a 7,150 s.f. footprint which will consist of 3,500 s.f. of retail and 3,650 s.f. of warehouse on the first floor, and 7,150 s.f. of warehouse on the second floor. Nineteen (19) Exterior surface parking spaces will be provided on site for the proposed development. The property abuts Elm Street to the west, Arlington Street to the east, and commercial land to the north and south.

The property will have access driveways on both Elm Street and Arlington Street. One-way entry will be provided via a sixteen-foot (16') driveway from Elm Street. Two-way entry will be provided via a twenty-four-foot (24') driveway from Arlington Street. Vehicles will only be permitted to exit the property onto Arlington Street.

A large portion of the subject parcel is occupied by bordering vegetated wetland (BVW) and land under water. As part of the project work, 4,215 s.f. of bordering vegetated wetland will be impacted. A total of 6,930 s.f. of BVW will be constructed on the southern portion of the parcel to mitigate for the impacts. No work will occur within the area classified as land under water.

An existing 24" culvert enters the property from Elm Street discharging to the bordering vegetated wetland located on site. The headwall for the culvert entrance is currently in disrepair. The proposed project includes the demolition of the existing concrete headwall, the installation of a water quality structure at the discharge point between the existing culvert and the bordering vegetated wetland, and the construction of a new concrete headwall within the wetland replication area.

Existing Conditions

The Williams parcel is located in a mixed industrial, commercial, and residential area of Watertown and is currently vacant and wooded with approximately 7,930 s.f. of BVW present in association with a perennial stream, locally referred to as Williams Brook. Four (4) culverts currently existing on site, two entering from Elm Street (24" and 72") and two existing toward Arlington Street (4'x6' and 72"). The existing 24" culvert discharges into the bordering vegetated wetland through a headwall that is currently in disrepair.

The entirety of the subject parcel slopes inward from the surrounding area to the area classified as land under water. Elevations range from 24 (+/-) at the parcel perimeter down to 10 (+/-) at the discharge point (6' culvert to Arlington Street).

The drainage calculations were performed using the computer program HydroCAD 10.10 by Applied Microcomputer Systems based upon Technical Release 20 (TR-20), developed by the SCS. Drainage calculations for the Existing Conditions were prepared for the 2, 10, 25 & 100-year Type III 24-hour storm events. Rainfall depths were obtained from the National Oceanic and Atmospheric Administration for the town of Watertown. The SCS Hydrologic Soil Groups were employed to develop weighted runoff curve numbers for all drainage areas. The site consists entirely of wooded and wetland area. Hydrologic Soil Group "C" was assumed for all wooded surfaces. Hydrologic Soil Group "D" was assumed for all wetland areas. The calculations and hydrographs generated for the area for the Existing Conditions are located in Appendix A.

The Existing Conditions drainage analysis is comprised of one (1) watershed area that drains via surface flow to 6' wide culvert within the area classified as land under water (DP-1), as illustrated on Sheet EWP entitled Existing Watershed Plan. The on-site runoff that does not infiltrate discharges through the culvert and offsite.

A summary of the peak rate of runoff for Existing Watershed #1 is as follows:

Existing Conditions Drainage Summary

	2-Year Storm (3.25 in.)	10-Year Storm (5.13 in.)	25-Year Storm (6.31 in.)	100-Year Storm (8.12 in.)
Design Point #1	2.21 cfs	4.49 cfs	5.96 cfs	8.23 cfs

Proposed Conditions

In the proposed condition, the aforementioned mixed use building would be constructed. Construction of the building, driveways, parking area and landscaping would disrupt a portion of the site including 4,212 s.f. of existing bordering vegetated wetland area. A number of measures are proposed to mitigate the impact of the increase in impervious area and disturbance to the existing bordering vegetated wetland that include: 6,750 s.f. of wetland replication around the perimeter of the existing bordering vegetated wetland, the implementation of a porous asphalt throughout the driveway and parking area, and the installation of a subsurface infiltration facility to mitigate roof runoff from the proposed building.

Surface runoff from the proposed developed portion of the property will drain via surface flow to the porous asphalt parking area (P1). The porous asphalt parking area includes an eighteen inch (18") crushed stone bed that has been sized to accommodate all storms up to and including the 100-year storm event. Additionally, treebox filters have been proposed at low points within the porous asphalt parking area as emergency overflow spillways in the event of extreme storm events or failure of the porous asphalt. The treebox filter underdrains will discharge to an overflow manhole and ultimately through an overflow pipe daylighting beyond the proposed retaining wall along the parking area.

The proposed building will drain via roof drain into a subsurface infiltration facility consisting of two (2) rows of ten (10) Cultec 330XLHD chambers encased in crushed stone (P2). The subsurface infiltration facility has been sized to accommodate all storms up to and including the 25-year storm event. In the 100-year storm event, stormwater will discharge through an outlet control structure with a weir to the overflow manhole and ultimately through the overflow pipe daylighting beyond the proposed retaining wall along the parking area.

The design points for the post-development condition correspond to the pre-development condition. Proposed Watershed #1A consists of the driveway and parking area, retaining walls, and landscaped area. Proposed Watershed #1B consists of the building roof area. Proposed Watershed #1C consists of the wetland area (existing and replication), the existing stream, and the remaining undisturbed wooded area.

As in the pre-development condition, drainage calculations were performed by the SCS TR-20 Methods for the 2, 10, 25 and 100-year Type III storm events. Refer to the HydroCAD model for computer results.

This development project is subject to the Stormwater Management Standards, as set forth by the Massachusetts Department of Environmental Protection (MassDEP). Compliance with these standards is documented on the "Stormwater Checklist" and in the calculations for Standards 3 and 4, attached in Appendix C.

Proposed Conditions Drainage Summary

	2-Year Storm (3.25 in.)	10-Year Storm (5.13 in.)	25-Year Storm (6.31 in.)	100-Year Storm (8.12 in.)
Design Point #1	1.56 cfs	3.06 cfs	4.01 cfs	6.69 cfs

Stormwater Management Facilities

The stormwater facilities were designed to attenuate peak flows generated by all storm events up to an including the 100-year storm event. An infiltration rate of 1.02 in/hr was used based on the Rawls Rate of saturated hydraulic conductivity for a sandy loam soil type. The proposed facilities were analyzed using the SCS TR-20 computer program. Refer to Appendix A & B for the Stage Storage Curves and TR-20 computer results for the storage characteristics of the subsurface facility. Refer to the Proposed Site Plans for details on the design of the stormwater management facilities.

Erosion and Siltation Control

Rows of hay bales and siltation fence will be placed at the downhill limit of work and existing catch basins will be equipped with silt sacks prior to the commencement of any construction activity. The integrity of the hay bales, silt fence, and silt sacks will be maintained by periodic inspection and replacement as necessary. The hay bales, silt fence, and silt sacks will remain in place until the first course of pavement has been placed and all side slopes have been loamed and seeded and vegetation has been established.



PREPARED BY:



Engineering Alliance, Inc.
 Civil Engineering & Land Planning Consultants
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 Tel: (781) 231-1349
 Fax: (781) 417-0020

1950 Lafayette Road
 Portsmouth, NH 03801
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 Fax: (603) 610-7101

PROJECT:

Plan of Land
 Arlington Street & Elm Street
 (Tax Map 1236 Block 2 Lot 0)
 Watertown, MA 02472

PROJECT: 09-27801

SCALE: 1:25,000

DESIGNED BY: Calvin Reach

DATE: October 5, 2020

DWG FILE NAME: Figures.dwg

CHECKED BY: Richard A. Salvo, P.E.

DRAWING TITLE:

FIGURE 1 - USGS LOCUS MAP

Page #:

1 of 5



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FIGURE 2 - ORTHO PHOTO

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2 of 5



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SCALE: 1"=500'

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FIGURE 3 - FEMA FLOOD MAP

Page #:

3 of 5



LEGEND:

-  - NHESP ESTIMATED HABITATS OF RARE SPECIES
-  - NHESP PRIORITY HABITATS OF RARE SPECIES
-  - NHESP CERTIFIED VERNAL POOLS

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PROJECT:

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 (Tax Map 1236 Block 2 Lot 0)
 Watertown, MA 02472

PROJECT: 09-27801

DATE: October 5, 2020

SCALE: 1:25,000

DWG FILE NAME: Figures.dwg

DESIGNED BY: Calvin Reach

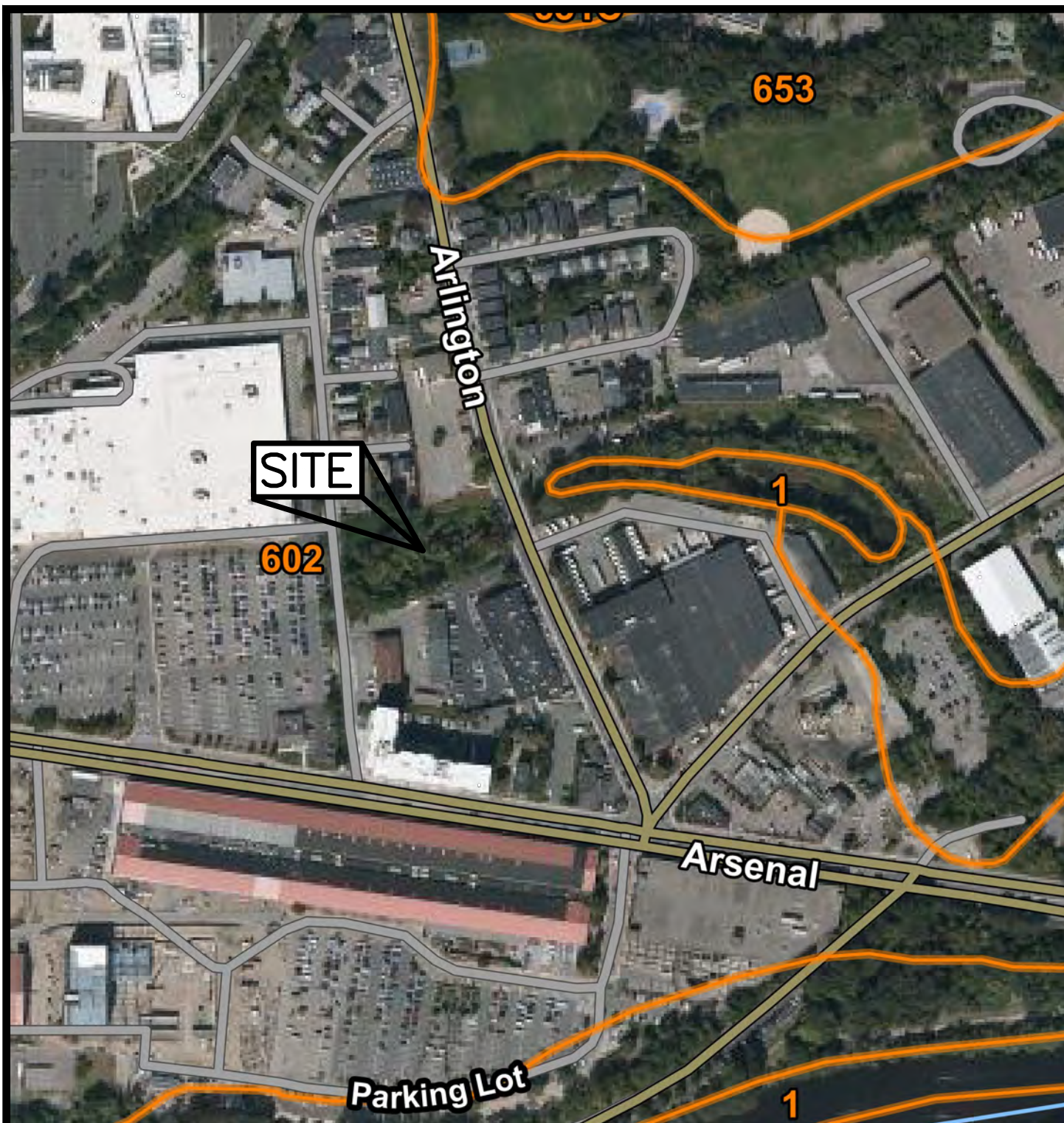
CHECKED BY: Richard A. Salvo, P.E.

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FIGURE 4 - NATURAL HERITAGE MAP

Page #:

4 of 5



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PROJECT:

Plan of Land
 Arlington Street & Elm Street
 (Tax Map 1236 Block 2 Lot 0)
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PROJECT: 09-27801

DATE: October 5, 2020

SCALE: 1"=300'

DWG FILE NAME: Figures.dwg

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CHECKED BY: Richard A. Salvo, P.E.

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FIGURE 5 - SOILS MAP

Page #:

5 of 5

Agawam

Percent of map unit: 2 percent

Landform: Moraines, outwash terraces, outwash plains, kames, eskers, stream terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

602—Urban land

Map Unit Setting

National map unit symbol: 9950

Elevation: 0 to 3,000 feet

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 110 to 200 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Excavated and filled land

Minor Components

Rock outcrop

Percent of map unit: 5 percent

Landform: Ledges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Head slope

Down-slope shape: Concave

Across-slope shape: Concave

Udorthents, wet substratum

Percent of map unit: 5 percent

Hydric soil rating: No

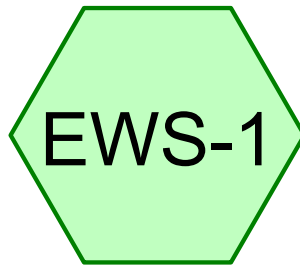
Udorthents, loamy

Percent of map unit: 5 percent

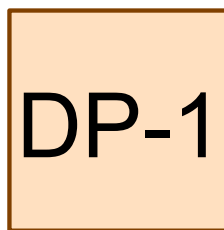
Hydric soil rating: No

APPENDIX A

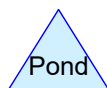
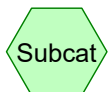
Existing Conditions Drainage Calculations Existing Watershed Plan



Existing Waterhshed 1



Culvert



Existing Conditions

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Page 2

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year Storm	Type III 24-hr		Default	24.00	1	3.25	2
2	10-Year Storm	Type III 24-hr		Default	24.00	1	5.13	2
3	25-Year Storm	Type III 24-hr		Default	24.00	1	6.31	2
4	100-Year Storm	Type III 24-hr		Default	24.00	1	8.12	2

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Page 3

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
7,932	98	Land Under Water (EWS-1)
20,239	83	Wetlands, HSG D (EWS-1)
33,540	77	Woods, Poor, HSG C (EWS-1)
61,711	82	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
33,540	HSG C	EWS-1
20,239	HSG D	EWS-1
7,932	Other	EWS-1
61,711		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchm Numbers
0	0	0	0	7,932	7,932	Land Under Water	
0	0	0	20,239	0	20,239	Wetlands	
0	0	33,540	0	0	33,540	Woods, Poor	
0	0	33,540	20,239	7,932	61,711	TOTAL AREA	

Existing Conditions

Type III 24-hr 2-Year Storm Rainfall=3.25"

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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 EWS-1: Existing Watershed Runoff Area=61,711 sf 12.85% Impervious Runoff Depth=1.58"
Flow Length=421' Tc=10.7 min CN=82 Runoff=2.21 cfs 8,101 cf

Reach DP-1: Culvert

Inflow=2.21 cfs 8,101 cf

Outflow=2.21 cfs 8,101 cf

Total Runoff Area = 61,711 sf Runoff Volume = 8,101 cf Average Runoff Depth = 1.58"
87.15% Pervious = 53,779 sf 12.85% Impervious = 7,932 sf

Existing Conditions

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Type III 24-hr 2-Year Storm Rainfall=3.25"

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Page 7

Summary for Subcatchment EWS-1: Existing Waterhsed 1

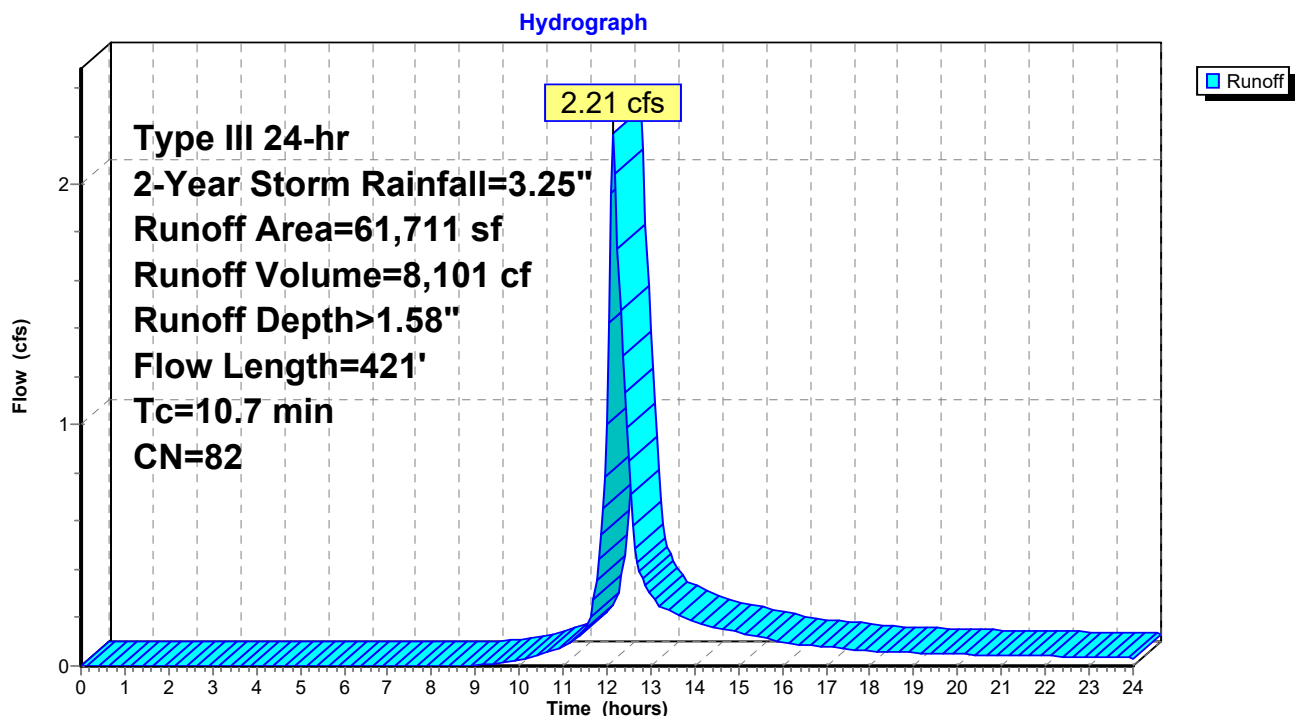
Runoff = 2.21 cfs @ 12.16 hrs, Volume= 8,101 cf, Depth> 1.58"

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 Storm Rainfall=3.25"

Area (sf)	CN	Description
33,540	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 20,239	83	Wetlands, HSG D
61,711	82	Weighted Average
53,779		87.15% Pervious Area
7,932		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

Subcatchment EWS-1: Existing Waterhsed 1



Existing Conditions

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Type III 24-hr 2-Year Storm Rainfall=3.25"

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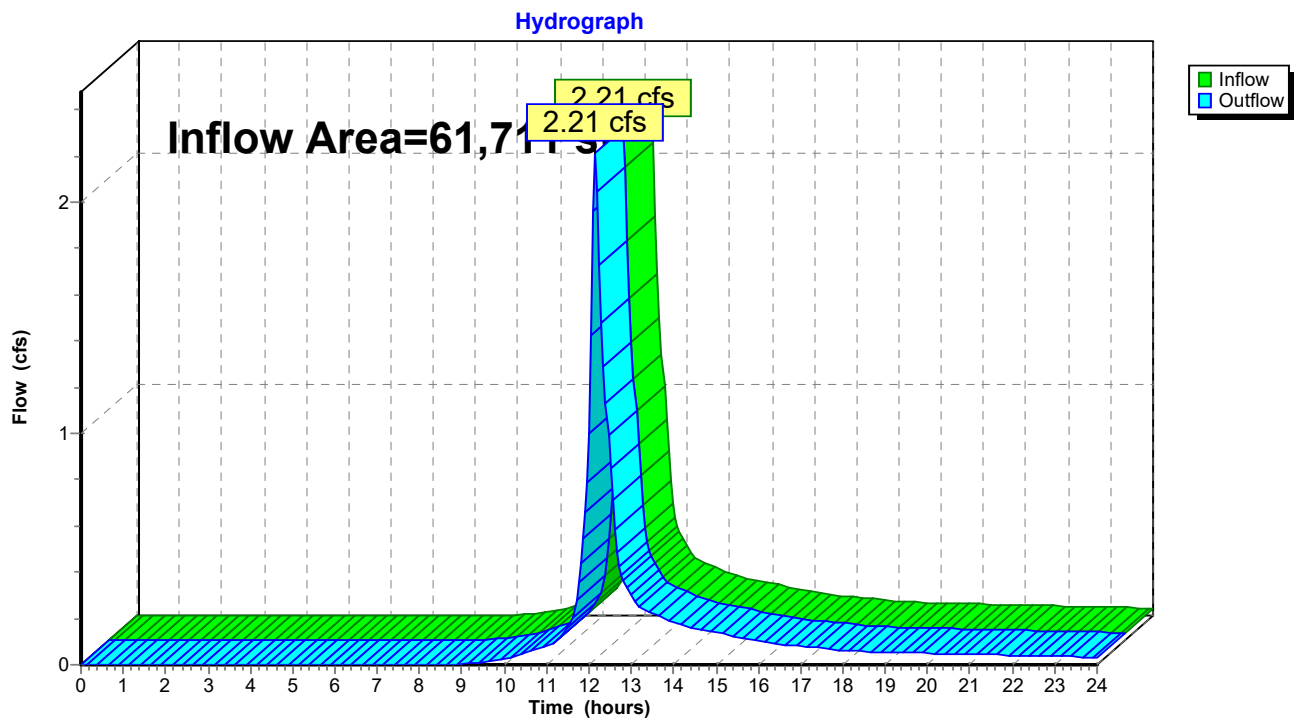
Page 8

Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 12.85% Impervious, Inflow Depth > 1.58" for 2-Year Storm event
Inflow = 2.21 cfs @ 12.16 hrs, Volume= 8,101 cf
Outflow = 2.21 cfs @ 12.16 hrs, Volume= 8,101 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert



Existing Conditions

Type III 24-hr 10-Year Storm Rainfall=5.13"

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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 EWS-1: Existing Watershed Runoff Area=61,711 sf 12.85% Impervious Runoff Depth=3.19"
Flow Length=421' Tc=10.7 min CN=82 Runoff=4.49 cfs 16,405 cf

Reach DP-1: Culvert

Inflow=4.49 cfs 16,405 cf

Outflow=4.49 cfs 16,405 cf

Total Runoff Area = 61,711 sf Runoff Volume = 16,405 cf Average Runoff Depth = 3.19"
87.15% Pervious = 53,779 sf 12.85% Impervious = 7,932 sf

Existing Conditions

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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Summary for Subcatchment EWS-1: Existing Waterhsed 1

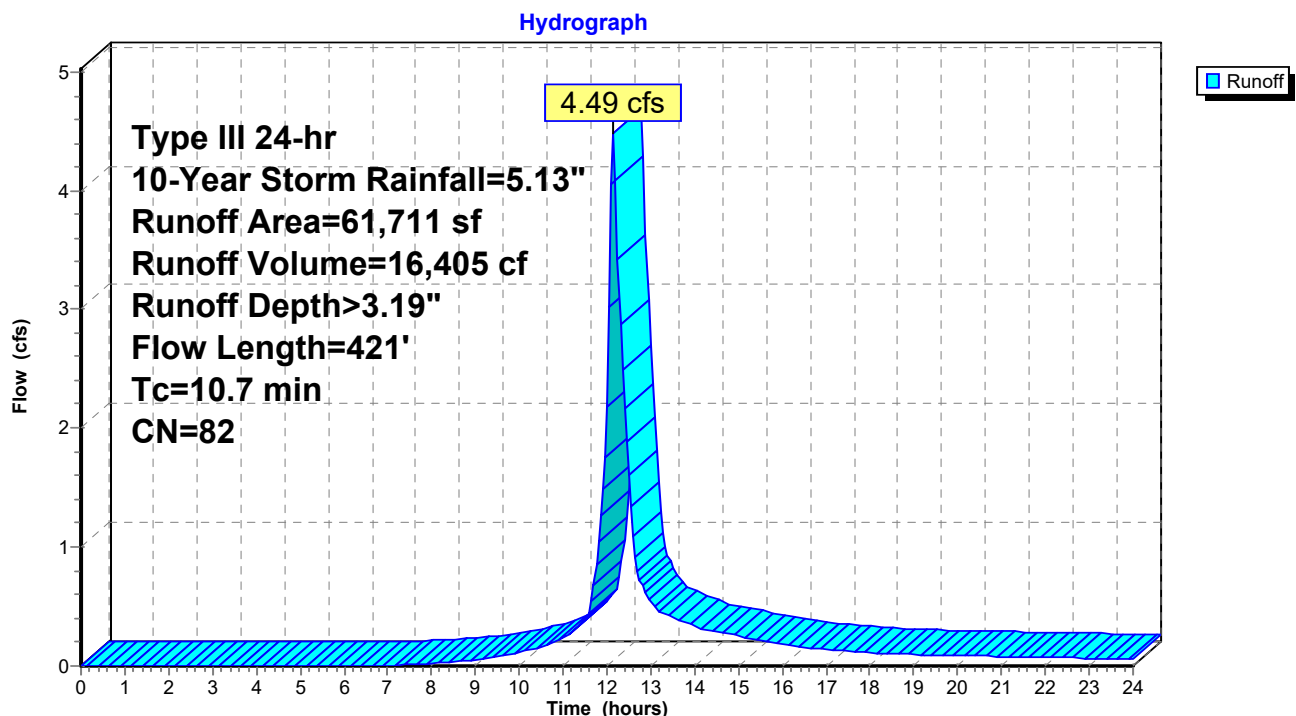
Runoff = 4.49 cfs @ 12.15 hrs, Volume= 16,405 cf, Depth> 3.19"

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 Storm Rainfall=5.13"

Area (sf)	CN	Description
33,540	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 20,239	83	Wetlands, HSG D
61,711	82	Weighted Average
53,779		87.15% Pervious Area
7,932		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

Subcatchment EWS-1: Existing Waterhsed 1



Existing Conditions

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Type III 24-hr 10-Year Storm Rainfall=5.13"

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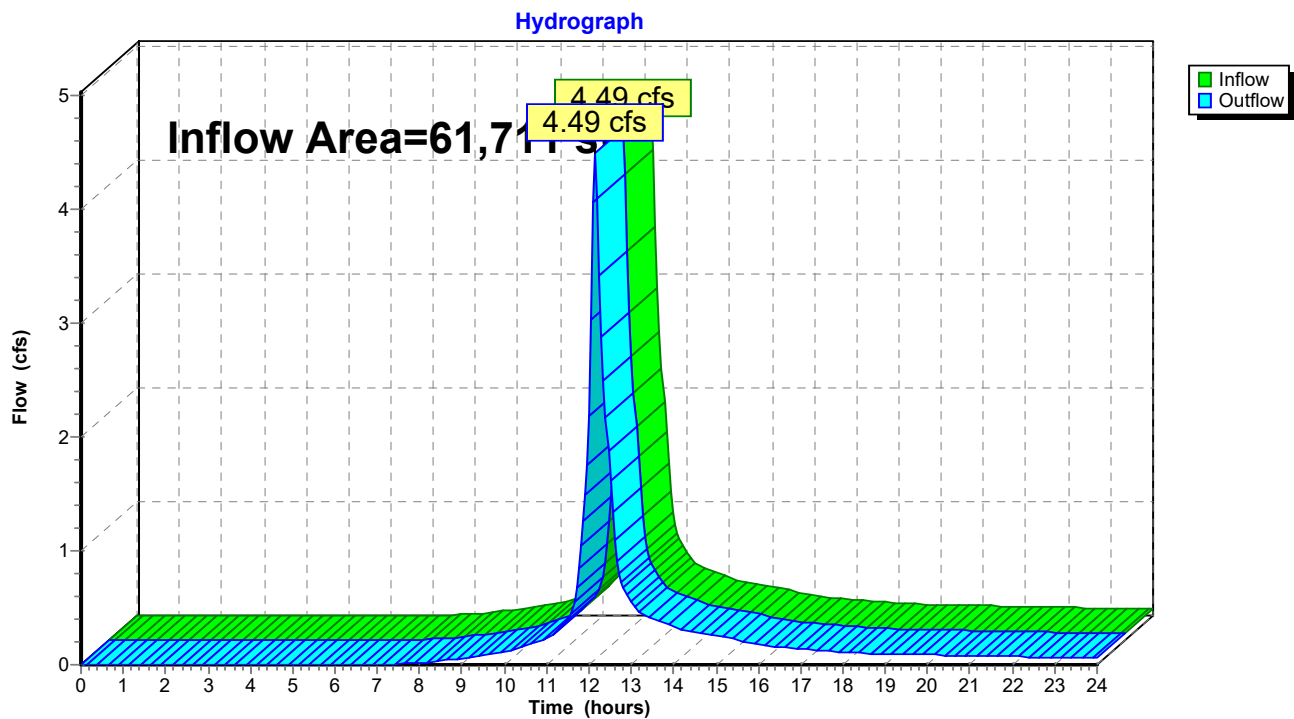
Page 11

Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 12.85% Impervious, Inflow Depth > 3.19" for 10-Year Storm event
Inflow = 4.49 cfs @ 12.15 hrs, Volume= 16,405 cf
Outflow = 4.49 cfs @ 12.15 hrs, Volume= 16,405 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert



Existing Conditions

Type III 24-hr 25-Year Storm Rainfall=6.31"

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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 EWS-1: Existing Watershed Runoff Area=61,711 sf 12.85% Impervious Runoff Depth=4.27"
Flow Length=421' Tc=10.7 min CN=82 Runoff=5.96 cfs 21,939 cf

Reach DP-1: Culvert

Inflow=5.96 cfs 21,939 cf

Outflow=5.96 cfs 21,939 cf

Total Runoff Area = 61,711 sf Runoff Volume = 21,939 cf Average Runoff Depth = 4.27"
87.15% Pervious = 53,779 sf 12.85% Impervious = 7,932 sf

Existing Conditions

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Type III 24-hr 25-Year Storm Rainfall=6.31"

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Summary for Subcatchment EWS-1: Existing Waterhsed 1

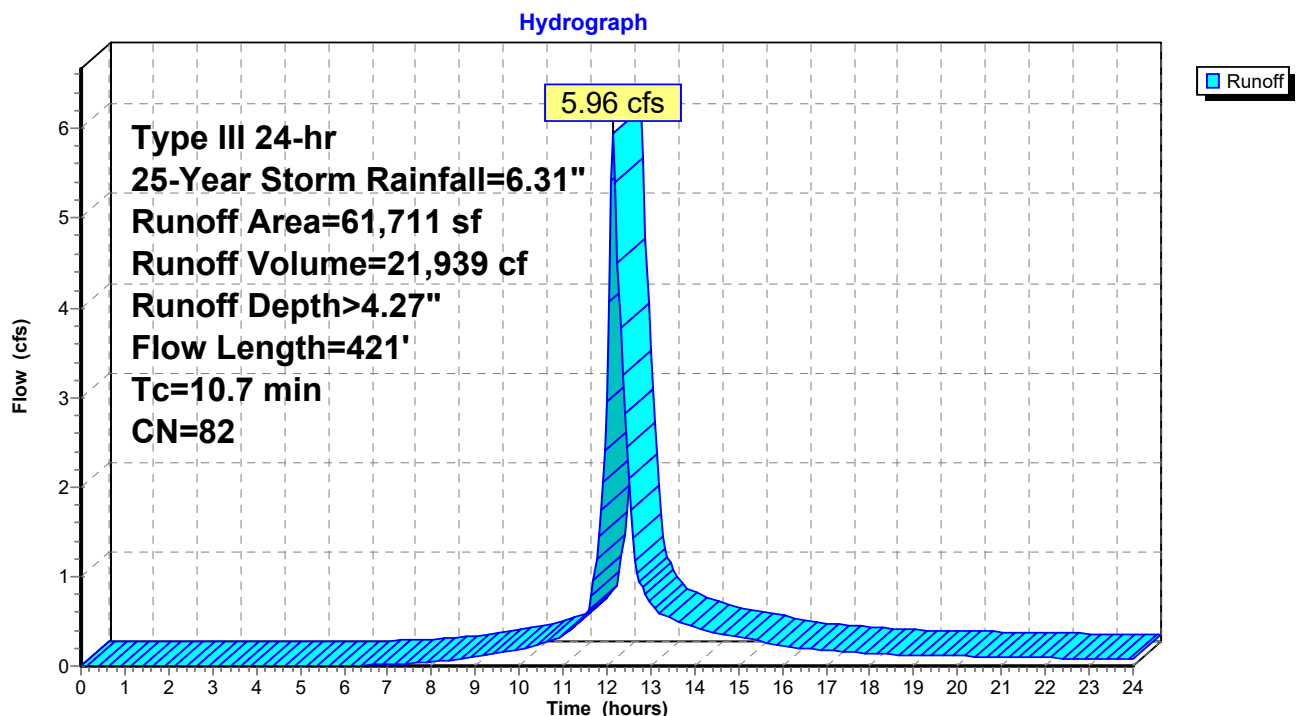
Runoff = 5.96 cfs @ 12.15 hrs, Volume= 21,939 cf, Depth> 4.27"

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 25-Year Storm Rainfall=6.31"

Area (sf)	CN	Description
33,540	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 20,239	83	Wetlands, HSG D
61,711	82	Weighted Average
53,779		87.15% Pervious Area
7,932		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

Subcatchment EWS-1: Existing Waterhsed 1



Existing Conditions

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Type III 24-hr 25-Year Storm Rainfall=6.31"

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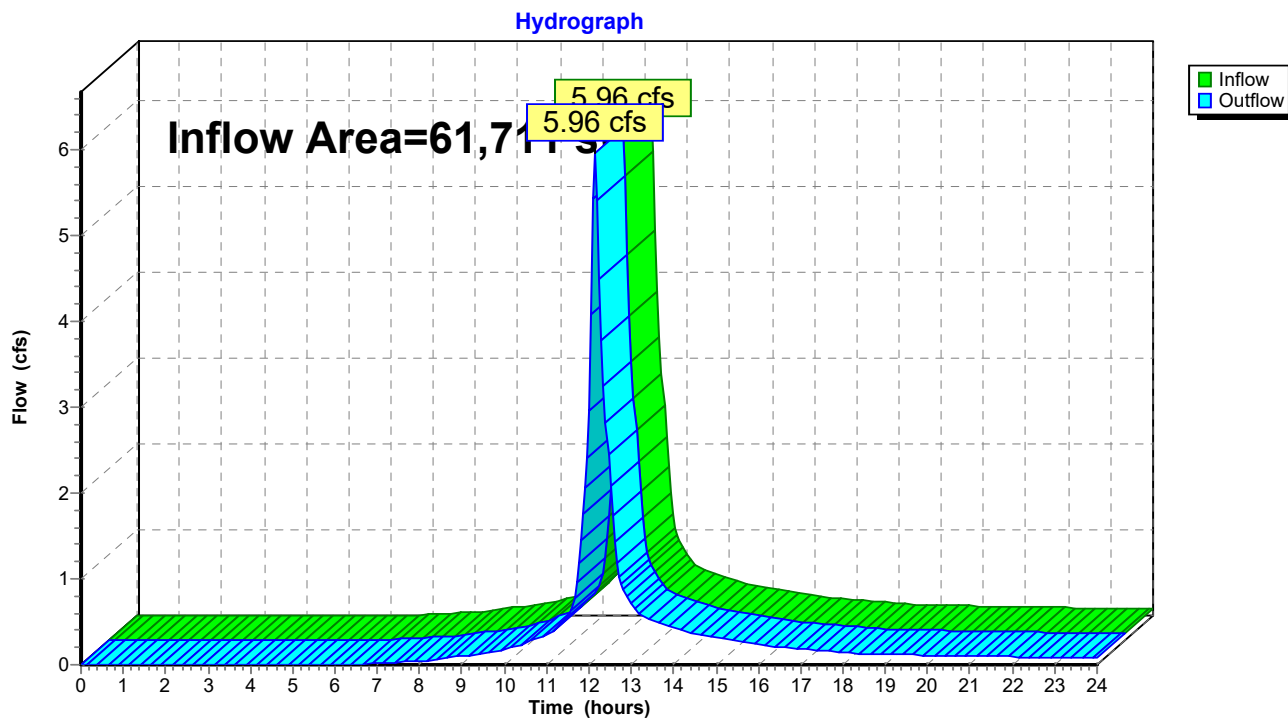
Page 14

Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 12.85% Impervious, Inflow Depth > 4.27" for 25-Year Storm event
Inflow = 5.96 cfs @ 12.15 hrs, Volume= 21,939 cf
Outflow = 5.96 cfs @ 12.15 hrs, Volume= 21,939 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert



Existing Conditions

Type III 24-hr 100-Year Storm Rainfall=8.12"

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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 EWS-1: Existing Watershed Runoff Area=61,711 sf 12.85% Impervious Runoff Depth=5.96"
Flow Length=421' Tc=10.7 min CN=82 Runoff=8.23 cfs 30,673 cf

Reach DP-1: Culvert

Inflow=8.23 cfs 30,673 cf

Outflow=8.23 cfs 30,673 cf

Total Runoff Area = 61,711 sf Runoff Volume = 30,673 cf Average Runoff Depth = 5.96"
87.15% Pervious = 53,779 sf 12.85% Impervious = 7,932 sf

Existing Conditions

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Type III 24-hr 100-Year Storm Rainfall=8.12"

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Summary for Subcatchment EWS-1: Existing Waterhsed 1

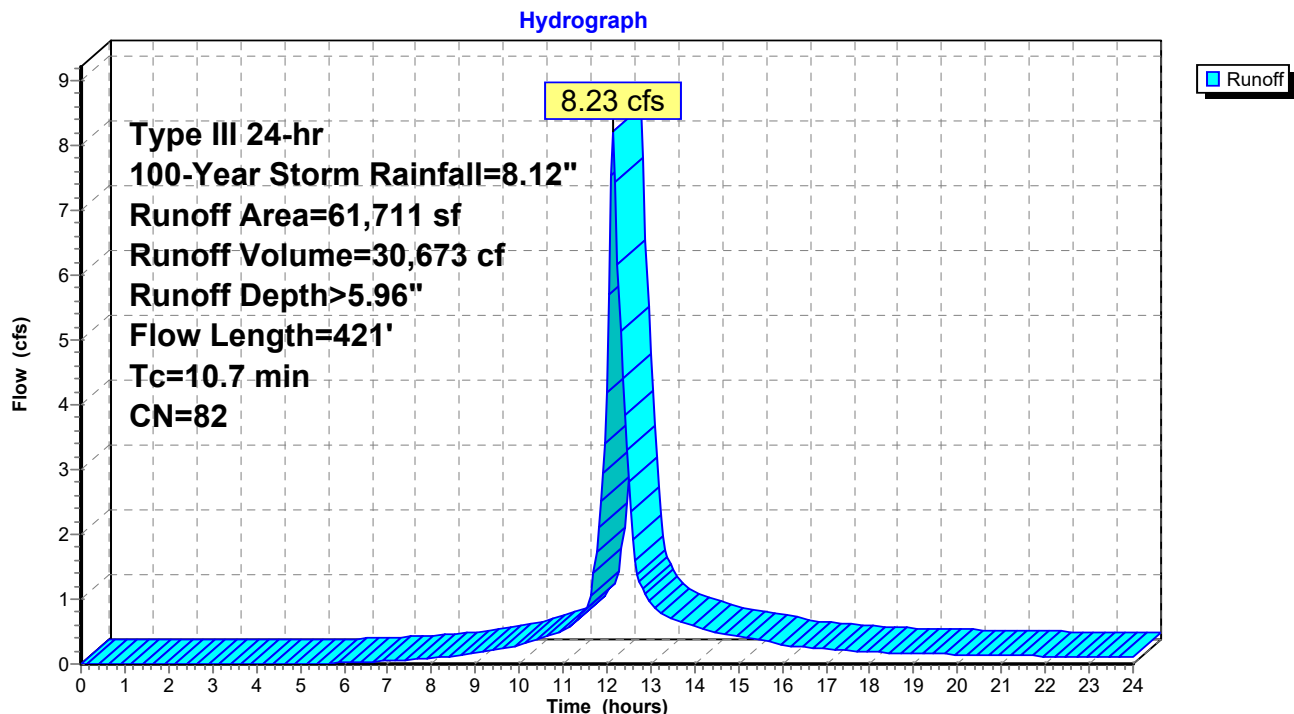
Runoff = 8.23 cfs @ 12.15 hrs, Volume= 30,673 cf, Depth> 5.96"

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 Storm Rainfall=8.12"

Area (sf)	CN	Description
33,540	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 20,239	83	Wetlands, HSG D
61,711	82	Weighted Average
53,779		87.15% Pervious Area
7,932		12.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

Subcatchment EWS-1: Existing Waterhsed 1



Existing Conditions

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Type III 24-hr 100-Year Storm Rainfall=8.12"

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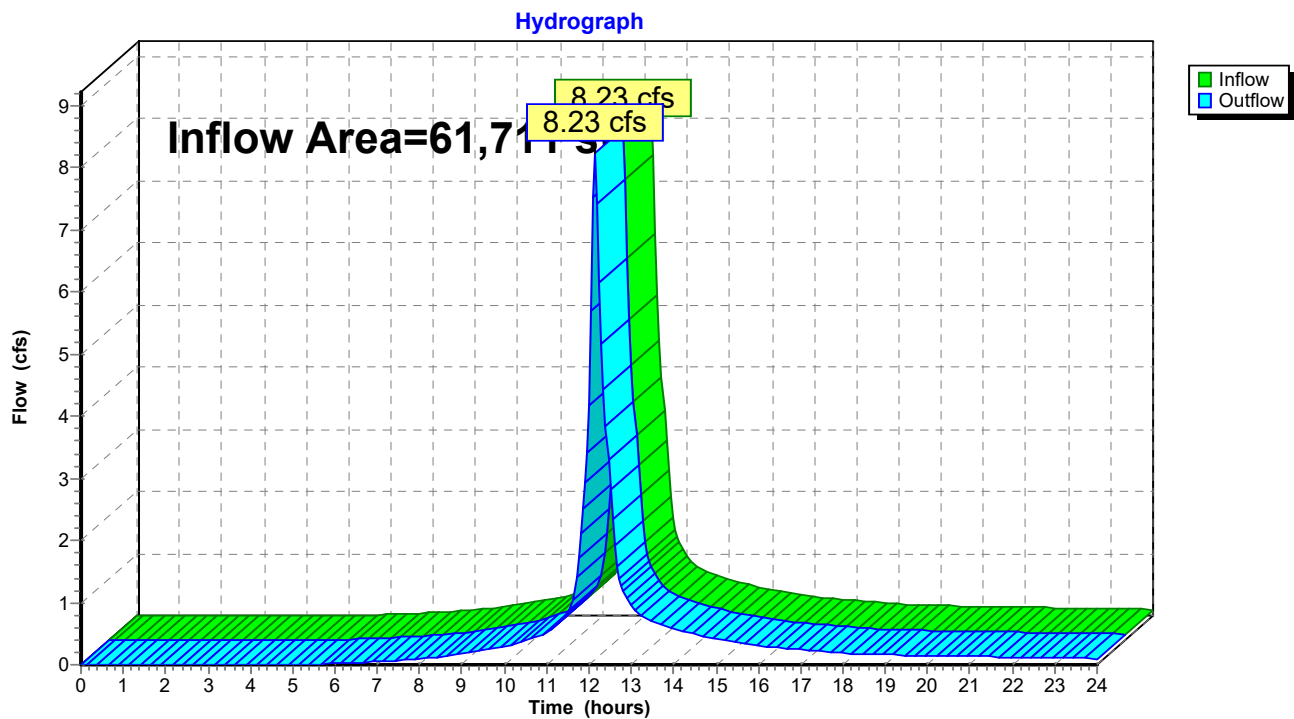
Page 17

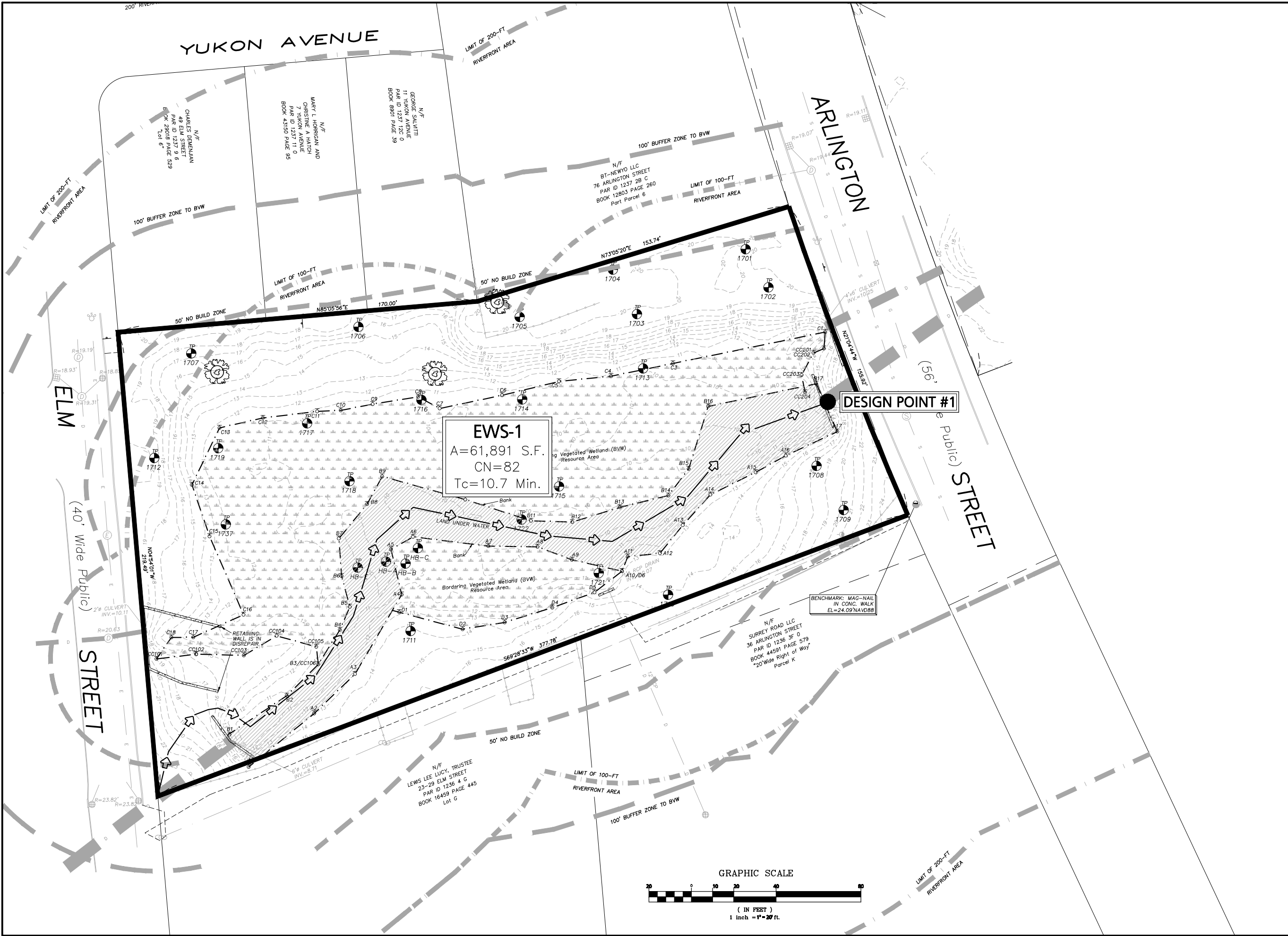
Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 12.85% Impervious, Inflow Depth > 5.96" for 100-Year Storm event
Inflow = 8.23 cfs @ 12.15 hrs, Volume= 30,673 cf
Outflow = 8.23 cfs @ 12.15 hrs, Volume= 30,673 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert

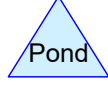
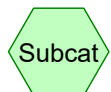
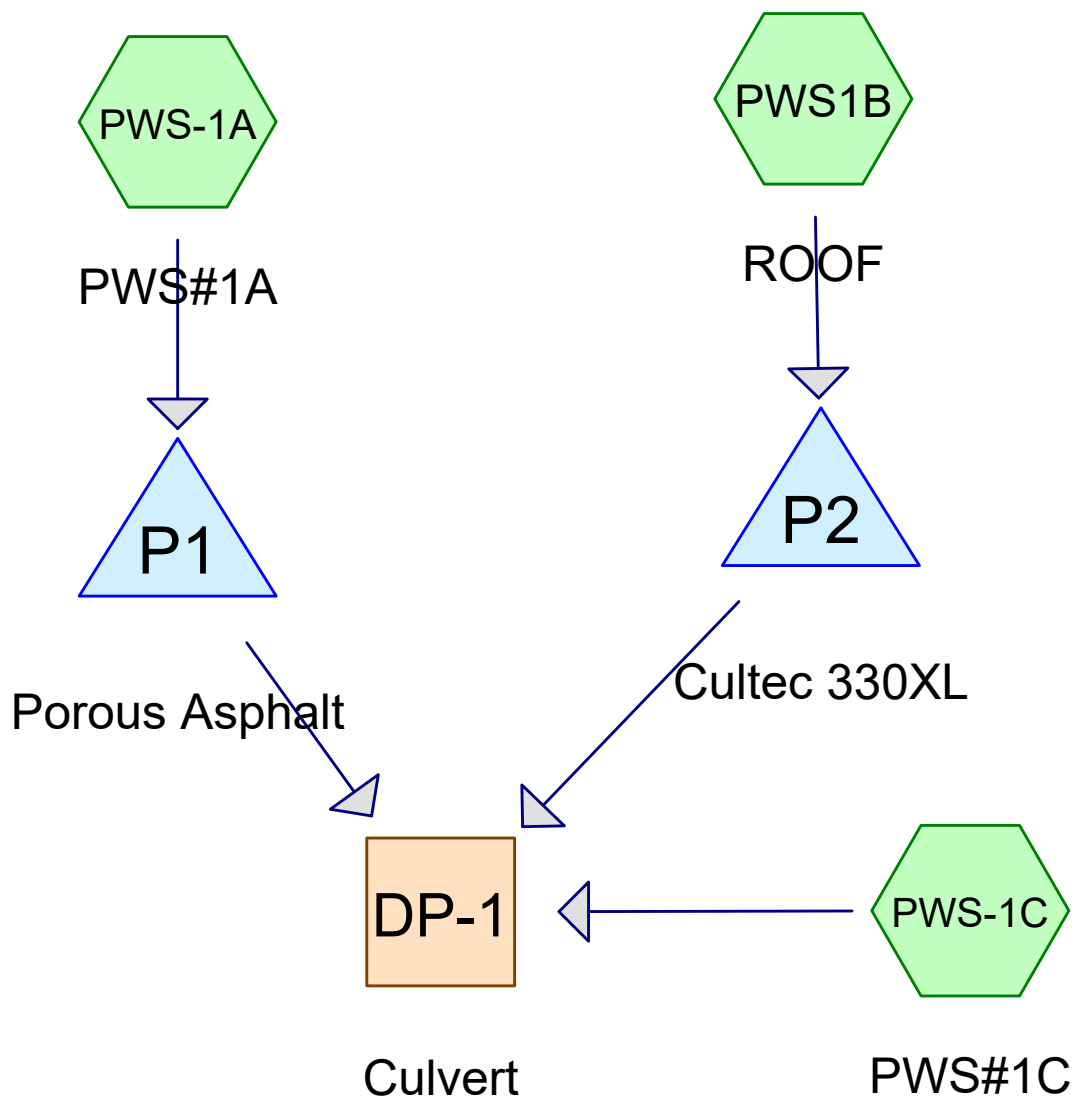




APPLICANT:	Maximos Hatziliades 71 Arlington Street Watertown, MA 02472	
	DWG. NO. EWS	
PROJECT:	Proposed Site Plan Arlington Street & Elm Street (Parcel ID: 1236 2 0) Watertown, Massachusetts	
	PROJECT #: 09-27801 SCALE: As Noted DESIGN BY: Calvin Reach	
PREPARED BY:	Engineering Alliance, Inc. Civil Engineering & Land Planning Consultants 194 Central Street Salem, MA 01906 Tel: (508) 231-1349 Fax: (508) 417-0020	
	DATE	
DESCRIPTION OF REVISION		

APPENDIX B

Proposed Conditions Drainage Calculations Proposed Watershed Plan



Routing Diagram for Proposed Conditions
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year Storm	Type III 24-hr		Default	24.00	1	3.25	2
2	10-Year Storm	Type III 24-hr		Default	24.00	1	5.13	2
3	25-Year Storm	Type III 24-hr		Default	24.00	1	6.31	2
4	100-Year Storm	Type III 24-hr		Default	24.00	1	8.12	2

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
4,839	74	>75% Grass cover, Good, HSG C (PWS-1A, PWS-1C)
104	98	Concrete Sidewalk, HSG C (PWS-1A, PWS-1C)
7,932	98	Land Under Water (PWS-1C)
360	98	Modular Block Retaining Walls, HSG (PWS-1A)
11,122	98	Paved parking, HSG C (PWS-1A)
7,185	98	Roofs, HSG C (PWS1B)
340	98	Vertical Granite Curbing, HSG C (PWS-1A)
22,777	83	Wetlands, HSG D (PWS-1C)
7,052	77	Woods, Poor, HSG C (PWS-1C)
61,711	88	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
30,642	HSG C	PWS-1A, PWS-1C, PWS1B
22,777	HSG D	PWS-1C
8,292	Other	PWS-1A, PWS-1C
61,711		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	4,839	0	0	4,839	>75% Grass cover, Good
0	0	104	0	0	104	Concrete Sidewalk
0	0	0	0	7,932	7,932	Land Under Water
0	0	0	0	360	360	Modular Block Retaining Walls
0	0	11,122	0	0	11,122	Paved parking
0	0	7,185	0	0	7,185	Roofs
0	0	340	0	0	340	Vertical Granite Curbing
0	0	0	22,777	0	22,777	Wetlands
0	0	7,052	0	0	7,052	Woods, Poor
0	0	30,642	22,777	8,292	61,711	TOTAL AREA

Proposed Conditions*Type III 24-hr 2-Year Storm Rainfall=3.25"*

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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 PWS-1A: PWS#1A

Runoff Area=14,725 sf 80.64% Impervious Runoff Depth>2.49"
Tc=5.0 min CN=93 Runoff=0.96 cfs 3,058 cf

Subcatchment PWS-1C: PWS#1C

Runoff Area=39,801 sf 20.06% Impervious Runoff Depth>1.72"
Flow Length=421' Tc=10.7 min CN=84 Runoff=1.56 cfs 5,708 cf

Subcatchment PWS1B: ROOF

Runoff Area=7,185 sf 100.00% Impervious Runoff Depth>3.02"
Tc=5.0 min CN=98 Runoff=0.52 cfs 1,806 cf

Reach DP-1: Culvert

Inflow=1.56 cfs 5,708 cf
Outflow=1.56 cfs 5,708 cf

Pond P1: Porous Asphalt

Peak Elev=17.64' Storage=609 cf Inflow=0.96 cfs 3,058 cf
Discarded=0.27 cfs 3,056 cf Primary=0.00 cfs 0 cf Outflow=0.27 cfs 3,056 cf

Pond P2: Cultec 330XL

Peak Elev=16.06' Storage=858 cf Inflow=0.52 cfs 1,806 cf
Discarded=0.03 cfs 1,511 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,511 cf

Total Runoff Area = 61,711 sf Runoff Volume = 10,572 cf Average Runoff Depth = 2.06"
56.18% Pervious = 34,668 sf 43.82% Impervious = 27,043 sf

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Type III 24-hr 2-Year Storm Rainfall=3.25"

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Summary for Subcatchment PWS-1A: PWS#1A

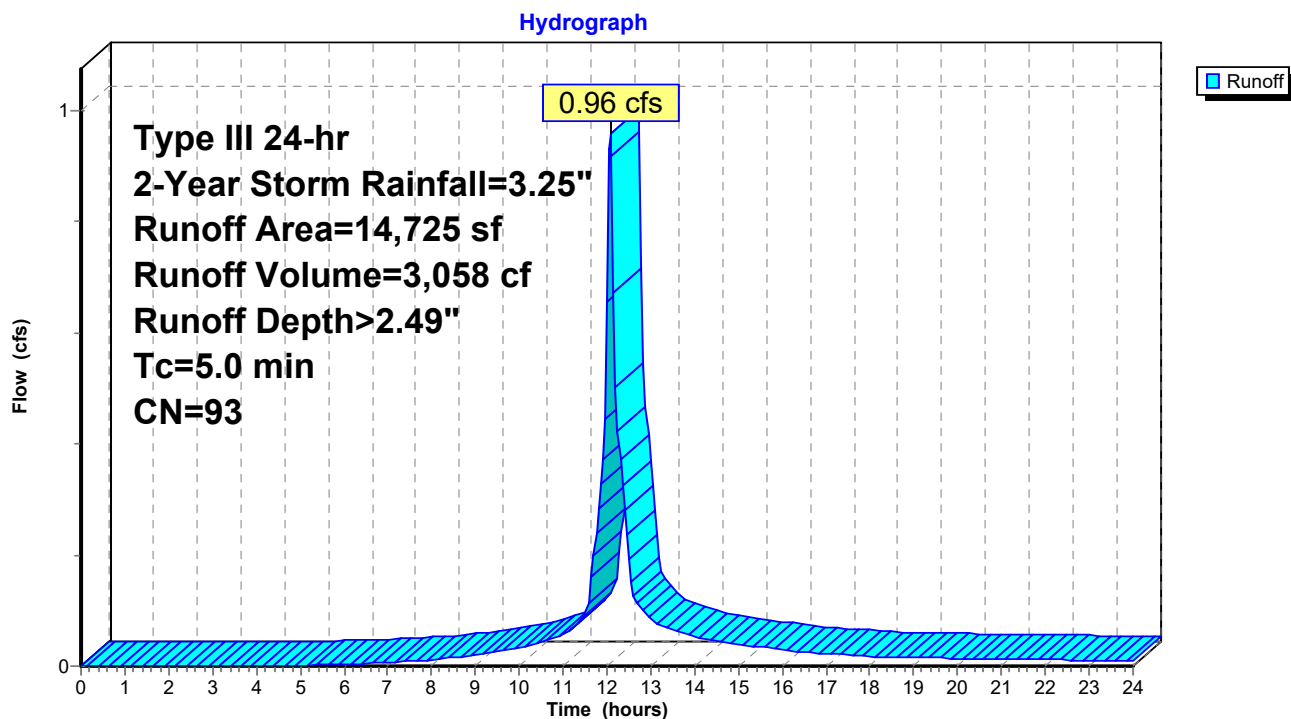
Runoff = 0.96 cfs @ 12.07 hrs, Volume= 3,058 cf, Depth> 2.49"

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 Storm Rainfall=3.25"

Area (sf)	CN	Description
11,122	98	Paved parking, HSG C
2,851	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
* 360	98	Modular Block Retaining Walls, HSG
* 340	98	Vertical Granite Curbing, HSG C
14,725	93	Weighted Average
2,851		19.36% Pervious Area
11,874		80.64% Impervious Area

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

Subcatchment PWS-1A: PWS#1A



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Type III 24-hr 2-Year Storm Rainfall=3.25"

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Summary for Subcatchment PWS-1C: PWS#1C

Runoff = 1.56 cfs @ 12.15 hrs, Volume= 5,708 cf, Depth> 1.72"

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 Storm Rainfall=3.25"

Area (sf)	CN	Description
7,052	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 22,777	83	Wetlands, HSG D
1,988	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
39,801	84	Weighted Average
31,817		79.94% Pervious Area
7,984		20.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

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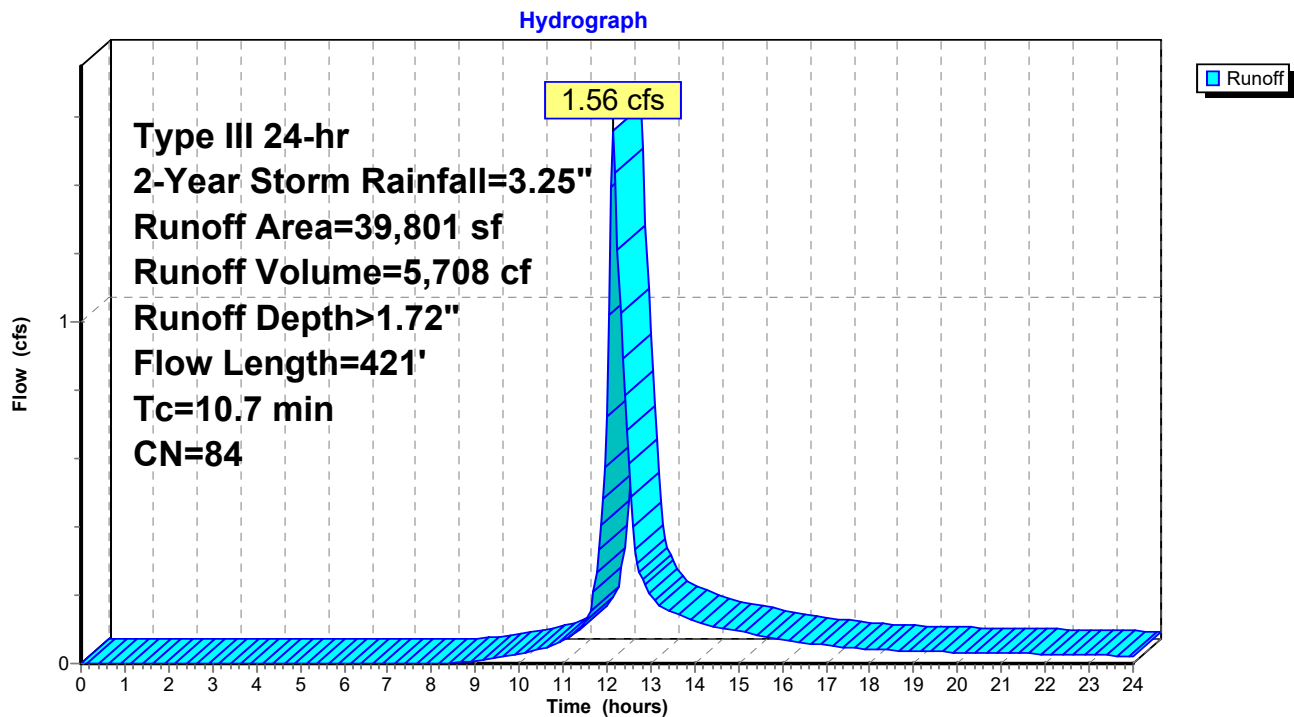
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Type III 24-hr 2-Year Storm Rainfall=3.25"

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Subcatchment PWS-1C: PWS#1C



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Type III 24-hr 2-Year Storm Rainfall=3.25"

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Summary for Subcatchment PWS1B: ROOF

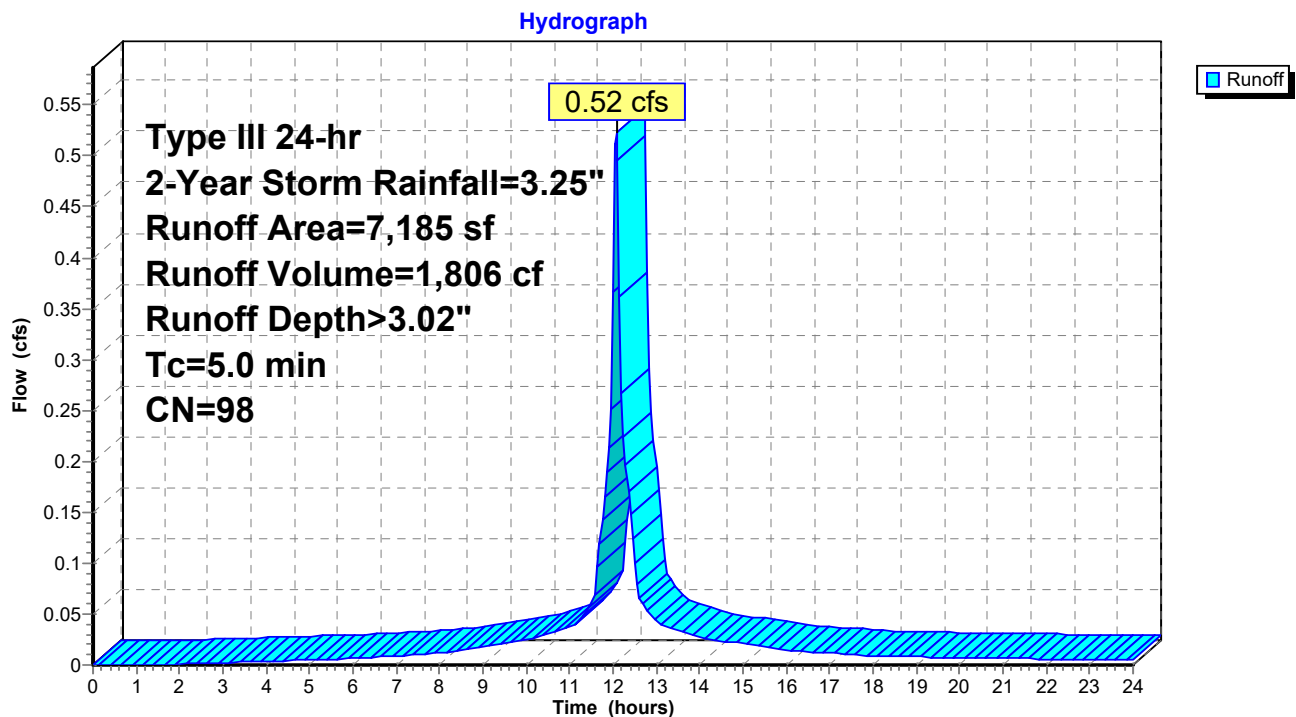
Runoff = 0.52 cfs @ 12.07 hrs, Volume= 1,806 cf, Depth> 3.02"

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 Storm Rainfall=3.25"

Area (sf)	CN	Description
7,185	98	Roofs, HSG C
7,185		100.00% Impervious Area

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

Subcatchment PWS1B: ROOF



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Type III 24-hr 2-Year Storm Rainfall=3.25"

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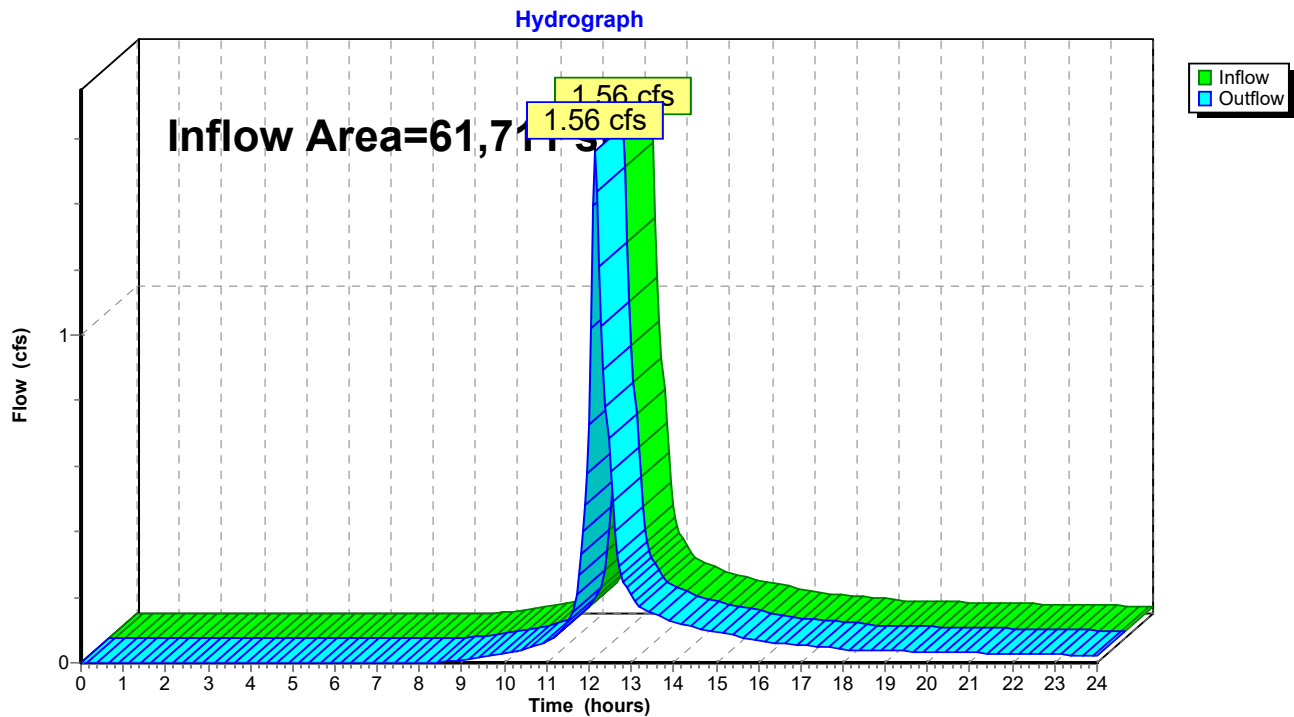
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Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 43.82% Impervious, Inflow Depth > 1.11" for 2-Year Storm event
Inflow = 1.56 cfs @ 12.15 hrs, Volume= 5,708 cf
Outflow = 1.56 cfs @ 12.15 hrs, Volume= 5,708 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert



Proposed Conditions

Type III 24-hr 2-Year Storm Rainfall=3.25"

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Summary for Pond P1: Porous Asphalt

Inflow Area = 14,725 sf, 80.64% Impervious, Inflow Depth > 2.49" for 2-Year Storm event
 Inflow = 0.96 cfs @ 12.07 hrs, Volume= 3,058 cf
 Outflow = 0.27 cfs @ 12.42 hrs, Volume= 3,056 cf, Atten= 72%, Lag= 20.6 min
 Discarded = 0.27 cfs @ 12.42 hrs, Volume= 3,056 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 17.64' @ 12.42 hrs Surf.Area= 11,122 sf Storage= 609 cf

Plug-Flow detention time= 13.5 min calculated for 3,050 cf (100% of inflow)
 Center-of-Mass det. time= 12.9 min (803.8 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	5,572 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,930 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.50	11,122	0	0
18.00	11,122	5,561	5,561
18.50	11,122	5,561	11,122
19.00	108	2,808	13,930

Device	Routing	Invert	Outlet Devices
#1	Discarded	17.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	18.95'	6.0' long x 1.0' breadth Broad-Crested Rectangular Weir X 3.00 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.27 cfs @ 12.42 hrs HW=17.64' (Free Discharge)
 ↑1=Exfiltration (Controls 0.27 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.50' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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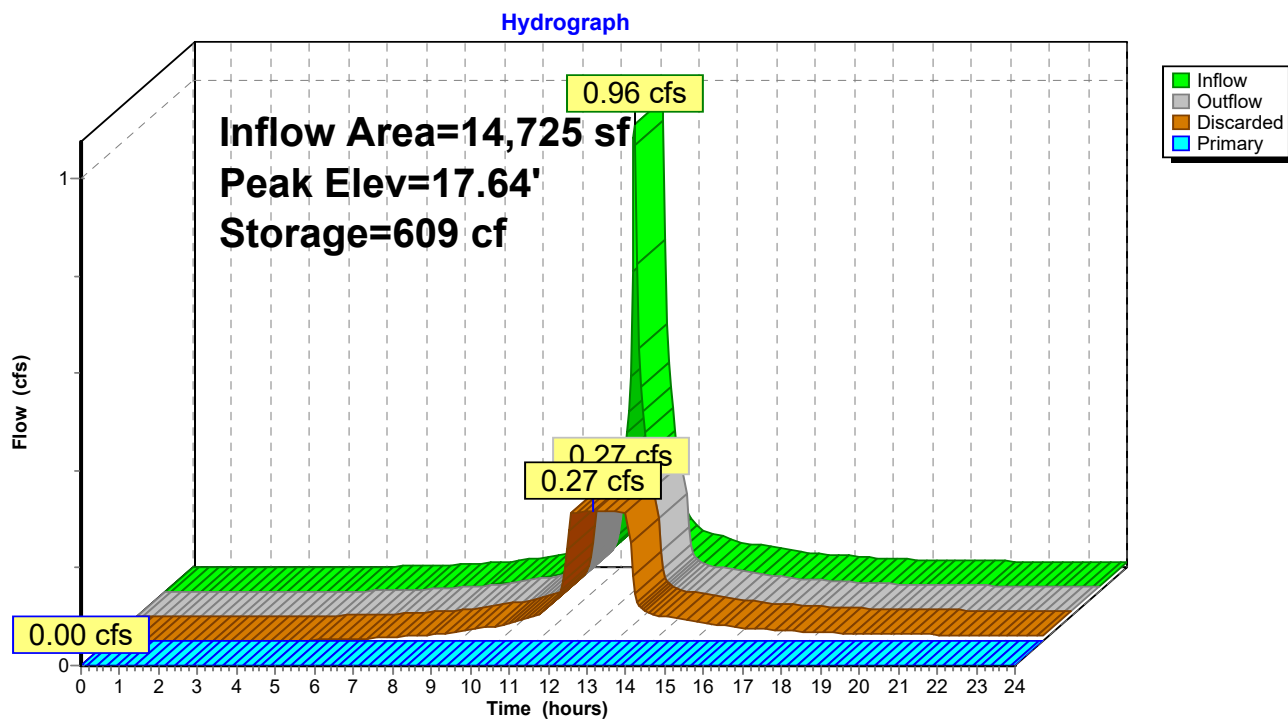
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Pond P1: Porous Asphalt



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Type III 24-hr 2-Year Storm Rainfall=3.25"

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Summary for Pond P2: Cultec 330XL

Inflow Area = 7,185 sf, 100.00% Impervious, Inflow Depth > 3.02" for 2-Year Storm event
 Inflow = 0.52 cfs @ 12.07 hrs, Volume= 1,806 cf
 Outflow = 0.03 cfs @ 13.95 hrs, Volume= 1,511 cf, Atten= 95%, Lag= 112.6 min
 Discarded = 0.03 cfs @ 13.95 hrs, Volume= 1,511 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 16.06' @ 13.95 hrs Surf.Area= 821 sf Storage= 858 cf

Plug-Flow detention time= 248.3 min calculated for 1,508 cf (84% of inflow)
 Center-of-Mass det. time= 181.2 min (936.1 - 754.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.50'	737 cf	11.17'W x 73.50'L x 3.54'H Field A 2,907 cf Overall - 1,065 cf Embedded = 1,841 cf x 40.0% Voids
#2A	15.00'	1,065 cf	Cultec R-330XL x 20 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		1,802 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	17.45'	4.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.03 cfs @ 13.95 hrs HW=16.06' (Free Discharge)↑**1=Exfiltration** (Controls 0.03 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 2-Year Storm Rainfall=3.25"

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Pond P2: Cultec 330XL - Chamber Wizard Field A

Chamber Model = Cultec R-330XL (Cultec Recharger® 330XL - DISCONTINUED, Use R-330XLHD for new designs)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

20 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,065.5 cf Chamber Storage

2,906.8 cf Field - 1,065.5 cf Chambers = 1,841.3 cf Stone x 40.0% Voids = 736.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,802.0 cf = 0.041 af

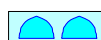
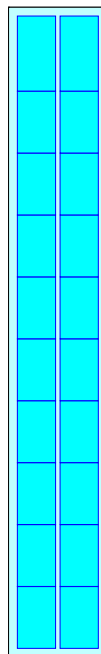
Overall Storage Efficiency = 62.0%

Overall System Size = 73.50' x 11.17' x 3.54'

20 Chambers

107.7 cy Field

68.2 cy Stone



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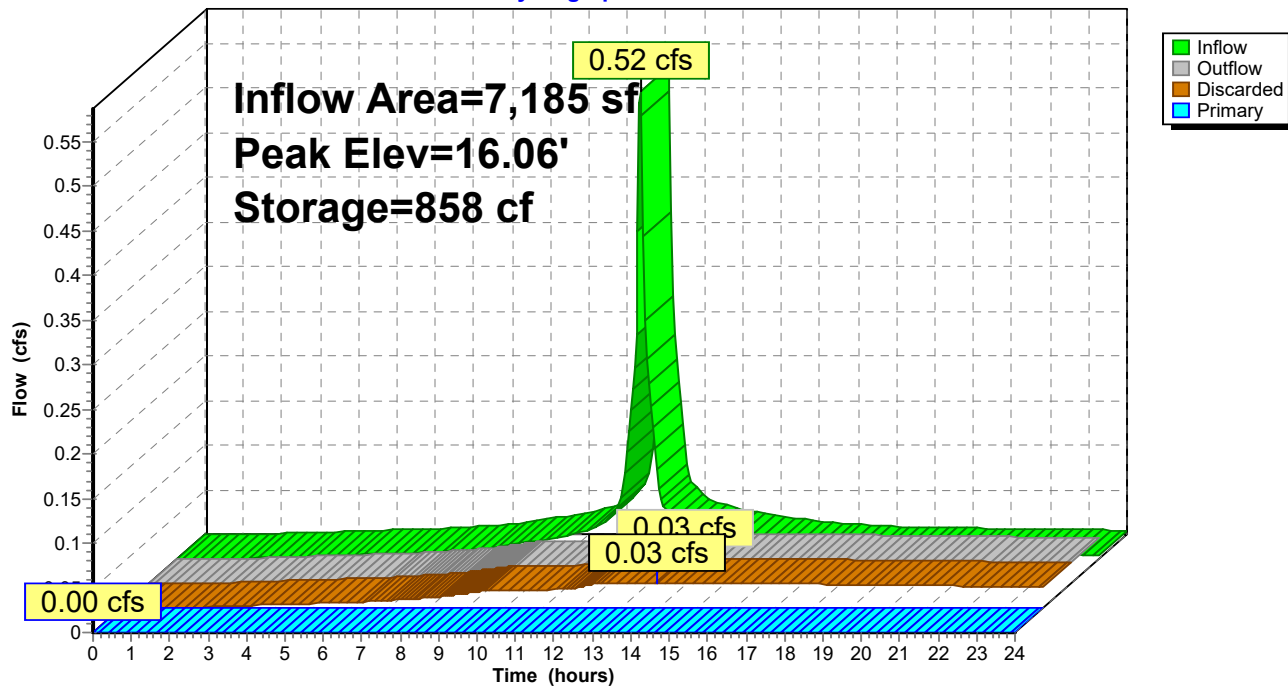
Type III 24-hr 2-Year Storm Rainfall=3.25"

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Pond P2: Cultec 330XL

Hydrograph



Proposed Conditions*Type III 24-hr 10-Year Storm Rainfall=5.13"*

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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 PWS-1A: PWS#1A

Runoff Area=14,725 sf 80.64% Impervious Runoff Depth>4.32"
Tc=5.0 min CN=93 Runoff=1.62 cfs 5,305 cf

Subcatchment PWS-1C: PWS#1C

Runoff Area=39,801 sf 20.06% Impervious Runoff Depth>3.38"
Flow Length=421' Tc=10.7 min CN=84 Runoff=3.06 cfs 11,223 cf

Subcatchment PWS1B: ROOF

Runoff Area=7,185 sf 100.00% Impervious Runoff Depth>4.89"
Tc=5.0 min CN=98 Runoff=0.83 cfs 2,928 cf

Reach DP-1: Culvert

Inflow=3.06 cfs 11,223 cf
Outflow=3.06 cfs 11,223 cf

Pond P1: Porous Asphalt

Peak Elev=17.83' Storage=1,477 cf Inflow=1.62 cfs 5,305 cf
Discarded=0.28 cfs 5,301 cf Primary=0.00 cfs 0 cf Outflow=0.28 cfs 5,301 cf

Pond P2: Cultec 330XL

Peak Elev=17.38' Storage=1,582 cf Inflow=0.83 cfs 2,928 cf
Discarded=0.04 cfs 1,945 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 1,945 cf

Total Runoff Area = 61,711 sf Runoff Volume = 19,457 cf Average Runoff Depth = 3.78"
56.18% Pervious = 34,668 sf 43.82% Impervious = 27,043 sf

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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Summary for Subcatchment PWS-1A: PWS#1A

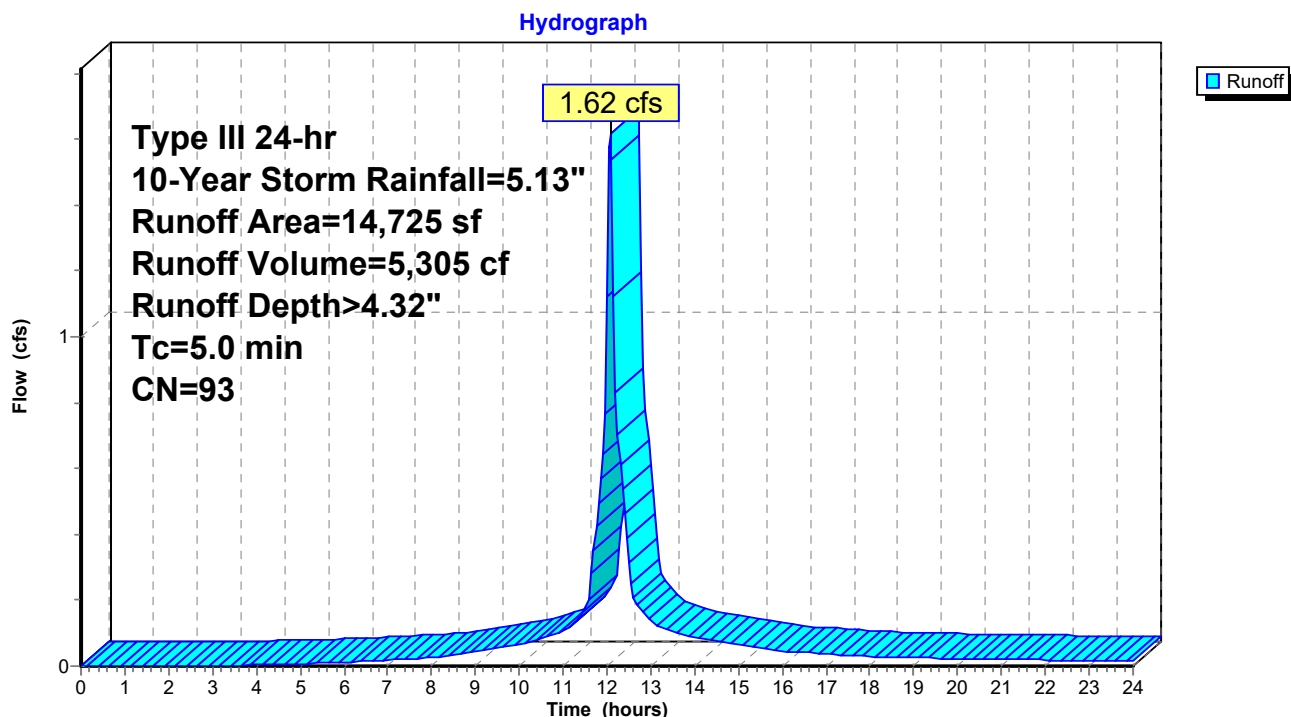
Runoff = 1.62 cfs @ 12.07 hrs, Volume= 5,305 cf, Depth> 4.32"

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 Storm Rainfall=5.13"

Area (sf)	CN	Description
11,122	98	Paved parking, HSG C
2,851	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
* 360	98	Modular Block Retaining Walls, HSG
* 340	98	Vertical Granite Curbing, HSG C
14,725	93	Weighted Average
2,851		19.36% Pervious Area
11,874		80.64% Impervious Area

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

Subcatchment PWS-1A: PWS#1A



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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Summary for Subcatchment PWS-1C: PWS#1C

Runoff = 3.06 cfs @ 12.15 hrs, Volume= 11,223 cf, Depth> 3.38"

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 Storm Rainfall=5.13"

Area (sf)	CN	Description
7,052	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 22,777	83	Wetlands, HSG D
1,988	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
39,801	84	Weighted Average
31,817		79.94% Pervious Area
7,984		20.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

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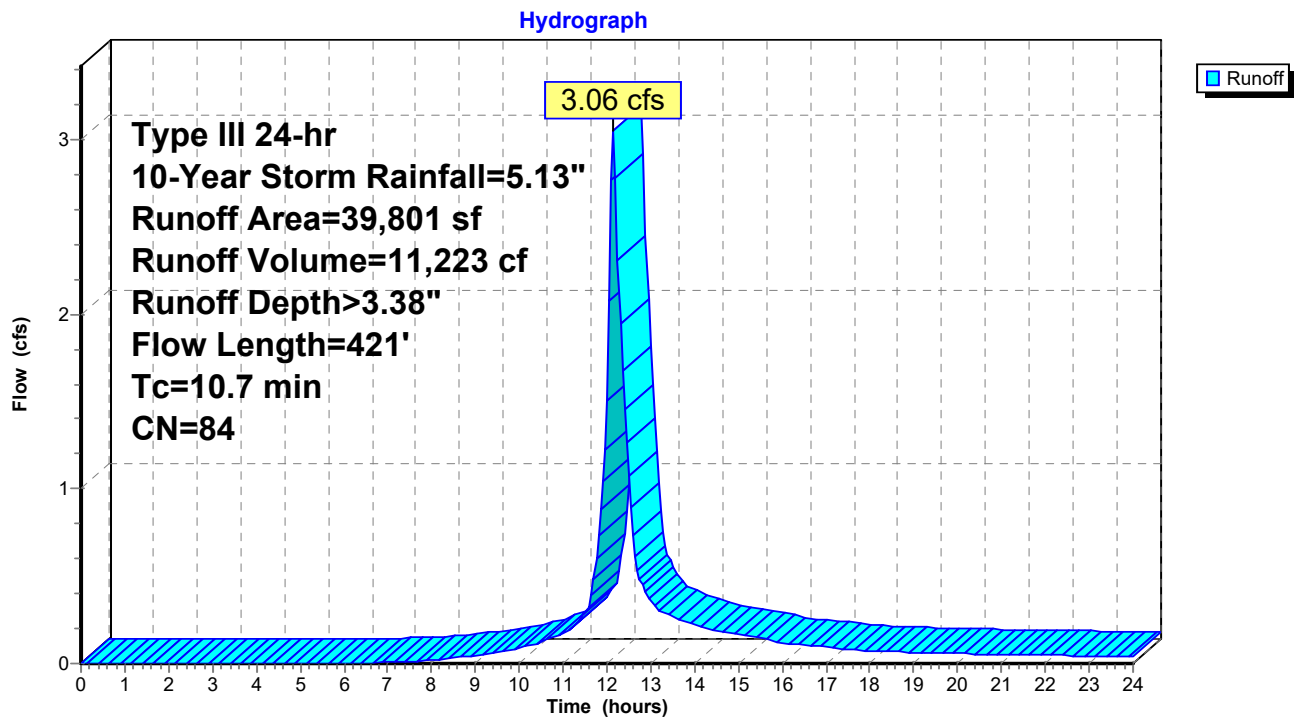
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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Subcatchment PWS-1C: PWS#1C



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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Summary for Subcatchment PWS1B: ROOF

Runoff = 0.83 cfs @ 12.07 hrs, Volume= 2,928 cf, Depth> 4.89"

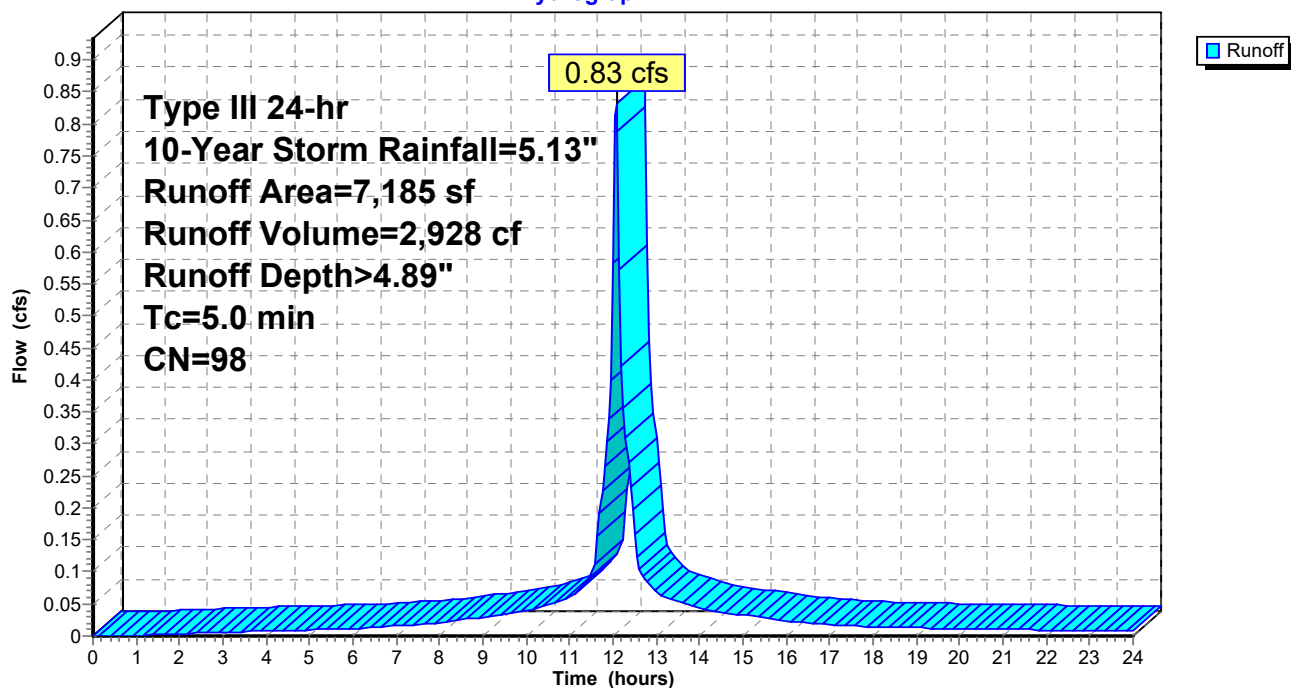
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.13"

Area (sf)	CN	Description
7,185	98	Roofs, HSG C
7,185		100.00% Impervious Area

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

Subcatchment PWS1B: ROOF

Hydrograph



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Type III 24-hr 10-Year Storm Rainfall=5.13"

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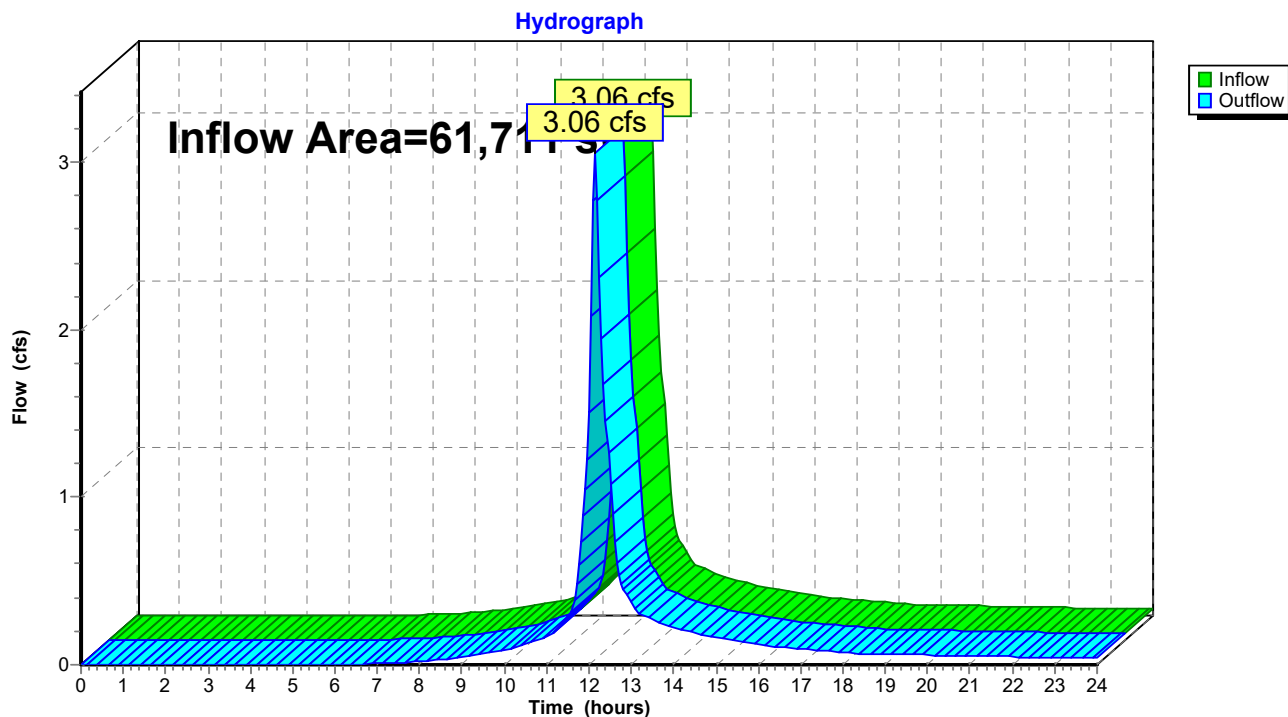
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Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 43.82% Impervious, Inflow Depth > 2.18" for 10-Year Storm event
Inflow = 3.06 cfs @ 12.15 hrs, Volume= 11,223 cf
Outflow = 3.06 cfs @ 12.15 hrs, Volume= 11,223 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert



Proposed Conditions

Type III 24-hr 10-Year Storm Rainfall=5.13"

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Summary for Pond P1: Porous Asphalt

Inflow Area = 14,725 sf, 80.64% Impervious, Inflow Depth > 4.32" for 10-Year Storm event
 Inflow = 1.62 cfs @ 12.07 hrs, Volume= 5,305 cf
 Outflow = 0.28 cfs @ 12.53 hrs, Volume= 5,301 cf, Atten= 83%, Lag= 27.5 min
 Discarded = 0.28 cfs @ 12.53 hrs, Volume= 5,301 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 17.83' @ 12.53 hrs Surf.Area= 11,122 sf Storage= 1,477 cf

Plug-Flow detention time= 32.9 min calculated for 5,290 cf (100% of inflow)
 Center-of-Mass det. time= 32.4 min (808.6 - 776.2)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	5,572 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,930 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.50	11,122	0	0
18.00	11,122	5,561	5,561
18.50	11,122	5,561	11,122
19.00	108	2,808	13,930

Device	Routing	Invert	Outlet Devices
#1	Discarded	17.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	18.95'	6.0' long x 1.0' breadth Broad-Crested Rectangular Weir X 3.00 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.28 cfs @ 12.53 hrs HW=17.83' (Free Discharge)
 ↑1=Exfiltration (Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.50' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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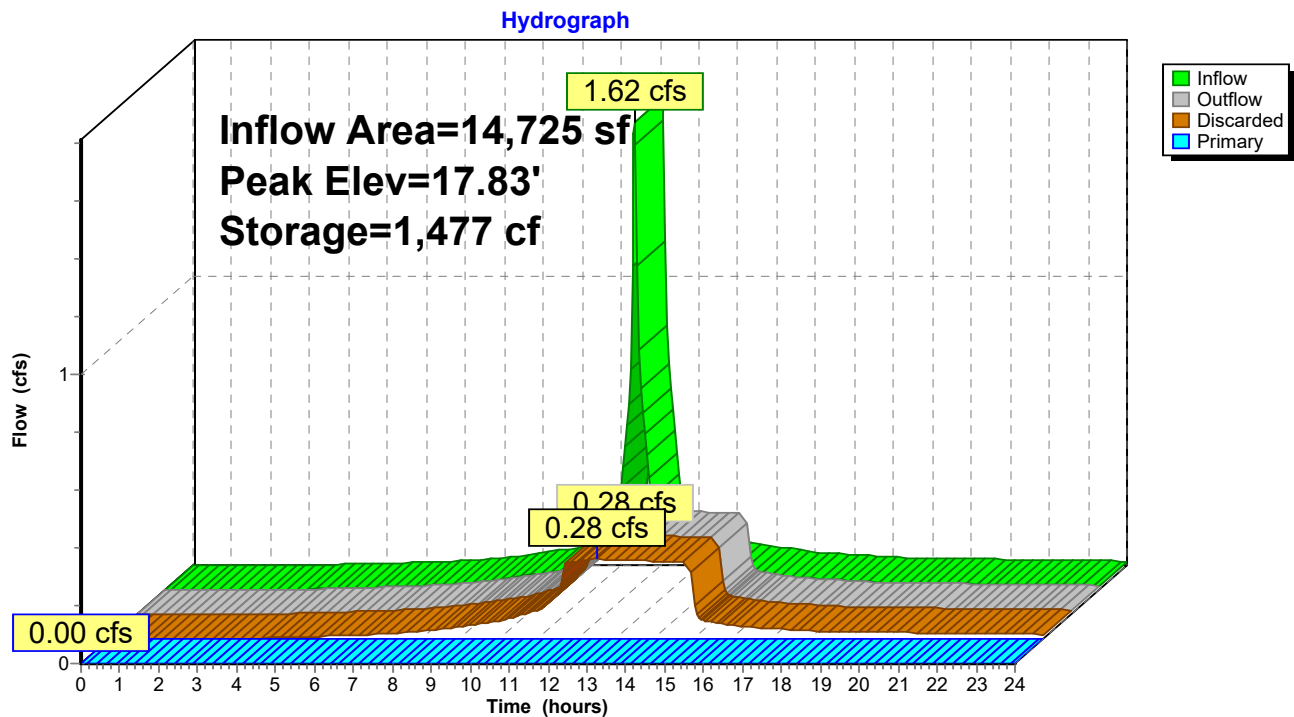
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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Pond P1: Porous Asphalt



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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Summary for Pond P2: Cultec 330XL

Inflow Area = 7,185 sf, 100.00% Impervious, Inflow Depth > 4.89" for 10-Year Storm event
 Inflow = 0.83 cfs @ 12.07 hrs, Volume= 2,928 cf
 Outflow = 0.04 cfs @ 14.73 hrs, Volume= 1,945 cf, Atten= 96%, Lag= 159.6 min
 Discarded = 0.04 cfs @ 14.73 hrs, Volume= 1,945 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 17.38' @ 14.73 hrs Surf.Area= 821 sf Storage= 1,582 cf

Plug-Flow detention time= 268.4 min calculated for 1,941 cf (66% of inflow)
 Center-of-Mass det. time= 168.8 min (915.1 - 746.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.50'	737 cf	11.17'W x 73.50'L x 3.54'H Field A 2,907 cf Overall - 1,065 cf Embedded = 1,841 cf x 40.0% Voids
#2A	15.00'	1,065 cf	Cultec R-330XL x 20 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		1,802 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	17.45'	4.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 14.73 hrs HW=17.38' (Free Discharge)↑**1=Exfiltration** (Controls 0.04 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=14.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 10-Year Storm Rainfall=5.13"

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Pond P2: Cultec 330XL - Chamber Wizard Field A

Chamber Model = Cultec R-330XL (Cultec Recharger® 330XL - DISCONTINUED, Use R-330XLHD for new designs)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

20 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,065.5 cf Chamber Storage

2,906.8 cf Field - 1,065.5 cf Chambers = 1,841.3 cf Stone x 40.0% Voids = 736.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,802.0 cf = 0.041 af

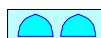
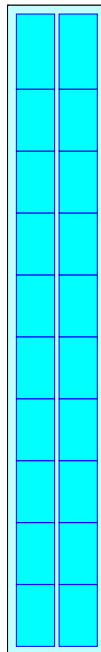
Overall Storage Efficiency = 62.0%

Overall System Size = 73.50' x 11.17' x 3.54'

20 Chambers

107.7 cy Field

68.2 cy Stone



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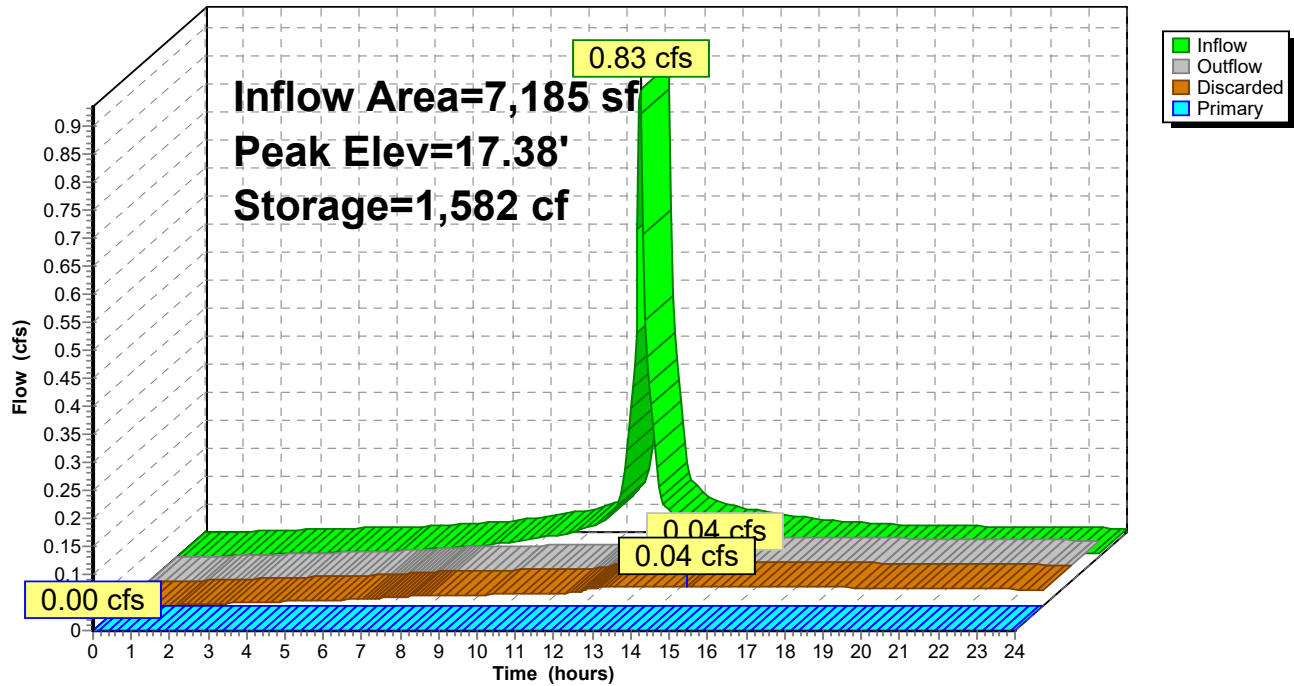
Type III 24-hr 10-Year Storm Rainfall=5.13"

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Pond P2: Cultec 330XL

Hydrograph



Proposed Conditions*Type III 24-hr 25-Year Storm Rainfall=6.31"*

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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 PWS-1A: PWS#1A

Runoff Area=14,725 sf 80.64% Impervious Runoff Depth>5.49"
Tc=5.0 min CN=93 Runoff=2.03 cfs 6,732 cf

Subcatchment PWS-1C: PWS#1C

Runoff Area=39,801 sf 20.06% Impervious Runoff Depth>4.48"
Flow Length=421' Tc=10.7 min CN=84 Runoff=4.01 cfs 14,860 cf

Subcatchment PWS1B: ROOF

Runoff Area=7,185 sf 100.00% Impervious Runoff Depth>6.07"
Tc=5.0 min CN=98 Runoff=1.03 cfs 3,634 cf

Reach DP-1: Culvert

Inflow=4.01 cfs 15,346 cf
Outflow=4.01 cfs 15,346 cf

Pond P1: Porous Asphalt

Peak Elev=17.96' Storage=2,061 cf Inflow=2.03 cfs 6,732 cf
Discarded=0.28 cfs 6,727 cf Primary=0.00 cfs 0 cf Outflow=0.28 cfs 6,727 cf

Pond P2: Cultec 330XL

Peak Elev=17.55' Storage=1,642 cf Inflow=1.03 cfs 3,634 cf
Discarded=0.04 cfs 2,062 cf Primary=0.35 cfs 486 cf Outflow=0.39 cfs 2,548 cf

Total Runoff Area = 61,711 sf Runoff Volume = 25,225 cf Average Runoff Depth = 4.91"
56.18% Pervious = 34,668 sf 43.82% Impervious = 27,043 sf

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Type III 24-hr 25-Year Storm Rainfall=6.31"

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Summary for Subcatchment PWS-1A: PWS#1A

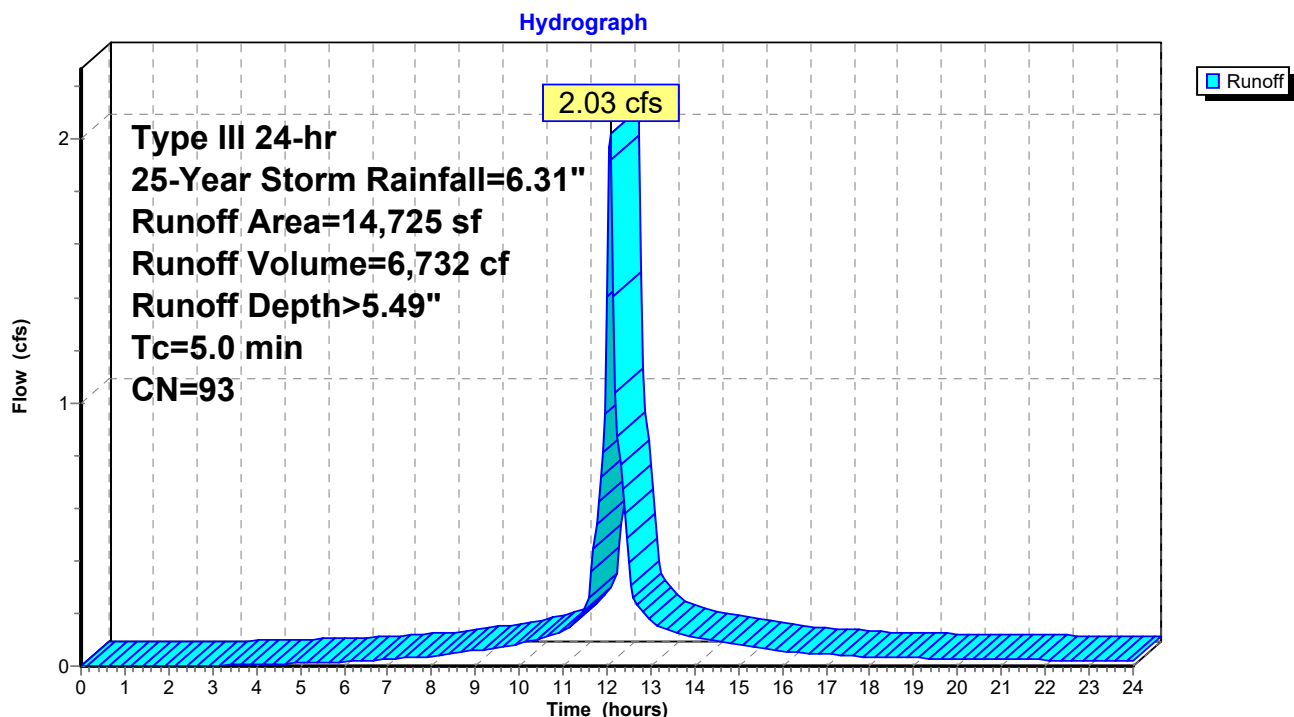
Runoff = 2.03 cfs @ 12.07 hrs, Volume= 6,732 cf, Depth> 5.49"

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 25-Year Storm Rainfall=6.31"

Area (sf)	CN	Description
11,122	98	Paved parking, HSG C
2,851	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
* 360	98	Modular Block Retaining Walls, HSG
* 340	98	Vertical Granite Curbing, HSG C
14,725	93	Weighted Average
2,851		19.36% Pervious Area
11,874		80.64% Impervious Area

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

Subcatchment PWS-1A: PWS#1A



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Type III 24-hr 25-Year Storm Rainfall=6.31"

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Summary for Subcatchment PWS-1C: PWS#1C

Runoff = 4.01 cfs @ 12.15 hrs, Volume= 14,860 cf, Depth> 4.48"

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 25-Year Storm Rainfall=6.31"

Area (sf)	CN	Description
7,052	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 22,777	83	Wetlands, HSG D
1,988	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
39,801	84	Weighted Average
31,817		79.94% Pervious Area
7,984		20.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

Proposed Conditions

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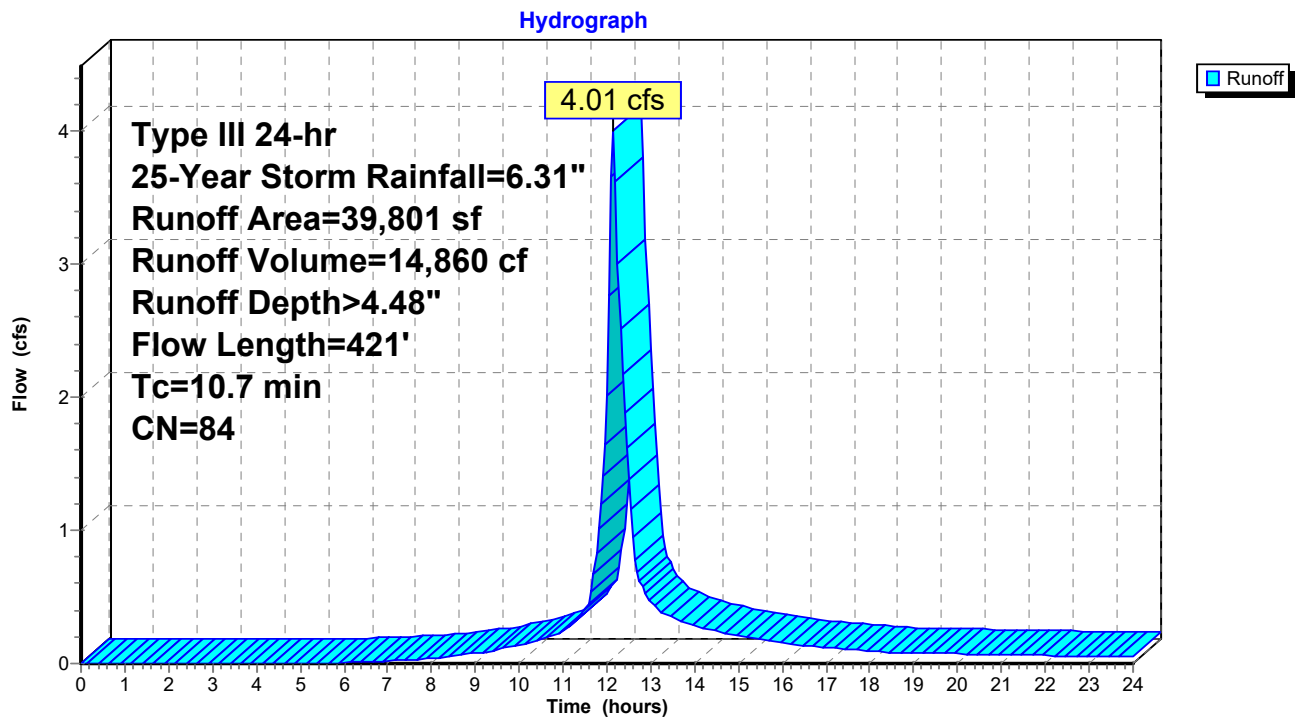
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Subcatchment PWS-1C: PWS#1C



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Type III 24-hr 25-Year Storm Rainfall=6.31"

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Summary for Subcatchment PWS1B: ROOF

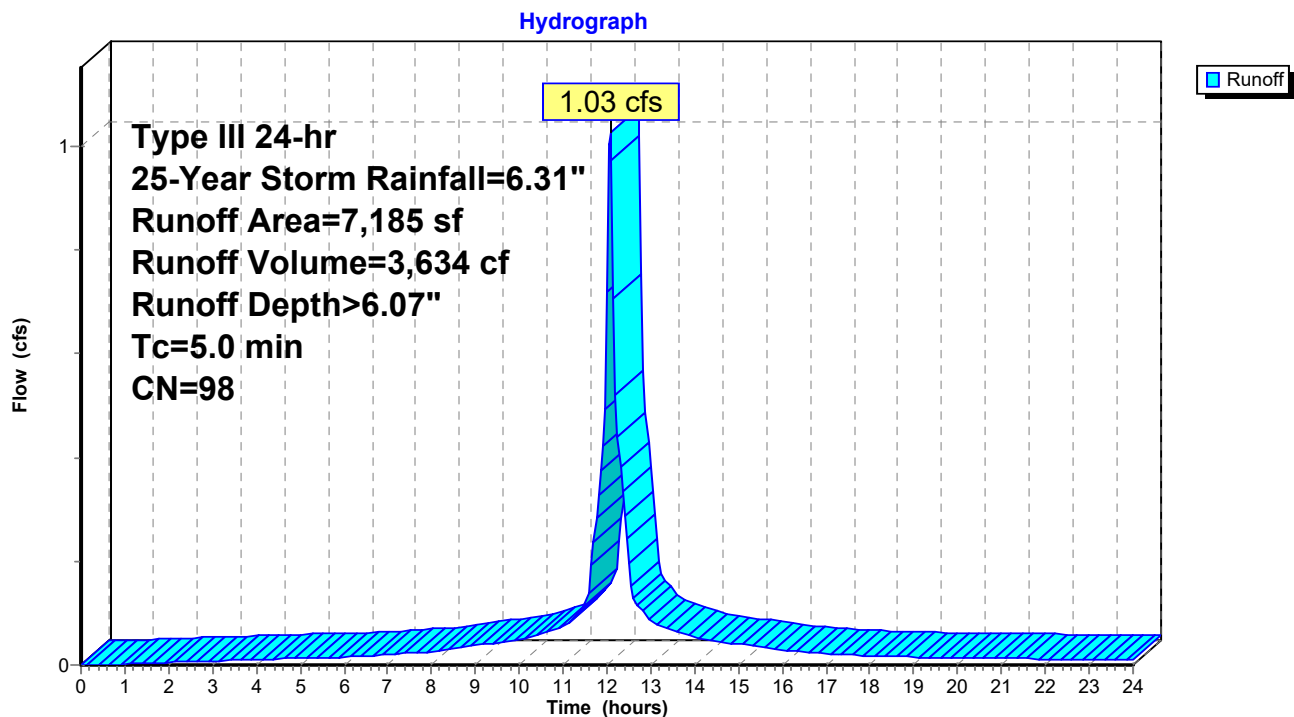
Runoff = 1.03 cfs @ 12.07 hrs, Volume= 3,634 cf, Depth> 6.07"

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 25-Year Storm Rainfall=6.31"

Area (sf)	CN	Description
7,185	98	Roofs, HSG C
7,185		100.00% Impervious Area

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

Subcatchment PWS1B: ROOF



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Type III 24-hr 25-Year Storm Rainfall=6.31"

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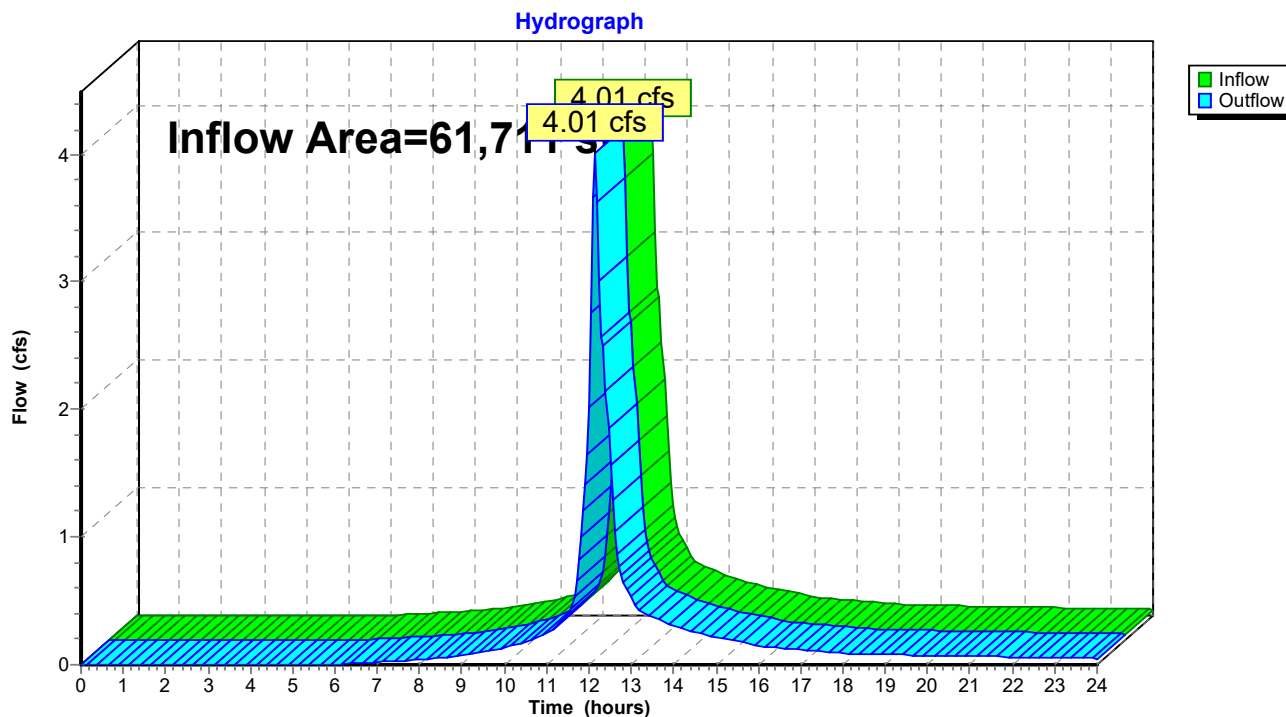
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Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 43.82% Impervious, Inflow Depth > 2.98" for 25-Year Storm event
Inflow = 4.01 cfs @ 12.15 hrs, Volume= 15,346 cf
Outflow = 4.01 cfs @ 12.15 hrs, Volume= 15,346 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert



Proposed Conditions

Type III 24-hr 25-Year Storm Rainfall=6.31"

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Summary for Pond P1: Porous Asphalt

Inflow Area = 14,725 sf, 80.64% Impervious, Inflow Depth > 5.49" for 25-Year Storm event
 Inflow = 2.03 cfs @ 12.07 hrs, Volume= 6,732 cf
 Outflow = 0.28 cfs @ 12.58 hrs, Volume= 6,727 cf, Atten= 86%, Lag= 30.4 min
 Discarded = 0.28 cfs @ 12.58 hrs, Volume= 6,727 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 17.96' @ 12.58 hrs Surf.Area= 11,122 sf Storage= 2,061 cf

Plug-Flow detention time= 47.8 min calculated for 6,713 cf (100% of inflow)
 Center-of-Mass det. time= 47.2 min (817.5 - 770.3)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	5,572 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,930 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.50	11,122	0	0
18.00	11,122	5,561	5,561
18.50	11,122	5,561	11,122
19.00	108	2,808	13,930

Device	Routing	Invert	Outlet Devices
#1	Discarded	17.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	18.95'	6.0' long x 1.0' breadth Broad-Crested Rectangular Weir X 3.00 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.28 cfs @ 12.58 hrs HW=17.96' (Free Discharge)
 ↑**1=Exfiltration** (Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.50' (Free Discharge)
 ↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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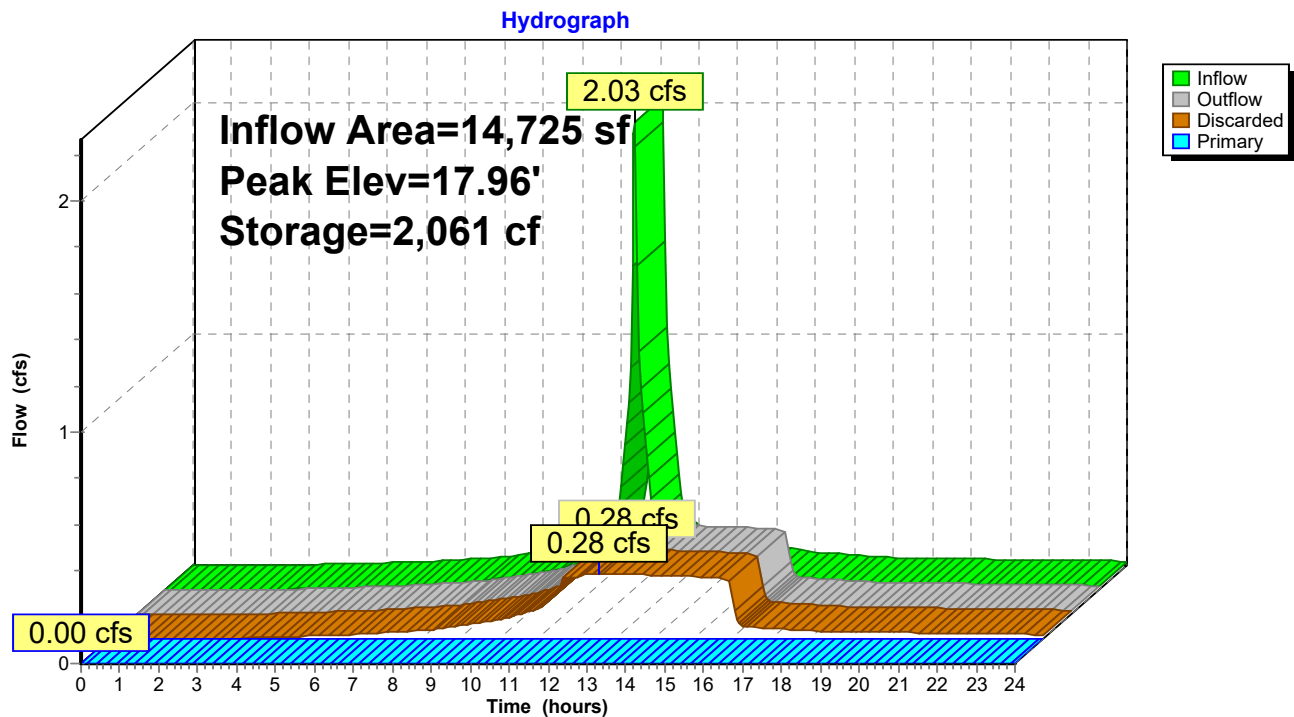
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Type III 24-hr 25-Year Storm Rainfall=6.31"

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Pond P1: Porous Asphalt



Proposed Conditions

Type III 24-hr 25-Year Storm Rainfall=6.31"

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Summary for Pond P2: Cultec 330XL

Inflow Area = 7,185 sf, 100.00% Impervious, Inflow Depth > 6.07" for 25-Year Storm event
 Inflow = 1.03 cfs @ 12.07 hrs, Volume= 3,634 cf
 Outflow = 0.39 cfs @ 12.37 hrs, Volume= 2,548 cf, Atten= 62%, Lag= 17.7 min
 Discarded = 0.04 cfs @ 12.37 hrs, Volume= 2,062 cf
 Primary = 0.35 cfs @ 12.37 hrs, Volume= 486 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 17.55' @ 12.37 hrs Surf.Area= 821 sf Storage= 1,642 cf

Plug-Flow detention time= 225.2 min calculated for 2,543 cf (70% of inflow)
 Center-of-Mass det. time= 130.6 min (873.8 - 743.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.50'	737 cf	11.17'W x 73.50'L x 3.54'H Field A 2,907 cf Overall - 1,065 cf Embedded = 1,841 cf x 40.0% Voids
#2A	15.00'	1,065 cf	Cultec R-330XL x 20 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		1,802 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	17.45'	4.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 12.37 hrs HW=17.54' (Free Discharge)↑**1=Exfiltration** (Controls 0.04 cfs)**Primary OutFlow** Max=0.31 cfs @ 12.37 hrs HW=17.54' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.31 cfs @ 0.82 fps)

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Type III 24-hr 25-Year Storm Rainfall=6.31"

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Pond P2: Cultec 330XL - Chamber Wizard Field A

Chamber Model = Cultec R-330XL (Cultec Recharger® 330XL - DISCONTINUED, Use R-330XLHD for new designs)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

20 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,065.5 cf Chamber Storage

2,906.8 cf Field - 1,065.5 cf Chambers = 1,841.3 cf Stone x 40.0% Voids = 736.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,802.0 cf = 0.041 af

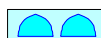
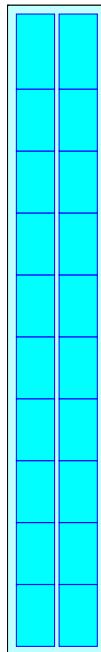
Overall Storage Efficiency = 62.0%

Overall System Size = 73.50' x 11.17' x 3.54'

20 Chambers

107.7 cy Field

68.2 cy Stone



Proposed Conditions

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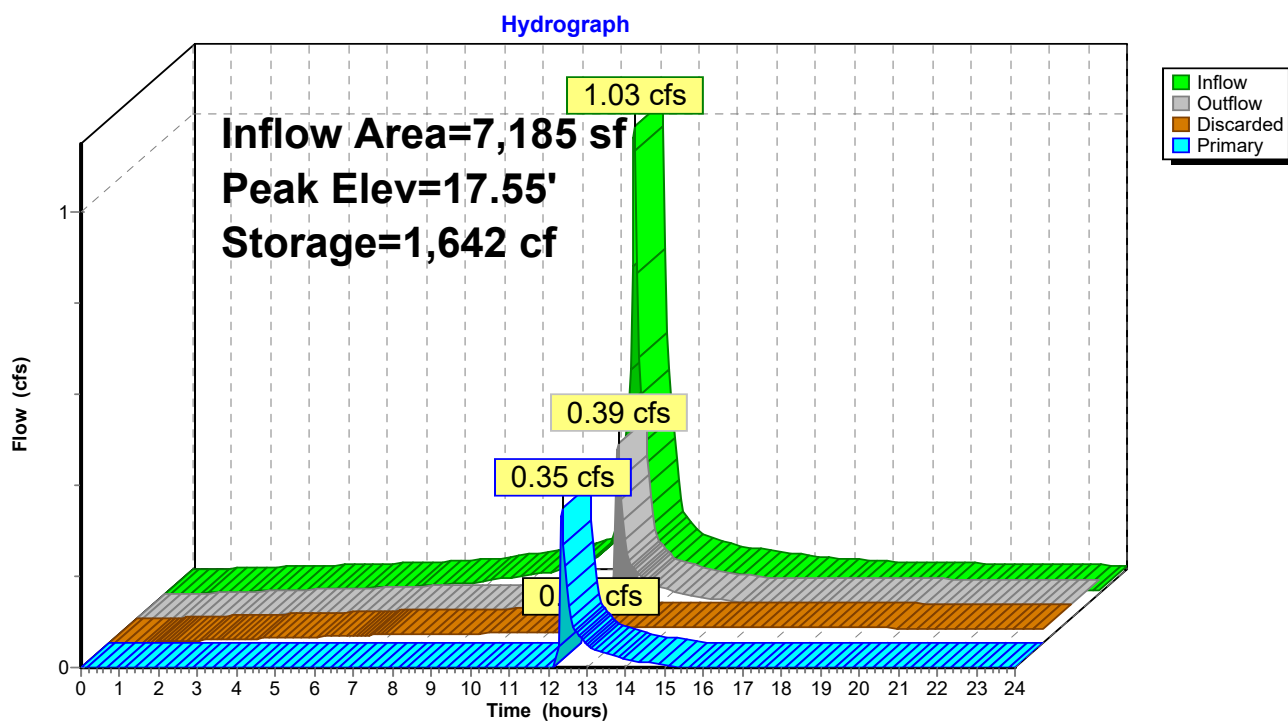
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Type III 24-hr 25-Year Storm Rainfall=6.31"

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Pond P2: Cultec 330XL



Proposed Conditions*Type III 24-hr 100-Year Storm Rainfall=8.12"*

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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 PWS-1A: PWS#1A

Runoff Area=14,725 sf 80.64% Impervious Runoff Depth>7.28"
Tc=5.0 min CN=93 Runoff=2.65 cfs 8,931 cf

Subcatchment PWS-1C: PWS#1C

Runoff Area=39,801 sf 20.06% Impervious Runoff Depth>6.20"
Flow Length=421' Tc=10.7 min CN=84 Runoff=5.47 cfs 20,567 cf

Subcatchment PWS1B: ROOF

Runoff Area=7,185 sf 100.00% Impervious Runoff Depth>7.88"
Tc=5.0 min CN=98 Runoff=1.32 cfs 4,716 cf

Reach DP-1: Culvert

Inflow=6.69 cfs 21,900 cf
Outflow=6.69 cfs 21,900 cf

Pond P1: Porous Asphalt

Peak Elev=18.17' Storage=2,997 cf Inflow=2.65 cfs 8,931 cf
Discarded=0.29 cfs 8,925 cf Primary=0.00 cfs 0 cf Outflow=0.29 cfs 8,925 cf

Pond P2: Cultec 330XL

Peak Elev=17.68' Storage=1,685 cf Inflow=1.32 cfs 4,716 cf
Discarded=0.04 cfs 2,187 cf Primary=1.22 cfs 1,332 cf Outflow=1.26 cfs 3,520 cf

Total Runoff Area = 61,711 sf Runoff Volume = 34,214 cf Average Runoff Depth = 6.65"
56.18% Pervious = 34,668 sf 43.82% Impervious = 27,043 sf

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Type III 24-hr 100-Year Storm Rainfall=8.12"

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Summary for Subcatchment PWS-1A: PWS#1A

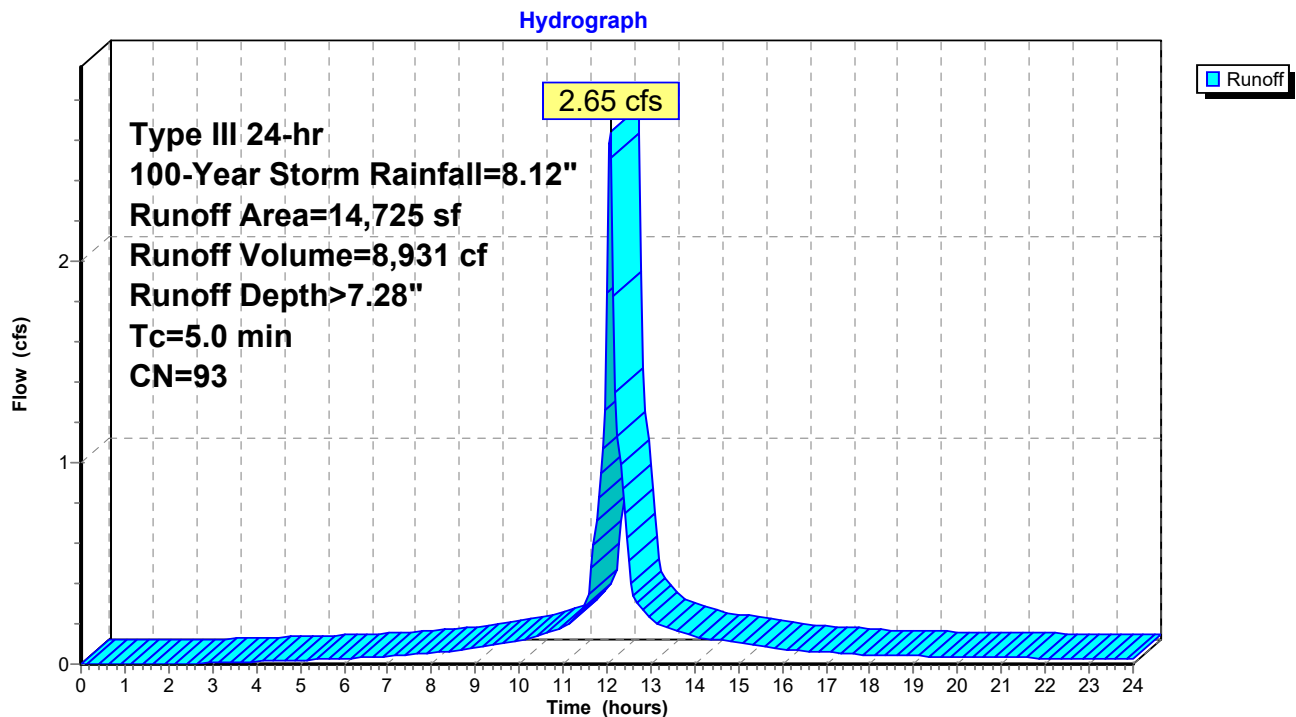
Runoff = 2.65 cfs @ 12.07 hrs, Volume= 8,931 cf, Depth> 7.28"

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 Storm Rainfall=8.12"

Area (sf)	CN	Description
11,122	98	Paved parking, HSG C
2,851	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
* 360	98	Modular Block Retaining Walls, HSG
* 340	98	Vertical Granite Curbing, HSG C
14,725	93	Weighted Average
2,851		19.36% Pervious Area
11,874		80.64% Impervious Area

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

Subcatchment PWS-1A: PWS#1A



Proposed Conditions

Type III 24-hr 100-Year Storm Rainfall=8.12"

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Summary for Subcatchment PWS-1C: PWS#1C

Runoff = 5.47 cfs @ 12.15 hrs, Volume= 20,567 cf, Depth> 6.20"

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 Storm Rainfall=8.12"

Area (sf)	CN	Description
7,052	77	Woods, Poor, HSG C
* 7,932	98	Land Under Water
* 22,777	83	Wetlands, HSG D
1,988	74	>75% Grass cover, Good, HSG C
* 52	98	Concrete Sidewalk, HSG C
39,801	84	Weighted Average
31,817		79.94% Pervious Area
7,984		20.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.1300	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
3.2	32	0.2300	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.25"
1.7	339	0.0050	3.41	127.96	Channel Flow, Stream Area= 37.5 sf Perim= 39.0' r= 0.96' n= 0.030 Stream, clean & straight
10.7	421	Total			

Proposed Conditions

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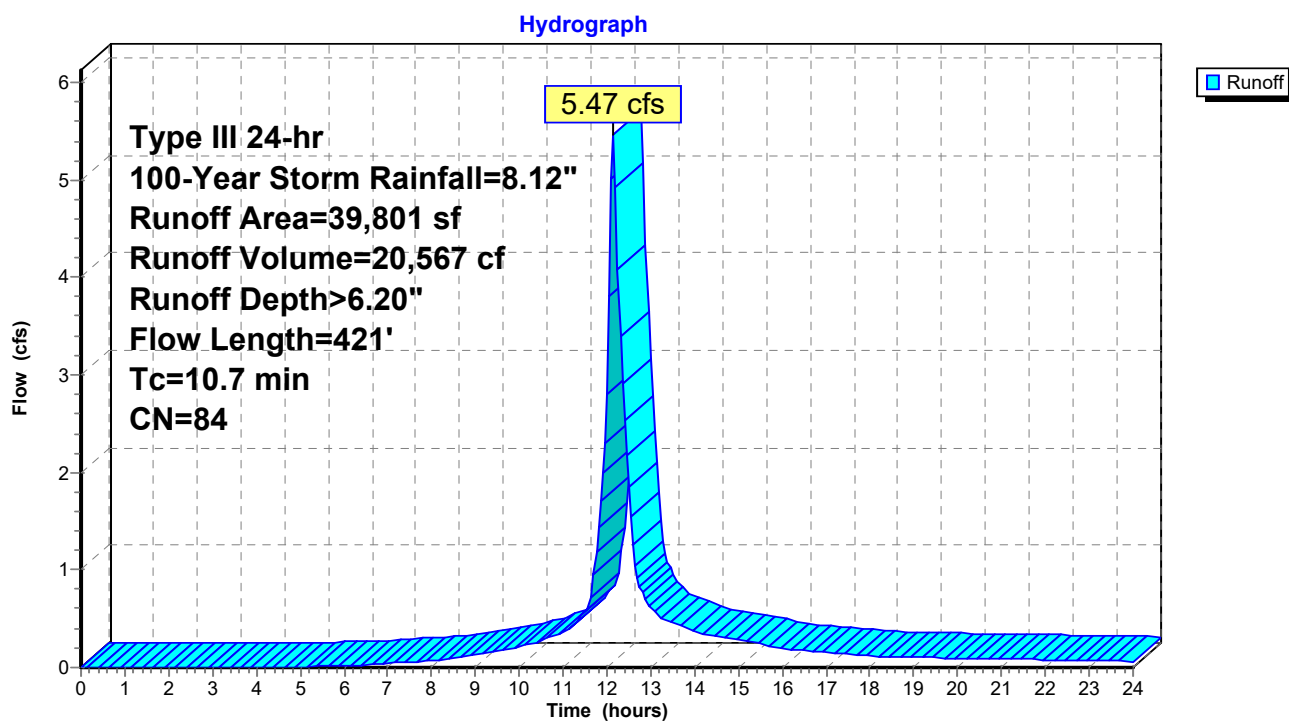
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Type III 24-hr 100-Year Storm Rainfall=8.12"

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Subcatchment PWS-1C: PWS#1C



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Type III 24-hr 100-Year Storm Rainfall=8.12"

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Summary for Subcatchment PWS1B: ROOF

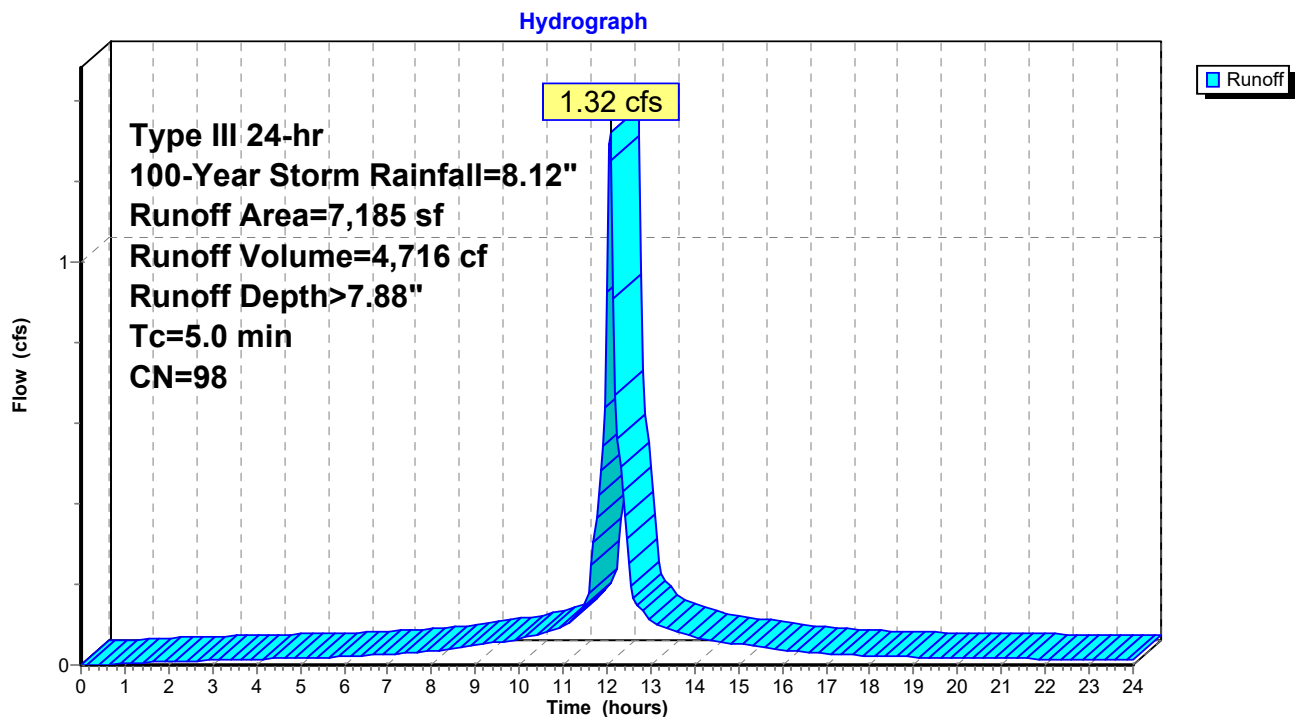
Runoff = 1.32 cfs @ 12.07 hrs, Volume= 4,716 cf, Depth> 7.88"

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 Storm Rainfall=8.12"

Area (sf)	CN	Description
7,185	98	Roofs, HSG C
7,185		100.00% Impervious Area

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

Subcatchment PWS1B: ROOF



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Type III 24-hr 100-Year Storm Rainfall=8.12"

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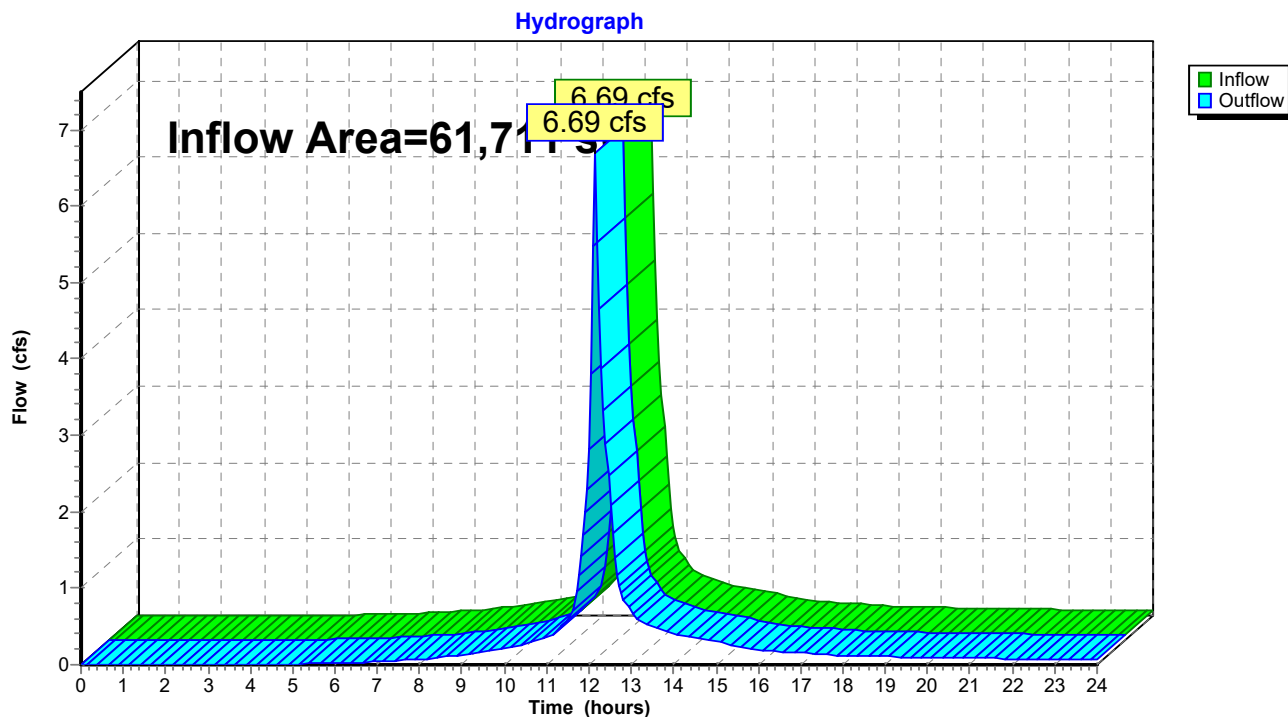
Page 44

Summary for Reach DP-1: Culvert

Inflow Area = 61,711 sf, 43.82% Impervious, Inflow Depth > 4.26" for 100-Year Storm event
Inflow = 6.69 cfs @ 12.15 hrs, Volume= 21,900 cf
Outflow = 6.69 cfs @ 12.15 hrs, Volume= 21,900 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach DP-1: Culvert



Proposed Conditions

Type III 24-hr 100-Year Storm Rainfall=8.12"

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Summary for Pond P1: Porous Asphalt

Inflow Area = 14,725 sf, 80.64% Impervious, Inflow Depth > 7.28" for 100-Year Storm event
 Inflow = 2.65 cfs @ 12.07 hrs, Volume= 8,931 cf
 Outflow = 0.29 cfs @ 12.72 hrs, Volume= 8,925 cf, Atten= 89%, Lag= 38.9 min
 Discarded = 0.29 cfs @ 12.72 hrs, Volume= 8,925 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 18.17' @ 12.72 hrs Surf.Area= 11,122 sf Storage= 2,997 cf

Plug-Flow detention time= 72.5 min calculated for 8,925 cf (100% of inflow)
 Center-of-Mass det. time= 72.0 min (835.7 - 763.7)

Volume	Invert	Avail.Storage	Storage Description
#1	17.50'	5,572 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 13,930 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
17.50	11,122	0	0
18.00	11,122	5,561	5,561
18.50	11,122	5,561	11,122
19.00	108	2,808	13,930

Device	Routing	Invert	Outlet Devices
#1	Discarded	17.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	18.95'	6.0' long x 1.0' breadth Broad-Crested Rectangular Weir X 3.00 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.29 cfs @ 12.72 hrs HW=18.17' (Free Discharge)
 ↑1=Exfiltration (Controls 0.29 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=17.50' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Proposed Conditions

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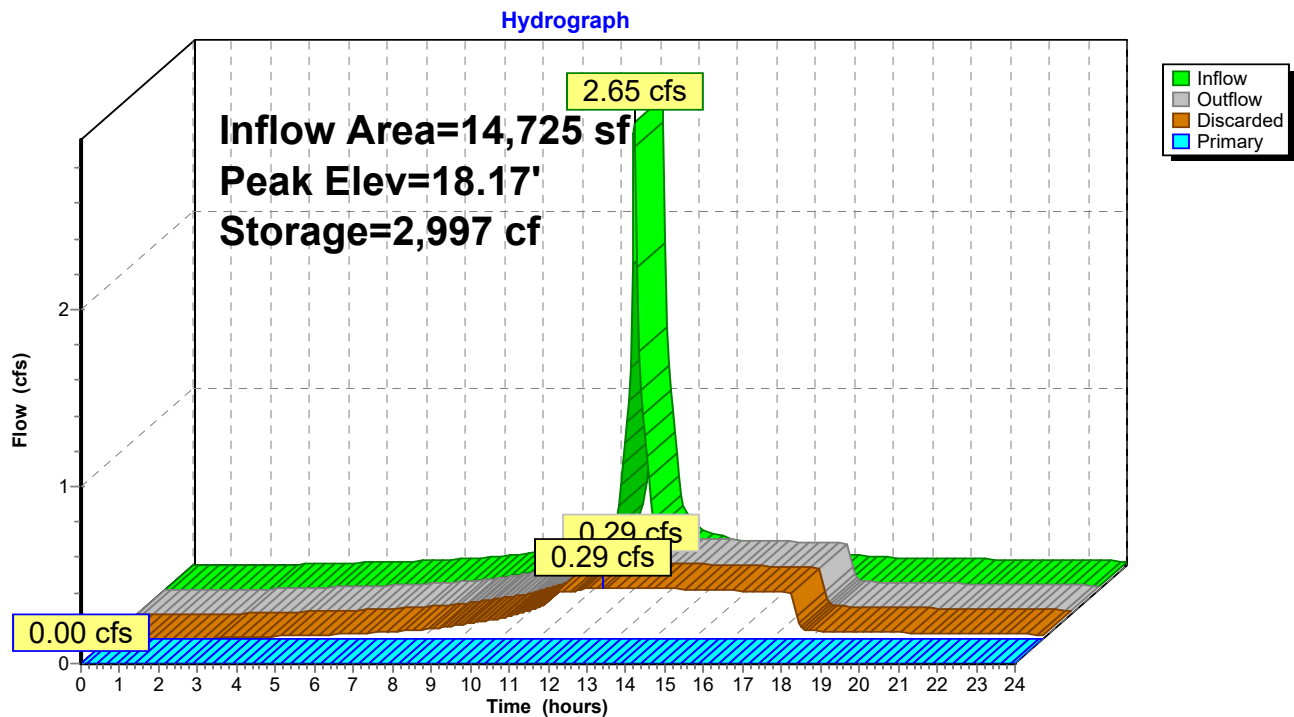
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Type III 24-hr 100-Year Storm Rainfall=8.12"

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Pond P1: Porous Asphalt



Proposed Conditions

Type III 24-hr 100-Year Storm Rainfall=8.12"

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Summary for Pond P2: Cultec 330XL

Inflow Area = 7,185 sf, 100.00% Impervious, Inflow Depth > 7.88" for 100-Year Storm event
 Inflow = 1.32 cfs @ 12.07 hrs, Volume= 4,716 cf
 Outflow = 1.26 cfs @ 12.15 hrs, Volume= 3,520 cf, Atten= 5%, Lag= 5.0 min
 Discarded = 0.04 cfs @ 12.15 hrs, Volume= 2,187 cf
 Primary = 1.22 cfs @ 12.15 hrs, Volume= 1,332 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 17.68' @ 12.15 hrs Surf.Area= 821 sf Storage= 1,685 cf

Plug-Flow detention time= 180.8 min calculated for 3,520 cf (75% of inflow)
 Center-of-Mass det. time= 92.3 min (832.1 - 739.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	14.50'	737 cf	11.17'W x 73.50'L x 3.54'H Field A 2,907 cf Overall - 1,065 cf Embedded = 1,841 cf x 40.0% Voids
#2A	15.00'	1,065 cf	Cultec R-330XL x 20 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 2 rows
		1,802 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.50'	1.020 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 11.00'
#2	Primary	17.45'	4.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Discarded OutFlow Max=0.04 cfs @ 12.15 hrs HW=17.68' (Free Discharge)
 ↑ **1=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=1.18 cfs @ 12.15 hrs HW=17.68' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 1.18 cfs @ 1.29 fps)

Proposed Conditions

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Type III 24-hr 100-Year Storm Rainfall=8.12"

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Pond P2: Cultec 330XL - Chamber Wizard Field A

Chamber Model = Cultec R-330XL (Cultec Recharger® 330XL - DISCONTINUED, Use R-330XLHD for new designs)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 2 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

2 Rows x 52.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 11.17' Base Width

6.0" Stone Base + 30.5" Chamber Height + 6.0" Stone Cover = 3.54' Field Height

20 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 2 Rows = 1,065.5 cf Chamber Storage

2,906.8 cf Field - 1,065.5 cf Chambers = 1,841.3 cf Stone x 40.0% Voids = 736.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,802.0 cf = 0.041 af

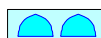
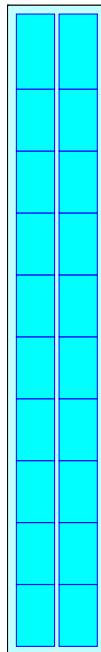
Overall Storage Efficiency = 62.0%

Overall System Size = 73.50' x 11.17' x 3.54'

20 Chambers

107.7 cy Field

68.2 cy Stone



Proposed Conditions

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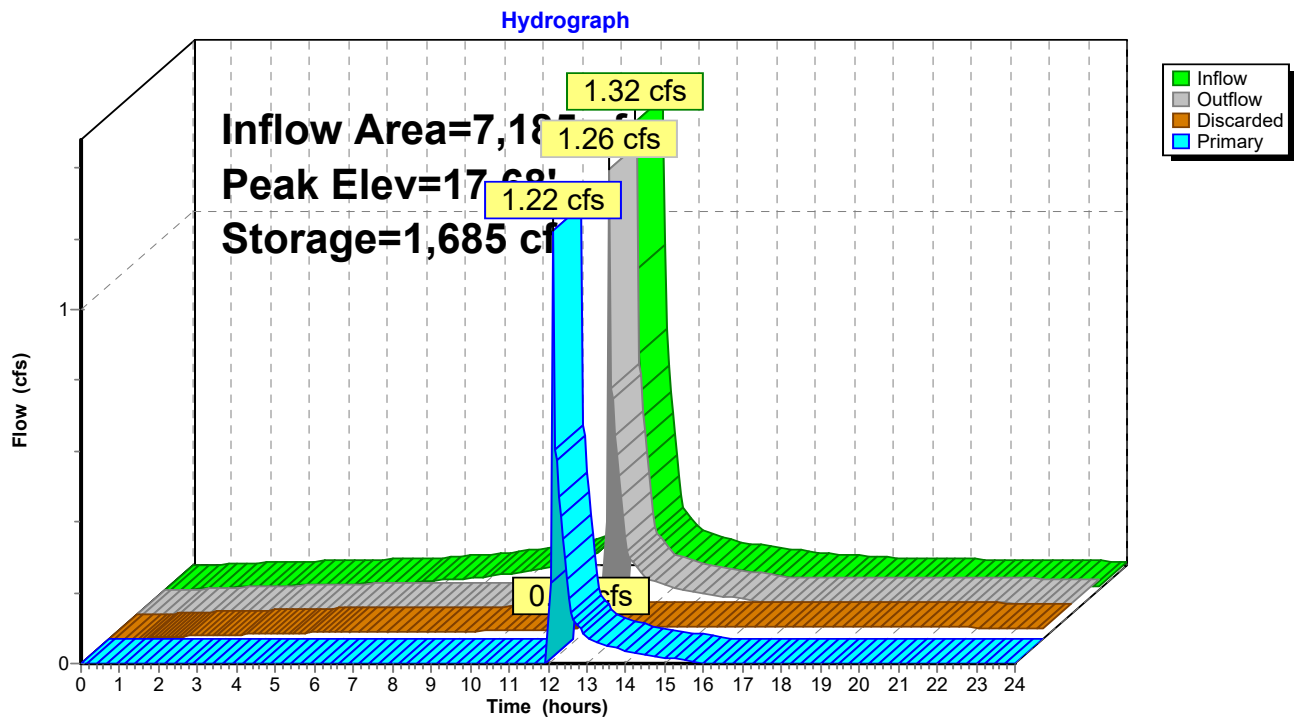
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Type III 24-hr 100-Year Storm Rainfall=8.12"

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Pond P2: Cultec 330XL



APPENDIX C

**Stormwater Checklist
Supplemental BMP Calculations
Illicit Discharge Statement**



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.

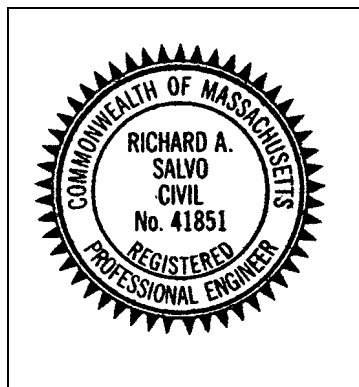
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



3/12/2021

Signature and Date

Checklist

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

- ☒ New development
- ☐ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

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

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

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 Field¹
- ☐ 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.

Project: Proposed Mixed Use Building
Client: Maximos Hatziliades
Project Number: 09-27801

Prepared By: EJB
Checked By: RAS
Date: 03/12/21



STANDARD 3: REQUIRED RECHARGE VOLUME - Porous Asphalt (P1)

$$R_v = F \times \text{impervious area}$$

R_v = Required Recharge Volume

F = Target Depth associated with each Hydrologic Soil Group

Impervious Area = total impervious area

Impervious Area: 11,874 sf = 0.27 acres

Hydrologic Group	Volume to Recharge
A	0.60
B	0.35
C	0.25
D	0.10

$$R_v = 0.27 \times 0.25 \times \frac{1 \text{ ft}}{12 \text{ in.}} \times \frac{43,560 \text{ sf}}{1 \text{ ac.}} = 247 \text{ CF}$$

NOTES:

1. Total storage capacity of the of subsurface infiltration facility (18" stone bed beneath porous asphalt). These value were taken from the HydroCAD model.

$$5,572 \text{ CF} > 247 \text{ CF}$$

DRAWDOWN WITHIN 72 HOURS

$$\text{Time}_{\text{drawdown}} = \frac{\text{Recharge Volume}}{K(\text{Bottom Area})} \quad K = \text{Saturated Hydraulic Conductivity}$$

$$\text{Time}_{\text{drawdown}} = \frac{5,572}{(1.02 \text{ in/hr})(1/12 \text{ ft/in})(11122 \text{ sf})} = 5.90 < 72 \text{ HRS}$$

NOTES:

1. K value is for sandy loam as shown in Table 2.3.3, entitled "1982 Rawls Rates," in the MADEP Stormwater Management Standards.

2. Bottom Area is equal to the total bottom area of the proposed chamber system.

Project: Proposed Mixed Use Building
Client: Maximos Hatziliades
Project Number: 09-27801

Prepared By: EJB
Checked By: RAS
Date: 03/12/21



STANDARD 4: WATER QUALITY - Porous Asphalt (P1)

WATER QUALITY TREATMENT VOLUME

$$V_{WQ} = (D_{WQ} \text{ in.} / 12 \text{ inches/foot}) \times (A_{IMP} \times 43,560 \text{ square feet/acre})$$

V_{WQ} = Required Water Quality Volume (in cubic feet)
 D_{WQ} = Water Quality Depth
 A_{IMP} = Impervious Area (in acres)

$$V_{WQ} = (0.5 \text{ in.} / 12 \text{ inches/foot}) \times (0.27 \times 43,560 \text{ square feet/acre}) = \boxed{490 \text{ CF}}$$

Stormwater BMP	Volume
Cultec 330XLHD Chambers	5,572
Total	5,572

NOTES:

1. Storage volume for the stormwater BMPs obtained from the hydrologic model created in HydroCAD

CONCLUSION:

1. The storage volume provided by the proposed BMPs is greater than the required water quality treatment volume. 5,572 CF > 490 CF

Project: Proposed Mixed Use Building
Client: Maximos Hatziliades
Project Number: 09-27801

Prepared By: EJB
Checked By: RAS
Date: 03/12/21



STANDARD 3: REQUIRED RECHARGE VOLUME - Cultec 330XLHD Chambers (P2)

$$R_v = F \times \text{impervious area}$$

R_v = Required Recharge Volume

F = Target Depth associated with each Hydrologic Soil Group

Impervious Area = total impervious area

Impervious Area: 7,185 sf = 0.16 acres

Hydrologic Group	Volume to Recharge
A	0.60
B	0.35
C	0.25
D	0.10

$$R_v = 0.16 \times 0.25 \times \frac{1 \text{ ft}}{12 \text{ in.}} \times \frac{43,560 \text{ sf}}{1 \text{ ac.}} = 150 \text{ CF}$$

NOTES:

1. Total storage capacity of the of subsurface infiltration facility (2 rows of 10 Cultec 330XLHD chambers). These value were taken from the HydroCAD model.

$$1,802 \text{ CF} > 150 \text{ CF}$$

DRAWDOWN WITHIN 72 HOURS

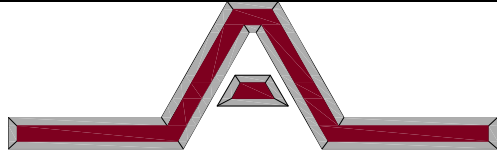
$$\text{Time}_{\text{drawdown}} = \frac{\text{Recharge Volume}}{K(\text{Bottom Area})} \quad K = \text{Saturated Hydraulic Conductivity}$$

$$\text{Time}_{\text{drawdown}} = \frac{1,802}{(1.02 \text{ in/hr})(1/12 \text{ ft/in})(821 \text{ sf})} = 25.82 < 72 \text{ HRS}$$

NOTES:

1. K value is for sandy loam as shown in Table 2.3.3, entitled "1982 Rawls Rates," in the MADEP Stormwater Management Standards.

2. Bottom Area is equal to the total bottom area of the proposed chamber system.



Engineering Alliance, Inc.

Civil Engineering & Land Planning Consultants
 194 Central Street
 Saugus, MA 01906
 Tel: (781) 231-1349
 Fax: (781) 417-0020

1950 Lafayette Road
 Portsmouth, NH 03801
 Tel: (603) 610-7100
 Fax: (603) 610-7101

TSS Removal Calculations

Name:	Mixed Use Building	Proj. No.:	09-27801
	Watertown, MA	Date:	3/12/2021
Client:	Maximos Hatziliades	Computed by:	EJB
County:	South Middlesex	Checked by:	RAS
Systems:	Porous Asphalt Driveway/Parking Area		

A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Pervious Asphalt Stone Bed	80	1.00	0.8	0.20
*Permeable Pavers achieve 80% removal when bed is sized to hold 0.5" or 1" WQV and drain within 72 hours				
Total TSS Removal=			80%	
Notes:				
*Starting TSS Load for first BMP= 1.00. TSS load for subsequent BMP's is equal to the Remaining Load (E) from the previous BMP.				

ILLICIT DISCHARGE COMPLIANCE STATEMENT

In accordance with the Wetland Regulations found in 310 CMR 10.05(6) and the *Massachusetts Stormwater Handbook* published by the Massachusetts Department of Environmental Protection, the stormwater management system for the proposed project located at Arlington Street & Elm Street (Parcel ID: 1236 2 0) in Watertown, Massachusetts shall accept no illicit discharges. Illicit discharges are defined as discharges not entirely comprised of stormwater and include, but are not limited to, wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Engineering Alliance, Inc. has performed an investigation of the existing site conditions and did not find any illicit discharges. Prior to construction, additional investigations will take place to identify and remove any and all illicit discharges currently onsite. These actions include, without limitation, visual screening, dye or smoke testing, and the removal of any sources of illicit discharges to the stormwater management system.

Should any illicit discharges enter the stormwater management system after construction has been completed, immediate steps to remove the discharges and their source shall be taken to return the system to its proper working state.



Richard A. Salvo, P.E.
for Engineering Alliance, Inc.

3/12/2021

Date

APPENDIX D

BMP Operation and Maintenance Plan

BEST MANAGEMENT PLAN OPERATION AND MAINTENANCE PLAN

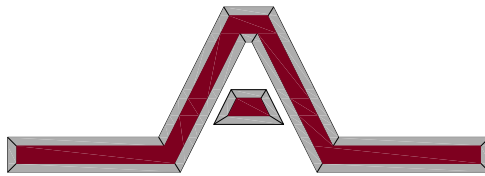
For The
Proposed Mixed Use building

located at
**Arlington Street & Elm Street
(Parcel ID: 1236 2 0)
Watertown, Massachusetts**

Submitted to:
**Town of Watertown
Conservation Commission
149 Main Street, Third Floor
Watertown, Massachusetts 02472**

Prepared for:
**Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472**

Prepared by



Engineering Alliance, Inc.

Civil Engineering & Land Planning Consultants	
194 Central Street	1950 Lafayette Road
Saugus, MA 01906	Portsmouth, NH 03801
Tel: (781) 231-1349	Tel: (603) 610-7100
Fax: (781) 417-0020	Fax: (603) 610-7101

March 12, 2021

BEST MANAGEMENT PRACTICES MAINTENANCE PLAN

A Best Management Practices Operations and Maintenance Plan is summarized below and will be incorporated into the construction documents for this project.

In accordance with the Storm Water Management Regulations issued by the Department of Environmental Protection (DEP), Engineering Alliance, Inc. has prepared the following best management practices maintenance plan for the proposed development of the property located off Arlington Street & Elm Street (Parcel ID: 1236 2 0) in Watertown, Massachusetts. This plan is broken into two major sections. The first section is construction-related erosion and sedimentation controls. The second section is devoted to a post-development operation and maintenance plan.

Basic Information

Owner: Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

Section 1 - Construction Activities

1. Contact the Town of Watertown at least three (3) days prior to start of construction.
2. Install haybales and silt fence to prevent sediment from leaving the subject property.
3. Install silt sacks in existing catch basins to prior to any construction.
4. The contractor shall only disturb the minimum area necessary.
5. Proper erosion and sediment control must be employed around all material stockpile areas and efficient. Regular provisions for dust control must be used, via a water truck or other acceptable method.
6. The entire project area shall be swept upon completion of construction and prior to removal of the erosion control devices.

Section 2 – Post Development Operation & Maintenance

1. Paved Areas (Bituminous Concrete) - Paved areas shall be swept by street sweepers periodically during dry weather to remove excess sediments, reducing the amount of sediments that the drainage system will have to remove from the runoff. Salt for de-icing on the paved areas during the winter months should be limited as much as possible, as this will reduce the need for removal and treatment. Sand containing the minimum amount of calcium chloride (or approved equivalent) needed for handling may be applied as part of the routine winter maintenance activities. **At a minimum all paved areas must be swept two times annually, in the fall and in the spring.**
2. Pervious Asphalt – Pervious asphalt areas should be maintained periodically to maintain infiltration. Care should be taken to keep sediment off the pavement during and after construction. Quarterly (4 times per year) cleaning by a vacuum-type street cleaner should be performed when the pavement is dry. Vacuum settings should be adjusted to prevent the uptake of aggregate in the pavement openings and joints. It is important to keep the drainage voids and joints filled with aggregate. Replenishment can be done, if needed, at the time of cleaning. Acceptable types of vacuum sweepers include the Elgin Whirlwind and the Allianz Model 650

If the pavement surface has become significantly clogged such that routine vacuum sweeping does not restore permeability, then a more intensive level of treatment may be required. The porous pavement areas shall be washed with clean, low pressure water, followed by immediate vacuuming. Combinations of washing and vacuuming techniques have proved effective in cleaning both organic clogging as well as sandy clogging. Research has found that a “power head cone nozzle” that “concentrated the water in a narrowly rotating cone” worked best. (Note: if the pressure of the washing nozzle is too great, contaminants may be driven further into the porous surface.) Maintenance crews are encouraged to determine the most effective strategy of cleaning their porous installations.

Winter maintenance for a porous parking lot may be necessary, but is usually less intensive than that required for a standard asphalt lot. By its very nature, a porous pavement system with subsurface aggregate bed has superior snow melting characteristics than does standard pavement. Therefore, ice and light snow accumulation are generally not as problematic. However, snow will accumulate during heavier storms. Abrasives such as sand or cinders should not be applied on or adjacent to the porous pavement. Snow plowing is necessary for significant snow accumulation, but should be done carefully (i.e. by setting the blade slightly higher than usual, about an inch). Standard road salt is acceptable for use as a deicer on porous pavement, although a non-toxic, organic deicer, applied either as a blended, magnesium chloride-based liquid product or as pretreated rock salt, is 3 recommended. Acceptable liquid deicers include Magic-O, Ice B' Gone, Ice Ban, and Geomelt, among others. Magic Salt is an example of an acceptable pretreated salt product. Other acceptable deicer alternatives to standard sodium chloride include calcium chloride, magnesium chloride, potassium chloride, urea, and calcium magnesium acetate. Follow supplier recommendations when applying deicers to pavement

Repairs shall be made with porous as asphalt mix. If an area greater than 50 SF is in need of repair, approval of patch type must be sought from either the engineer or owner. Under no circumstance is the pavement surface to ever be seal coated. Any required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.

3. Subsurface Infiltration Facility –Subsurface Infiltration Facilities will be equipped with an inspection port in each row. When the lid is removed, a screw-in plug will be exposed. Remove the plug and measure the depth of sediment. If the sediment exceeds 3 inches in depth, the row should be cleaned with high pressure water through a culvert cleaning nozzle. Inlets and outlets should be periodically maintained to prevent clogging and maintain infiltration capacity.

Should the rear sub-surface infiltration facility become disturbed due to any required repairs to the municipal sewer system, the owner, at its own expense, shall repair the sub-surface system. Said repairs shall include, but not be limited to: replacing perforated pipe, re-establishing pipe invert, replacing washed stone, and replacing filter fabric.

4. Catch Basins– Catch basins shall be inspected monthly for the initial twelve-month period following the completion of the construction of the paved areas. Debris shall be removed from the catch basin grates, sumps and outlet pipes and disposed of in compliance with local, state and federal guidelines.

Upon a period beginning twelve months after the completion of the site, all catch basins shall be inspected and maintained twice annually, once in April and once in November. Debris shall be removed from the catch basin grates, sumps and outlet pipes and disposed of in compliance with local, state and federal guidelines.

5. Water Quality Manhole: Contech CDS unit with solid manhole covers should be maintained bi-annually, after a large rain event, and when sediment levels exceed maintenance volumes, as required by the manufacturer. At a minimum, water quality manholes shall be serviced every spring and fall.
6. Pesticides, Herbicides, and Fertilizers - Pesticides and herbicides shall not be used within the limits of the 100-foot buffer zone to any wetland resource areas as defined under 310 CMR 10.00. In addition, fertilizers that are used within this zone should be restricted to organic fertilizers only.
7. Snow removal and storage - Plowed snow shall be placed in the landscaped areas around the parking lot where it can slowly infiltrate. Sediments shall be removed from this area every spring. When the amount of snow exceeds the capacity of the snow storage area, it shall be removed from the site by a privately contracted company.
8. Maintenance Responsibilities - All post construction maintenance activities should be documented and kept on file and made available to the Town of Watertown upon request. All post construction maintenance activities shall run with the title of the property in perpetuity.



NOAA Atlas 14, Volume 10, Version 3
Location name: Watertown, Massachusetts, USA*
Latitude: 42.3676°, Longitude: -71.1879°
Elevation: 24.81 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.301 (0.236-0.383)	0.371 (0.291-0.474)	0.486 (0.381-0.622)	0.583 (0.453-0.750)	0.715 (0.538-0.970)	0.814 (0.601-1.13)	0.919 (0.659-1.33)	1.04 (0.703-1.54)	1.23 (0.794-1.88)	1.38 (0.872-2.16)
10-min	0.426 (0.334-0.542)	0.526 (0.413-0.671)	0.690 (0.539-0.883)	0.827 (0.642-1.07)	1.01 (0.763-1.37)	1.15 (0.851-1.60)	1.30 (0.934-1.89)	1.48 (0.995-2.18)	1.74 (1.13-2.66)	1.95 (1.24-3.06)
15-min	0.501 (0.393-0.638)	0.619 (0.485-0.789)	0.812 (0.635-1.04)	0.972 (0.755-1.25)	1.19 (0.897-1.62)	1.36 (1.00-1.88)	1.53 (1.10-2.22)	1.74 (1.17-2.57)	2.04 (1.32-3.13)	2.30 (1.45-3.60)
30-min	0.683 (0.536-0.870)	0.845 (0.663-1.08)	1.11 (0.867-1.42)	1.33 (1.03-1.71)	1.63 (1.23-2.22)	1.86 (1.37-2.59)	2.10 (1.51-3.05)	2.39 (1.61-3.53)	2.83 (1.83-4.34)	3.20 (2.03-5.01)
60-min	0.865 (0.679-1.10)	1.07 (0.840-1.37)	1.41 (1.10-1.80)	1.69 (1.31-2.17)	2.07 (1.56-2.82)	2.36 (1.74-3.29)	2.67 (1.92-3.89)	3.04 (2.05-4.49)	3.61 (2.34-5.54)	4.11 (2.60-6.43)
2-hr	1.13 (0.894-1.43)	1.40 (1.10-1.77)	1.83 (1.44-2.33)	2.19 (1.71-2.81)	2.69 (2.04-3.64)	3.06 (2.28-4.24)	3.46 (2.52-5.03)	3.96 (2.68-5.80)	4.75 (3.09-7.22)	5.44 (3.45-8.43)
3-hr	1.32 (1.05-1.66)	1.63 (1.29-2.05)	2.13 (1.68-2.70)	2.55 (2.00-3.25)	3.12 (2.38-4.20)	3.54 (2.65-4.90)	4.01 (2.93-5.80)	4.59 (3.11-6.70)	5.52 (3.59-8.34)	6.33 (4.03-9.76)
6-hr	1.71 (1.37-2.14)	2.10 (1.68-2.63)	2.74 (2.18-3.44)	3.27 (2.58-4.14)	4.00 (3.06-5.34)	4.53 (3.41-6.21)	5.12 (3.75-7.34)	5.86 (3.99-8.46)	7.02 (4.59-10.5)	8.03 (5.12-12.3)
12-hr	2.18 (1.75-2.71)	2.67 (2.15-3.33)	3.48 (2.78-4.34)	4.14 (3.29-5.20)	5.06 (3.90-6.70)	5.74 (4.33-7.78)	6.48 (4.76-9.18)	7.39 (5.05-10.6)	8.80 (5.77-13.0)	10.0 (6.42-15.1)
24-hr	2.62 (2.12-3.24)	3.25 (2.63-4.02)	4.28 (3.45-5.31)	5.13 (4.11-6.40)	6.31 (4.89-8.29)	7.17 (5.45-9.66)	8.12 (6.01-11.4)	9.30 (6.38-13.2)	11.1 (7.33-16.4)	12.8 (8.19-19.1)
2-day	3.00 (2.44-3.68)	3.79 (3.08-4.65)	5.08 (4.12-6.26)	6.15 (4.96-7.62)	7.63 (5.96-9.99)	8.71 (6.67-11.7)	9.90 (7.41-13.9)	11.5 (7.88-16.1)	14.0 (9.20-20.3)	16.2 (10.4-23.9)
3-day	3.30 (2.70-4.03)	4.15 (3.39-5.08)	5.55 (4.51-6.81)	6.71 (5.42-8.28)	8.31 (6.51-10.8)	9.47 (7.28-12.7)	10.8 (8.09-15.1)	12.5 (8.60-17.4)	15.2 (10.1-22.0)	17.7 (11.4-26.0)
4-day	3.57 (2.93-4.35)	4.46 (3.65-5.44)	5.90 (4.82-7.22)	7.10 (5.76-8.74)	8.76 (6.88-11.4)	9.96 (7.68-13.3)	11.3 (8.51-15.8)	13.1 (9.03-18.2)	15.9 (10.5-22.9)	18.5 (11.9-27.0)
7-day	4.33 (3.57-5.25)	5.25 (4.33-6.37)	6.76 (5.54-8.22)	8.01 (6.53-9.79)	9.73 (7.68-12.5)	11.0 (8.49-14.5)	12.4 (9.33-17.1)	14.2 (9.85-19.6)	17.1 (11.4-24.4)	19.7 (12.8-28.7)
10-day	5.03 (4.16-6.07)	5.97 (4.94-7.22)	7.52 (6.19-9.11)	8.80 (7.19-10.7)	10.6 (8.35-13.5)	11.9 (9.18-15.5)	13.3 (9.99-18.2)	15.1 (10.5-20.7)	18.0 (12.0-25.5)	20.5 (13.3-29.6)
20-day	7.05 (5.87-8.45)	8.07 (6.71-9.68)	9.74 (8.07-11.7)	11.1 (9.15-13.5)	13.0 (10.3-16.4)	14.5 (11.2-18.6)	16.0 (11.9-21.2)	17.7 (12.4-24.0)	20.2 (13.5-28.4)	22.3 (14.5-31.9)
30-day	8.71 (7.28-10.4)	9.79 (8.18-11.7)	11.6 (9.61-13.8)	13.0 (10.8-15.7)	15.0 (11.9-18.8)	16.6 (12.8-21.1)	18.1 (13.5-23.8)	19.8 (13.9-26.7)	22.1 (14.8-30.7)	23.9 (15.5-33.9)
45-day	10.8 (9.05-12.8)	11.9 (10.0-14.2)	13.8 (11.5-16.5)	15.3 (12.7-18.4)	17.5 (13.9-21.6)	19.1 (14.8-24.1)	20.8 (15.4-26.9)	22.4 (15.8-29.9)	24.4 (16.4-33.7)	25.9 (16.9-36.5)
60-day	12.5 (10.6-14.8)	13.7 (11.5-16.3)	15.7 (13.1-18.6)	17.3 (14.4-20.7)	19.5 (15.5-24.0)	21.2 (16.5-26.6)	22.9 (17.0-29.4)	24.5 (17.3-32.6)	26.4 (17.8-36.3)	27.7 (18.1-38.9)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

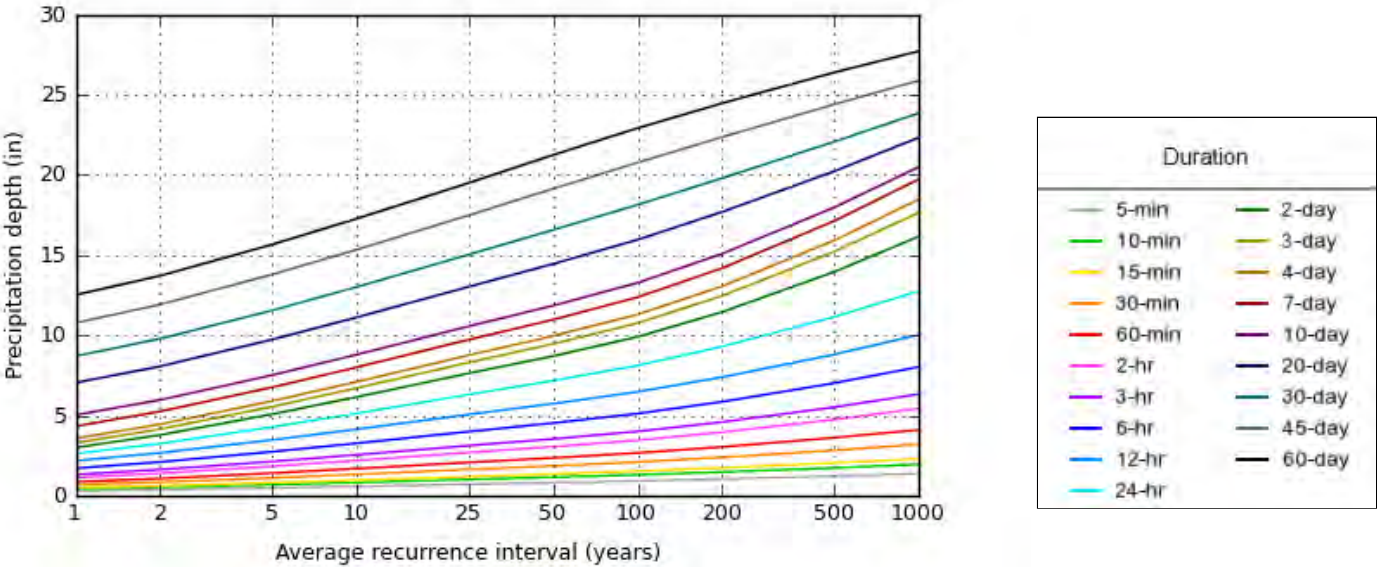
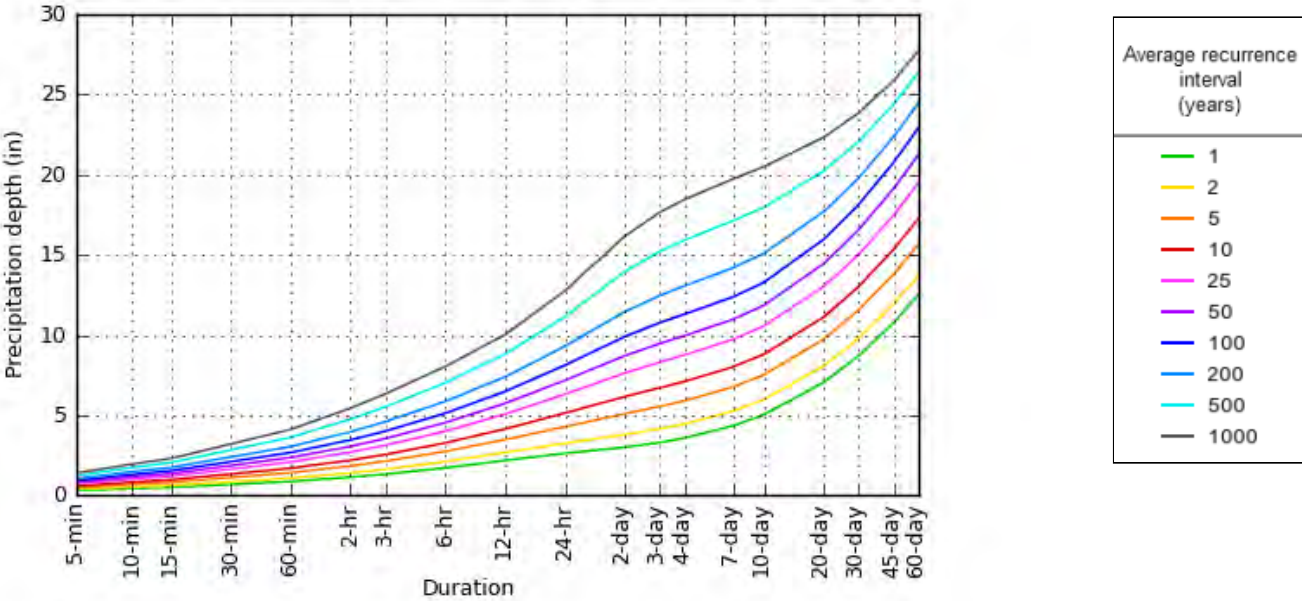
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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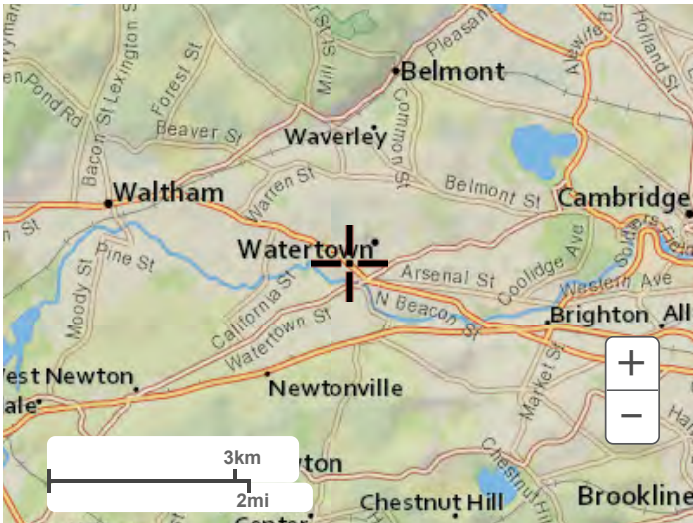
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 42.3676°, Longitude: -71.1879°



Maps & aerals

Small scale terrain



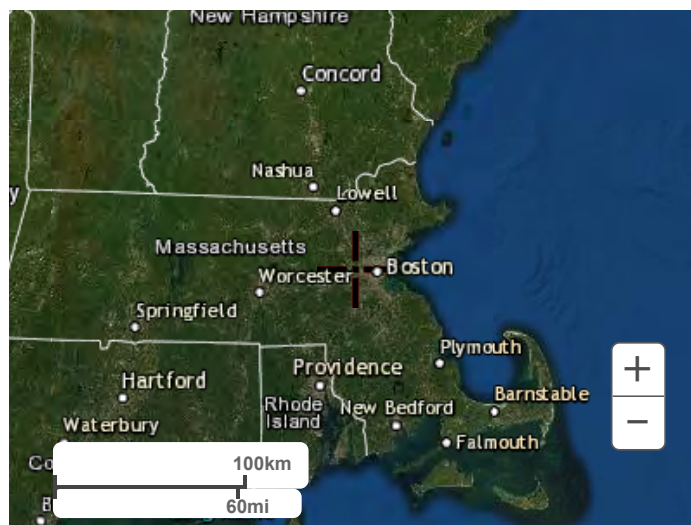
Large scale terrain



Large scale map



Large scale aerial



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[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

APPENDIX G

Detailed Wildlife Habitat Evaluation



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

Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 1. Summary Sheet

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



Williams Environmental Permitting

Project Name

0 Arlington St, Watertown, MA

Location

7,150 sqft

Size of Area Being Impacted

2/22/2021

Date

Impact Areas (linear feet, square feet, or acres for each of the impact areas within the site)

Name	Waterbody/ Waterway	Wetland	Upland*	Total Area
1. Mixed Use Building & portion of porous asphalt		4,215 sf		4,215 sf
2.				
3.				
4.				
5.				
6.				
7.				

*Riverfront Area/BLSF

Attach Sketch map and/or photos of the Impact Areas

Narrative Description of Site (attach separate page if necessary)

This site is located between both Arlington Street and Elm Street in Watertown, MA. The site is surrounded by urban development, and consists of forested wetlands and uplands with large amounts of trash and other debris scattered through out. The entire parcel is within Riverfront Area to a perennial stream which flows east through the center of the parcel, feeding Sawins Pond off-site to the east of Arlington Street. Vegetation was recently maintained within upland areas at the northern limit of the site.

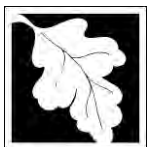
Certification

I hereby certify that this project has been designed to avoid, minimize, and mitigate adverse effects on wildlife habitat, and that it will not, following two growing seasons of project completion and thereafter, substantially reduce its capacity to provide important wildlife habitat functions.

Signature of Wildlife Specialist (per 310 CMR 10.60 (1) (b))

Francis Hoey

Typed or Printed Name



Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 2. Field Data Form (for each wetland or non-wetland resource area)

I. General Information

Williams Environmental Permitting

Project Location (from NOI page 1)

0 Arlington Street, Watertown (Assessors Map 1236-2-0)

Impact Area (number/name)

2/22/2021

Date(s) of Site Visit(s) and Data Collection

Overcast with slight showers, 30-35° F, 3-5" of snow covering the entire site

Weather Conditions During Site Visit (if snow cover, include depth)

Francis Hoey

2/22/2021

Person completing form per 310 CMR 10.60(1)(b)

Date this form was completed

The information on this data sheet is based on my observations unless otherwise indicated

Signature

II. Site Description (complete A or B under Classification - see instructions for full description)

A. Classification

1. For Wetland Resource Areas, complete the following:

System: Palustrine

Subsystem: None

Class: Forested Wetland

Subclass: Broad-leaved deciduous

Hydrology/Water Regime

☐ Permanently flooded

☒ Saturated

☐ Intermittently exposed

☐ Temporarily flooded

☐ Semi-permanently flooded

☐ Intermittently flooded

☐ Seasonally flooded

☐ Artificially flooded

2. For Riverfront or Bordering Land Subject to Flooding Resource Areas, complete the following.

Use a terrestrial classification system such as one of the two listed below:

a. "Classification of the Natural Communities of Massachusetts (Draft)" by Patricia C. Swain and Jennifer B. Kearsley, MA DFW NHESP, Westborough, MA. July 2000. ([Department of Fish & Game Website](#))

b. "New England Wildlife: Habitat, Natural History, and Distribution" by Richard M. DeGraaf and Deborah D. Rudis, USDA Forest Service, Northeastern Forest Experiment Station. General Technical Report NE-108. August 1992. 491 pages.

Alluvial Red Maple Swamp

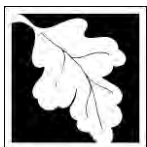
Community Name

Primarily *Acer rubrum*, and *Salix nigra* with an understory of *Cornus amomum*, and *Rhamnus* sp.

Vegetation Description

Riverfront area is completely surrounded by urban developments on all sides.

Physical Description



Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 2. Field Data Form (continued)

B. Inventory (Plant community)

% Cover: 75 80 5 0 40
Trees (> 20') Shrubs (< 20') Woody vines Mosses Herbaceous

Plant Lists (species that comprise 10% or more of the vegetative cover in each strata; "*" designates a dominant plant species for the strata):

Strata	Plant Species	Strata	Plant Species
Trees	<u>Quercus rubra*</u>	Shrubs	<u>Cornus amomum*</u>
Trees	<u>Catalpa speciosa</u>	Herbaceous	<u>Typha latifolia*</u>
Trees	<u>Acer rubrum*</u>	Herbaceous	<u>Rubus allegheniensis*</u>
Trees	<u>Salix nigra*</u>	Herbaceous	<u>Juncus effusus*</u>
Shrubs	<u>Ailanthus altissima*</u>	Herbaceous	<u>Onoclea sensibilis*</u>
Shrubs	<u>Rhamnus cathartica*</u>	Herbaceous	<u>Reynoutria japonica</u>

C. Inventory (Soils)

<u>602-Urban Land</u>	<u>Well Drained</u>
<u>Soil Survey Unit</u>	<u>Drainage Class</u>
<u>Fine sandy loam</u>	<u>12</u>
<u>Texture (upper part)</u>	<u>Depth</u>
<u>Fine Sand</u>	
<u>Depth to Water Table</u>	

III. Important Habitat Features (complete for all resource areas)

If the following habitat characteristics are present, describe & quantify them on a separate sheet & attach.

Wildlife Food

Important Wetland/Aquatic Food Plants (smartweeds, pondweeds, wild rice, bulrush, wild celery)

☐ Abundant ☐ Present ☒ Absent

Important Upland/Wetland Food Plants (hard mast and fruit/berry producers)

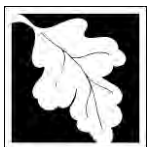
☐ Abundant ☐ Present ☒ Absent

Shrub thickets or streambeds with abundant earthworms (American woodcock)

☐ Present ☒ Absent

Shrub and/or herbaceous vegetation suitable for veery nesting

☒ Present ☐ Absent



Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 2. Field Data Form (continued)

Number of trees (live or dead) > 30" DBH: 0

Number (or density) of Standing Dead Trees (potential for cavities and perches):

<u>2</u>	<u>0</u>	<u>0</u>
6-12" dbh	12-18" dbh	18-24" dbh
		> 24" dbh

Number of Tree Cavities in trunks or limbs of:

0
6-12" diameter (e.g., tree swallow, saw whet owl, screech owl, bluebird, other songbirds)

0
12-18" diameter (e.g., hooded merganser, wood duck, common goldeneye, mink)

0
>18" diameter (e.g., hooded merganser, wood duck, common goldeneye, common merganser, barred owl, mink, raccoon, fisher)

Small mammal burrows

☐ Abundant ☐ Present ☒ Absent

Cover/Perches/Basking/Denning/Nesting Habitat

☒ Dense herbaceous cover (voles, small mammals, amphibians & reptiles)

☒ Large woody debris on the ground (small mammals, mink, amphibians & reptiles)

☐ Rocks, crevices, logs, tree roots or hummocks under water's surface (turtles, snakes, frogs)

☒ Rocks, crevices, fallen logs, overhanging branches or hummocks at, or within 1m above the water's surface (turtles, snakes, frogs, wading birds, wood duck, mink, raccoon)

☐ Rock piles, crevices, or hollow logs suitable for:

☐ otter ☐ mink ☐ porcupine ☐ bear ☐ bobcat ☐ turkey vulture

☐ Live or dead standing vegetation overhanging water or offering good visibility of open water (e.g., osprey, kingfisher, flycatchers, cedar waxwings)

Depressions that may serve as seasonal (vernal/autumnal) pools

☐ Present ☒ Absent

Standing water present at least part of the growing season, suitable for use by

☐ Breeding amphibians ☒ Non-breeding amphibians (foraging, re-hydration)

☐ Turtles ☐ Foraging waterfowl

Sphagnum hummocks or mats, moss-covered logs or saturated logs, overhanging or directly adjacent to pools of standing water in spring (four-toed salamander)

☐ Present ☒ Absent



Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 2. Field Data Form (continued)

Important habitat characteristics (if present, describe and quantify them on a separate sheet)

Medium to large (> 6"), flat rocks within a stream (cover for stream salamanders and nesting habitat for spring & two-lined salamanders)

☐ Present ☒ Absent

Flat rocks and logs on banks or within exposed portions of streambeds (cover for stream salamanders and nesting habitat for dusky salamanders)

☐ Present ☒ Absent

Underwater banks of fine silt and/or clay (beaver, muskrat, otter)

☐ Present ☒ Absent

Undercut or overhanging banks (small mammals, mink, weasels)

☐ Present ☒ Absent

Vertical sandy banks (bank swallow, kingfisher)

☐ Present ☒ Absent

Areas of ice-free open water in winter

☐ Present ☒ Absent

Mud flats

☐ Present ☒ Absent

Exposed areas of well-drained, sandy soil suitable for turtle nesting

☐ Present ☒ Absent

Wildlife dens/nests (if present, describe & quantify them on the back of this sheet)

Turtle nesting sites

☐ Present ☒ Absent

Bank swallow colony

☐ Present ☒ Absent

Nest(s) present of

☐ Bald Eagle

☐ Osprey

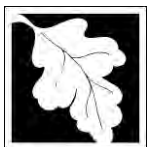
☐ Great Blue Heron

Den(s) present of

☐ Otter

☐ Mink

☐ Beaver



Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 2. Field Data Form (continued)

Project area is within:

- ☐ 100' of beaver, mink or otter den, bank swallow colony or turtle nesting area
- ☐ 200' of Great Blue Heron or osprey nest(s)
- ☐ 1400' of a Bald Eagle nest¹

Emergent Wetlands (if present, describe & quantify them on a separate sheet)

Emergent wetland vegetation at least seasonally flooded during the growing season (wood duck, green heron, black-crowned night heron, king rail, Virginia rail, coot, etc.)

Flooded > 5 cm ☐ Present ☒ Absent

Flooded > 25 cm (pied-billed grebe) ☐ Present ☒ Absent

Persistent emergent wetland vegetation at least seasonally flooded during the growing season (mallard, American bittern, sora, common snipe, red-winged blackbird, swamp sparrow, marsh wren)

Flooded > 5 cm ☐ Present ☒ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☒ Absent

Cattail emergent wetland vegetation at least seasonally flooded during the growing season

Flooded > 5 cm (marsh wren) ☐ Present ☒ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☒ Absent

Fine-leaved emergent vegetation (grasses and sedges) at least seasonally flooded during the growing season (common snipe, spotted sandpiper, sedge wren)

Flooded > 5 cm ☐ Present ☒ Absent

Flooded > 25 cm (least bittern, common moorhen) ☐ Present ☒ Absent

IV. Landscape Context

A. **Habitat Continuity** (if present, describe the landscape context on a separate sheet and its importance for area-sensitive species)

- | | | | |
|---|---------------------|------------------------------|--|
| Is the impact area part of an emergent marsh at least | 1.0 acre in size? | ☐ Yes | ☒ No |
| (marsh and waterbirds) | 2.0 acres in size? | ☐ Yes | ☒ No |
| | 5.0 acres in size? | ☐ Yes | ☒ No |
| | 10.0 acres in size? | ☐ Yes | ☒ No |

¹ 1400 feet is the distance used by NHESP for evaluating potential disturbance impacts on eagle nests under MESA. Keep in mind, however, that this doesn't give jurisdiction within 1400' of an eagle's nest; it only identifies it on the checklist so that adverse effects can be avoided if work in a resource area is within 1400 feet.



Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 2. Field Data Form (continued)

Is the impact area part of a wetland complex at least	2.5 acres in size?	☐ Yes	☒ No
(turtles, frogs, waterfowl, mammals)	5.0 acres in size?	☐ Yes	☒ No
	10.0 acres in size?	☐ Yes	☒ No
	25.0 acres in size?	☐ Yes	☒ No
For upland resource areas is the impact area part of contiguous forested habitat at least			
(forest interior nesting birds)	50 acres in size?	☐ Yes	☒ No
	100 acres in size?	☐ Yes	☒ No
	250 acres in size?	☐ Yes	☒ No
	500 acres in size?	☐ Yes	☒ No
(grassland nesting birds)	> 1.0 acre in size?	☐ Yes	☒ No
(special habitat such as gallery floodplain forest, alder thicket, etc.)	> 1.0 acre in size?	☐ Yes	☒ No

B. Connectivity with adjoining natural habitats

- ☐ No direct connections to adjacent areas of wildlife habitat (little connectivity function)
- ☐ Connectors numerous or impact area is embedded in a large area of natural habitat (limited connectivity function)
- ☐ Impact area contributes to a limited number of connectors to adjacent areas of habitat (somewhat important for connectivity function)
- ☒ Impact area serves as *part of* a sole connector to adjacent areas of habitat (important for connectivity function)
- ☐ Impact area serves as *only* connector to adjacent areas of habitat (very important for connectivity function)

V. Habitat Degradation (describe degradation and wildlife impacts on the back of the sheet)

- ☒ Evidence of significant chemical contamination
- ☒ Evidence of significant levels of dumping
- ☒ Evidence of significant erosion or sedimentation problems
- ☒ Significant invasion of exotic plants (e.g., purple loosestrife, *Phragmites*, glossy buckthorn)
- ☒ Disturbance from roads or highways
- ☒ Other human disturbance
- ☐ Is the site the only resource area in the vicinity of an otherwise developed area

Note: These are not the only important habitat features that may be observed on a site. If the wildlife specialist identifies other features they should be noted in the application.



Wildlife Habitat Protection Guidance

Appendix B: Detailed Wildlife Habitat Evaluation

Part 2. Field Data Form (continued)

VI. Quantification Table for Important Habitat Characteristics

Habitat Characteristic	Amount Impacted in Impact Area	Current (entire site)	Post-Construction (entire site)
Example: standing dead trees 6-12" dbh	4	12	8
Standing dead tress	2	7	5
Cover habitat for small-medium mammals, nesting habitat for birds, habitat corridor. no stream impacts	4,215 sf	7,930 sf	3,715+6,390 sf of BVW mitigation

The logo for SWCA is positioned vertically on the left side of the page. It consists of the letters 'S', 'W', 'C', and 'A' in a large, stylized, light blue font. The letters are stacked vertically, with the 'S' at the bottom and the 'A' at the top. The 'W' and 'C' are in the middle, and they are all connected in a continuous, flowing manner.

Notice of Intent Parking Lot Development Watertown, Massachusetts

DECEMBER 2023

PREPARED FOR
Maximos Hatziliades

PREPARED BY
SWCA Environmental Consultants

NOTICE OF INTENT PARKING LOT DEVELOPMENT

Prepared for

Maximos Hatziliades
71 Arlington Street
Watertown, Massachusetts 02472

Prepared by

SWCA Environmental Consultants
153 Cordaville Road, Suite 130
Southborough, MA 01772
(413) 256-0202
www.swca.com

SWCA Project No. 66582

December 2022

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Appendices

Appendix A.	Watertown NOI Checklist, Watertown NOI Application for Permit, and Watertown Fee Calculation and Transmittal Form
Appendix B.	WPA form 3 and Copies of checks
Appendix C.	USGS Site Locus, FEMA Mapping, Design Plan
Appendix D.	Site Photographs
Appendix E.	Certified List of Abutters, Abutter Notification, Affidavit of Service
Appendix F.	Stormwater Checklist and Report

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) is filing a Notice of Intent (NOI) on behalf of Maximos Hatziliades (Applicant) for the development of a parking lot at 0 Arlington Street in Watertown, Massachusetts (the Project). This NOI is being submitted in accordance with the Massachusetts Wetlands Protection Act (M.G.L. c.131, §40) (WPA), its implementing regulations (310 CMR 10.00 et seq.), and the Watertown Wetlands Protection Ordinance and its implementing regulations. Completed Town of Watertown Application forms are included in Appendix A. A completed “WPA Form 3” is included in Appendix B.

The NOI proposes the construction of approximately 41,289 square feet (sf) of pervious parking area along the northern part of the parcel. Specifically, the Project proposes to grade and pave the north side of Sawins Pond extending from the existing paved parking lot, off Arlington Street, to Coolidge Avenue. In addition, the Project will include landscaping around the parking area and will enhance the Buffer Zone between the newly constructed parking area and the existing resource area with native plantings. Portions of the Project are proposed within the 100-foot Buffer Zone of Bordering Vegetated Wetlands (BVW) and Inland Bank, and locally regulated 150-foot Buffer Zone only. Please refer to Figure 1 in Appendix C depicting the Project area on an U.S. Geological Survey (USGS) topographic map along with site design plans.

In 2011, the applicant submitted a proposal for a similar project (DEP# 321-0145), for which the Watertown Conservation Commission issued an Order of Conditions on June 14, 2011. However, the Order of Conditions expired prior to commencement of the project. A Certificate of Compliance (Invalid Order) was issued by the Watertown Conservation Commission on July 20, 2021 for DEP# 321-0145. In 2019 SWCA prepared an Abbreviated Notice of Resource Area Delineation (ANRAD), DEP# 321-0168, which included the area in which the proposed site is located. An Order of Resource Area Delineation was issued on August 7, 2019. Amid the COVID-19 pandemic, Massachusetts issued an emergency order which suspended state permitting deadlines and extended validity of state permits. This allowed permits to be extended an additional 462 from their expiration date. Therefore, the ORAD is valid until November 12, 2023.

This project is being filed in accordance with 310 CMR 10.53(1). One original and six (6) hard copies of this NOI are being submitted to the Watertown Conservation Commission, one copy is sent to the Town Engineer, and a copy is being mailed to the Massachusetts Department of Environmental Protection (DEP) Northeast Regional Office. SWCA is notifying all abutters within 300 feet of the subject parcel. Certified list of abutters, a copy of the Abutters Notification Form, and Affidavit of Service is attached in Appendix E. Enclosed is a check of \$1,000 made out to the Town of Watertown for the local filing fee under Section III(G) in accordance with Watertown Wetland Ordinance Rules and Regulations and a check for \$262.50 for the local portion of the WPA filing fee for a Category 2b. project. The Commonwealth’s portion of \$237.50 will be sent to DEP. Copies of the checks can be found in Appendix B.

2 SITE DESCRIPTION

2.1 Existing Conditions

The Sawins Pond parcel is 4.97 acres and is located between Arlington Street and Coolidge Avenue. The parcel is located in a mixed industrial, commercial, and residential area of Watertown. On the western side of the parcel, a perennial stream, Williams Brook, flows under Arlington Street and daylight on the

western side of the parcel before flowing into Sawins Pond. A dam is located on the southern end of Sawins Pond near Coolidge Avenue, which impounds flow and creates Sawins Pond.

The northwestern side of the property, adjacent to Arlington Street, consists of an existing paved parking area. The area between the existing parking lot and Coolidge Avenue, is a previously disturbed site, consisting primarily of mugwort (*Artemisia vulgaris*), grass species, and a Staghorn sumac (*Rhus hirta*) saplings. A chain linked fence separated the property from Coolidge Avenue and the commercial property to the north. Saplings of Staghorn sumac are located predominantly along the fence line by Coolidge Avenue and the northern portion of the property. An access road, consisting of compact soil, spans between the existing paved parking area and gate along Coolidge Avenue. The northern portion of the property is relatively flat. A steep slope, vegetated with trees, separates the herbaceous northern side of the parcel from Sawins Pond. The Pond bank is located at the toe of the slope. Two BVWs are located on the southern bank of the pond and one BVW is located on the northern bank along a portion of Williams Brook, outside of the Project area. There are no wetlands located along the northern bank of the pond between the proposed Project area and the bank. Representative photographs of the Site are included in Appendix D.

According to the Federal Emergency Management Agency (FEMA) Floodplain Insurance Rate Maps (FIRMs) (Map Nos. 25017C0557E, dated June 4, 2010) (FEMA 2010), the Site is not within mapped FEMA floodplain. FEMA Floodplain Maps are included in Appendix C.

2.2 Site History

Sawins Pond was created in the late 1800's along with Williams Pond, which is no longer present. The ponds were developed by George W. Sawin as part of a resort for recreational purposes and can be seen in historical maps dating to at least 1889. When the resort went out of business in the early 1900's, the ponds were purchased by the Hood Rubber Company (Hood). The Hood Rubber Company property is described as being extensive and encompassing the Sawins and Williams Pond and extending west between Arsenal Street on the south and Dexter Street to the North (Vineyard 2008a). Hood became the largest manufacturer of rubber products in the world at one time and used the ponds as a source of cooling water for the plant and as a disposal location for their wastewater. The Hood Rubber Company was later acquired by B.F. Goodrich Corporation in 1929.

2.3 Regulated Resource Areas

Through the ANRAD process and with the issuance of the ORAD (DEP# 321-0168), jurisdictional resources areas at Sawins Pond were confirmed; including the northern and southern bank of Sawins Pond and the location Bordering Vegetated Wetlands (BVW) associated with Sawins Pond. Land Under Water is associated with the open water areas at this parcel. Both Bank and BVW have a 100-foot buffer zone under the Massachusetts Wetland Regulations and a 150-foot Buffer Zone pursuant to the Watertown Wetlands Ordinance. In addition, Watertown regulates the first 50-feet of any bank, wetland, pond as a 50-foot No Build Zone, in which no person shall build or enlarge any structures, parking lot or impervious surface.

As part of the ANRAD process and confirmation of jurisdictional resource areas at Sawins Pond, it was determined that the portion of open water from the culvert at Arlington Street and approximately 200-feet east is considered a perennial stream. This portion of the open water, therefore, has an associated Riverfront Area (RFA). The remaining open water is considered a pond and does not have an associated RFA. Sheet 1 of the Design Plan illustrates these resource areas and the limit of RFA. There is no work proposed within the RFA.

2.3.1 Inland Bank

Inland Bank is the resource area which confines waterways and water bodies (i.e., streams, ponds, and lakes). For streams, it extends from Mean Annual Low Water (MALW) to Mean Annual High Water (MAHW). As set forth in 310 CMR 10.54(2)(a-c), Inland Bank is defined as “the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a bordering vegetated wetland and adjacent floodplain, or, in the absence of these, it occurs between a water body and an upland.”

Bank, at the parcel, is associated with Sawins Pond. The Bank is located down gradient from the proposed project area. Vegetation in the form of mature trees and woody vines are located on the slope between the bank and the Project area. The Bank and the slope to the bank will not be altered during construction of the parking area.

2.3.2 Bordering Vegetated Wetland

As set forth in 310 CMR 10.55(2)(a-c), a BVW is defined as areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants and the BVW boundary is determined as “the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist.”

In the approved ORAD (DEP#321-0168), there are two BVW’s located on the southern bank of Sawins Pond. The BVW’s consist primarily of silver maple (*Acer saccharinum*), common cattail (*Typha latifolia*), common rush (*Juncus effusus*), jewelweed (*Impatiens capensis*), Japanese knotweed (*Fallopia japonica*), and Asiatic bittersweet (*Celastrus orbiculatus*). No work is proposed within or near the BVW.

2.3.3 Buffer Zone

The WPA establishes a 100-foot Buffer Zone associated with Inland Bank and BVW. Watertown establishes a 150-foot Buffer Zone to resource areas. The 100-foot Buffer Zone and locally regulated 150-foot Buffer Zone begin at the bank with a steep upgradient slope vegetated with trees and woody vines before transitioning into a flat area dominated by herbaceous vegetation and saplings of staghorn sumac. An existing compact soil access road spans the buffer zone between the existing parking area off Arlington Street across the northern portion of the property to Coolidge Avenue. Both Buffer Zones extends beyond the parcel boundary where they consist of paved surfaces and commercial development.

City of Watertown also regulated the first 50-feet of any bank, wetland, pond as a 50-foot No Build Zone, in which no person shall build or enlarge any structures, parking lot or impervious surface. The first 50-feet of the Buffer Zone include a steep vegetated slope leading from the bank to a relatively level upland area that consists of patches of herbaceous vegetation, compacted soils, and saplings. A portion of the Project area, including mitigation plantings, is proposed within the 50-foot No Build Zone.

2.3.4 Land Under Water

As set forth in 310 CMR 10.56(2), Land Under Water (LUW) is defined as land beneath any creek, river, stream, pond or lake and is composed of organic muck or peat, fine sediments, rocks, or bedrock and with a boundary being the mean annual low water level. LUW does not have a buffer zone. The ORAD depicts LUW stretching along the either side of the banks of Sawins Pond between the culvert at Arlington Street to the dam at Coolidge Avenue. No work is proposed within LUW.

2.3.5 Riverfront Area

Williams Brook flows from the parcel located West of Arlington Street and into Sawins Pond. According to the ORDA (DEP#321-0168), the Brook ends at Flag LB-10 on the northern side of Sawins Pond and RB-7 on the southern side of Sawins Pond. The perineal brook has a 200-foot RFA that will extend from flag LB-10 and RB-7 west to Arlington Street. The proposed Project is not located within the 200-foot RFA.

2.4 Other Environmental Constraints

SWCA evaluated whether any additional resource areas were located within the project area, such as Riverfront Area, Areas of Critical Environmental Concern (ACECs) (MassGIS 2009), Outstanding Resource Waters (ORWs) (MassGIS 2010), Natural Heritage & Endangered Species Program (NHESP) designated Priority Habitat of Rare Species and Estimated Habitat of Rare Wildlife (MassGIS 2021a and 2021b), Certified Vernal Pools (MassGIS 2021c), Potential Vernal Pools (MassGIS 2021d), 100-year Federal Emergency Management Agency (FEMA) Floodplain (FEMA 2010), or Department of Fisheries & Wildlife Cold Water Fisheries Resource Areas. No other mapped sensitive resources were identified within the Assessment Area.

3 PROPOSED WORK

3.1 Project Description

The purpose of the proposed work is to develop additional parking area for the surrounding commercial buildings while keeping disturbance to a minimum. The proposed Project consists of converting approximately 41,289 sf of the north side of the parcel into a parking area. The proposed area will be graded and topped with porous asphalt. Approximately 8,788 sf of landscaping is proposed around the parking area, specifically as landscaping islands within the parking area and along the northern edge of property. The landscaped areas will consist of plantings and New England Conservation/Wildlife seed mix in the understory. The southern edge of the parking area will consist of approximately 3-foot wide strip of rock rip rap. Approximately 15,337 sf of the area between the rip rap and the edge of slope will be planted with native trees and shrubs and contain an understory of New England Conservation seed mix/ Wildlife seed mix. The proposed mitigation plantings between the rip rap and the edge of slope will increase important wildlife habitat features by creating foraging, sheltering, and nesting opportunities where there previously few or none. Please refer to Sheet 4 of the Site Design Plan for planting list in Appendix C.

3.2 Project Impacts

No work is proposed within the jurisdictional wetlands or banks; however, portions of the 100-foot Buffer Zone to BVW and Inland Bank and locally regulated 150-foot Buffer Zone will be affected as a result of the work. In addition, Watertown regulates the first 50-feet of any bank, wetland, pond as a 50-foot No Build Zone, in which no person shall build or enlarge any structures, parking lot or impervious surface.

A small portion parking area will be located within the locally regulated 50-foot No Build Zone. However, the proposed parking area will consist of pervious material which will allow for water to recharge into the ground. The applicant is also proposing mitigation plantings, in the form of native trees, shrubs, and native herbaceous vegetation between the edge of slope and parking area, which presently

consists of mostly mugwort and compacted soil. The proposed plantings are discussed in Section 3.3 and are listed on Sheet 4 of the Site Design Plan in Appendix C. In addition, the proposed work provides an opportunity for the applicant to partially clean up the site by removing debris imbedded in the soil by the past parcel owners. The proposed work will also use best available measures, discussed in Section 3.4 to minimize adverse effects on nearby resource areas. The proposed work will result in a net ecological improvement over existing conditions and promotes the interests protected in the Watertown Wetland Ordinance.

3.3 Mitigation Measures

This parcel has been historically disturbed, specifically the area surrounding Sawins Pond. As part of the parking area construction, approximately 15,337 sf of native plantings are proposed within the 50-foot Buffer Zone in addition to the 8,788 sf landscape plantings proposed at the site. The plantings will be located between the riprap strip on the southern end of the parking area and the top of steep slope leading towards the northern bank of Sawins Pond. The proposed plantings will occur primarily within the 50-foot buffer zone to bank and will consist of a combination of trees and shrubs with a New England Conservation/ Wildlife Seed Mix in the understory. Please refer to Sheet 4 of the Design Plan in Appendix C for planting details. The proposed shrubs and trees will supplement the site's capacity to provide important wildlife habitat functions (i.e., shelter, forage, breeding areas, etc.) in addition to providing a vegetated buffer to help reduce stormwater flow and protect Sawins Pond.

3.4 Erosion and Sediment Control

To ensure no adverse impact will occur to the bank or LUW associated to Sawin's Pond, erosion and sediment controls will be placed between the proposed mitigation area and the slope leading down to the northern bank of Sawins Pond. The controls will be in the form of silt fence with staked hay bales in front of the silt fence. The installed controls will also act as a marker for limit of work. All erosion control barriers will be installed prior to any site work and shall remain in place until all surfaces are stable and any disturbed soils are sufficiently vegetated. On-site controls will be inspected daily, and any necessary maintenance will be promptly completed per the manufacturer's specifications and repaired as needed. Additional controls will be installed if site conditions warrant them as determined by the contractor. Exposed soils will not be left un-stabilized for more than 7 consecutive days without proper stabilization. The Design Plan depicts the location of the controls in Appendix C. Construction debris and sediment will be kept on-site and will not be permitted to migrate beyond the project boundaries. All temporary disturbed surfaces will be restored to preexisting conditions to the greatest extent possible.

4 REGULATORY COMPLIANCE

4.1 Massachusetts Wetlands Protection Act

The proposed activities are located within 100-foot Buffer Zone to Inland Bank and BVW only. The proposed work meets the requirements of General Provisions of work within the Buffer Zone of inland resource areas (310 CMR 10.53) the WPA.

4.2 Watertown Bylaws Performance Standards

The proposed activities are located within locally regulated 150-foot Buffer Zone to Inland Bank. Table 1 below lists the performance standards for the 150-foot Buffer Zone as set forth in the Watertown Wetlands Ordinance Rules and Regulations (Section IV(H)).

In addition, Watertown regulated the 50-foot No Build Zone as specified in Section IV A(9) of the Watertown Wetlands Ordinance Rules and Regulations. Though a small portion parking area will be located within the No Build Zone, the parking area will consist of pervious material, allowing for water to recharge into the ground. In addition, approximately 15,337 sf square feet of native vegetation is proposed to be installed. The proposed plantings will supplement the site's capacity to provide important wildlife habitat functions and enhance the Buffer Zone with diverse native vegetation. Also, the proposed work provides an opportunity for the applicant to partially clean up the site by removing debris imbedded in the soil by the past owners. During construction best available measures will be implemented to minimize adverse effects on nearby resource areas.

The Applicant requests approval to complete the proposed re-development work in the buffer zone and requests a waiver to the 50-foot No Build Zone as the proposed work will result in a net ecological improvement over existing site conditions and promotes the interests protected in the Watertown Wetland Ordinance.

Table 1. General Performance Standards for Buffer Zone (Section IV (H))

Citation	Regulation	Compliance
Section IV H(4)(a)	No work in a Buffer Zone should alter an adjacent Resource Area (including Intermittent Streams or Springs), or if an adjacent Resource Area is altered by work in the Buffer Zone, the alteration must comply with the applicable performance standards for the altered Resource Area and any other conditions the Commission may require to enforce those performance requirements.	Proposed work will include the installation of erosion and sediment controls, prior to the start of work. The controls will reduce the risk of sediment reaching the down gradient resource areas and will act as a limit of work.
Section IV H(4)(b)	The Commission may consider the extent of work, the proximity of the work to the Resource Area, the presence of steep slopes, the extent to which the Buffer Zone has already been developed, the extent of natural vegetation, and other factors that affect the potential impact of work in the Buffer Zone on Resource Areas. Where prior development of the Buffer Zone is extensive, the Commission may require measures such as the restoration of natural vegetation adjacent to the Resource Area to protect the interests of the Ordinance.	As part of the work, the buffer between the proposed pervious parking area and the resource area will be enhanced with native tree and shrub vegetation.
Section IV H(4)(c)	No above ground or underground storage tanks containing hazardous materials or gasoline, oil or other fuels may be placed within 100 feet of an adjacent protected Resource Area (including Intermittent Streams and Springs.)	Not applicable. No storage tanks are proposed.

Citation	Regulation	Compliance
Section IV H(4)(d)	The following activities will be prohibited within 25 feet of an adjacent Resource Area (including Intermittent Streams and Springs): ☐ Removal of trees or surface vegetation, except for selective pruning or thinning, removal of hazardous trees, replacement of non-native or invasive species with native plantings, or replacement of lawn or other significantly artificial landscape with indigenous groundcover, trees and/or shrubs. ☐ Use of fertilizers or pesticides. ☐ Dumping of grass clippings, brush, leaves, or other debris or trash. ☐ Storage of scrap metal, construction materials or equipment, or other materials. ☐ Piling of road salt, sand or snow. ☐ Vehicle parking.	No work is proposed within 25 feet of the resource area.
Section IV H(4)(e)	The Commission will not approve any alteration within 50 feet of a vernal pool, except under the provisions of Section I.D(2) or Section IV.A(9) of these Regulations. Such a waiver will at a minimum impose the same conditions and performance standards identified above for areas within 25 feet of protected Resource Areas.	Not applicable; there are no vernal pools in the area.
Section IV H(4)(f)	Properties not currently in compliance with the performance standards for Buffer Zones will not be permitted to increase their degree of non-conformance.	Not applicable.
Section IV H(4)(g)	The Commission may, at its sole discretion, require greater than the minimum setback distances specified above.	-
Section IV H(4)(h)	Erosion and sedimentation controls must be utilized for any construction within the Buffer Zone that will result in exposed soils. No silt or sediment may be allowed to enter a Resource Area during or subsequent to construction.	Erosion and sediment controls will be installed prior to commencement of work and will remain in place until all disturbed areas are stabilized. Erosion and sediment control locations are depicted on plans between the work area and the resource area.
Section IV H(4)(i)	Limited projects in the Buffer Zone....	Not applicable, this is not a limited project.

5 CONCLUSION

The work proposed in this NOI is designed to re-develop the site by expanding the existing parking area east towards Coolidge Avenue at 0 Arlington Street in Watertown. The proposed work includes the construction of a pervious parking area along the previously disturbed northern side of the parcel between the existing parking lot and Coolidge Avenue. The work will occur within the 100-foot Buffer Zone and locally regulated 150-foot Buffer Zone to Inland Bank of Sawins Pond only. Though a portion of the proposed parking area will be within the locally regulated 50-foot No Build Zone, the proposed work will result in a net ecological enhancement over existing site conditions and promotes the interests protected in the Watertown Wetland Ordinance. This work is filed under 310 CMR 10.53(1) and meets the provisions under that section of the WPA as well as the Watertown Wetlands Ordinance. Therefore, we respectfully request the Watertown Conservation Commission to issue an Order of Conditions in support of this Project.

6 REFERENCES

Federal Emergency Management Agency (FEMA). 2010. Flood Insurance Rate Map (FIRM), Middlesex County, Massachusetts, Map No. 25017C0557E.

Massachusetts Geographic Information System (MassGIS). 2009. Areas of Critical Environmental Concern. Available at <https://docs.digital.mass.gov/dataset/massgis-data-areas-critical-environmental-concern>. Accessed November 2022.

MassGIS. 2021a. NHESP Priority Habitats of Rare Wildlife. Available online at <https://docs.digital.mass.gov/dataset/massgis-data-nhesp-priority-habitats-rare-species>. Accessed November 2022.

MassGIS. 2021b. NHESP Estimated Habitats of Rare Wildlife. Available online at <https://docs.digital.mass.gov/dataset/massgis-data-nhesp-estimated-habitats-rare-wildlife>. Accessed November 2022.

MassGIS. 2021c. NHESP Certified Vernal Pools. Available online at <https://www.mass.gov/info-details/massgis-data-nhesp-certified-vernal-pools> . Accessed November 2022.

MassGIS 2021d. NHESP Potential Vernal Pools. Available online at <https://www.mass.gov/info-details/massgis-data-nhesp-potential-vernal-pools> . Accessed November 2022.

MassGIS. 2010. Outstanding Resource Waters. Available at: <https://www.mass.gov/info-details/massgis-data-outstanding-resource-waters>. Accessed November 2022.

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APPENDIX A

Watertown NOI Checklist

Watertown NOI Application for Permit

Watertown NOI Fee Calculation and Transmittal Form



Town of Watertown
Administration Building
149 Main Street
Watertown, Massachusetts 02472
Conservation Commission
Tel: (617) 972-6426 • Fax: (617) 972-6484

Laurel Schwab, Conservation Agent lschwab@watertown-ma.gov
Susan Jenness, Clerk sjenness@watertown-ma.gov

**CHECKLIST FOR FILING A NOTICE OF INTENT (NOI)
OR A REQUEST FOR DETERMINATION OF APPLICABILITY (RDA) OR OTHER
WETLANDS PERMIT**

Prior to submitting the NOI or Other Wetlands Permit:

- ☒ Let the Conservation Commission office know of your intention to file a NOI or RDA or Other Wetlands permit. You may contact us at (617)972-6426 or through e-mail Susan Jenness, Conservation Clerk, sjenness@watertown-ma.gov.
- ☒ Complete the NOI Form or Other Wetlands Forms including all supplemental information.
Note: A complete NOI or Other Wetland Permit includes Fee Transmittal Form, Filing Fee Calculation Worksheet, as well as all other relevant material.
or
- ☐ Complete the RDA Form including relevant supporting data and plans
- ☒ Prepare plans showing proposed work, existing structures, proposed and existing grades, resources areas and buffer zones. The plans must be signed, stamped and dated.

Submittal Procedures:

DEP:

- ☒ Send the Commonwealth's fee by certified mail to:

Massachusetts DEP
P.O. Box 4062
Boston, MA 02111

- ☒ Digitally upload the complete package to the eDEP portal **OR** send a copy of the NOI or Other Wetlands Permit or RDA with all plans by certified mail to:
MassDEP Northeast Regional Office
205B Lowell St
Wilmington, MA 01887

TOWN ENGINEER:

- ☒ Send 1 copy of the NOI or Other Wetlands Permit or RDA with all plans and supplemental information by certified mail or hand deliver with receipt to:

Town Engineer
Dept. of Public Works
124 Orchard Street
Watertown, MA 02472

CONSERVATION COMMISSION:

- ☒ Submit the following by certified mail or hand deliver with receipt to:

Conservation Commission
Administration Building, 3RD floor
149 Main Street
Watertown, MA 02472

1. A brief project introduction and summary outlining project proposal
2. The **original and 6 copies** collated of *Application for Permit/Determination Watertown Wetlands Ordinance* form and NOI or RDA.
3. **6 complete sets of plans (signed, stamped and dated)**
4. The Town's share of application fee under the Wetlands Protection Act. (*Make check payable to the **Watertown Conservation Commission**.*)
5. The fee under the Watertown Wetlands Ordinance along with the completed *Fee Calculation and Transmittal Form*. (*Make check payable to **Town of Watertown**.*)
6. A copy of the check to the Commonwealth
***Note:** Submit the state share of the filing fee to the DEP as indicated on the Notice of Intent Fee Transmittal Form.*
7. Evidence of submittal to DEP and Town Engineer must be submitted to the Conservation Commission prior to the public hearing.

Upon filing on or before the "Filing Deadline," the applicant will be responsible for notifying the abutters and appropriate Town Departments. Our office can generate an abutters list for you. The Town will place the public notice, at your expense, in the *Watertown TAB & Press*. If you have any questions or need assistance, feel free to contact our office.



Town of Watertown
Administration Building
149 Main Street
Watertown, Massachusetts 02472
Conservation Commission
Tel: (617) 972-6426 • Fax: (617) 972-6484

WATERTOWN WETLANDS ORDINANCE

Application for Permit/Determination

Application for:

- ☐ Request for Determination of Applicability ☒ Notice of Intent
☐ Other

Owner*		Applicant	
Name	Maximos Hatziliades	Name	Maximos Hatziliades
Street	5 Madison Street	Street	5 Madison Street
City	Belmont	City	Belmont
State	MA	State	MA
Zip	02478	Zip	02478
Phone	617-331-8209	Phone	617-331-8209
e-mail	maxhatz2@gmail.com	e-mail	maxhatz2@gmail.com

**Name(s) and address(s) under which title of property is recorded at Registry of Deeds.*

1. Location of site where work is proposed: _____
0 Arlington Street, Watertown- between 71 Arlington ST. and 15 Arlington ST.

Town of Watertown Assessor's Information:

Map: 1510 Lot: 1 Block: 0

2. Briefly describe the proposed work:

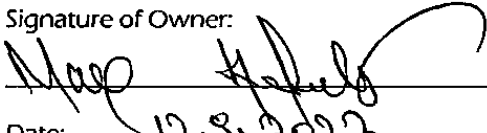
Construction of a pervious parking area along the northern portion of the
property, extending from the existing paved parking area off Arlington St
east towards Coolidge Ave.

3. Are there any impediments to accessing the site? ☒ No ☐ Yes

If yes, what are they (fence, dog, topography, etc.): Enter from Arlington Street, there is a fence from Coolidge Avenue side.

By signing this application the owner grants permission to the Conservation Commission for its members and designated representative to enter upon the premises of the site.

Signature of Owner:

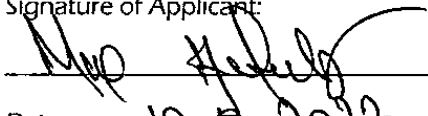


Date: 12.9.2022

Waiver

If the next regular meeting of the Conservation Commission is not within 21 days of submission of this filing, or if the agenda for the next regular meeting is full, I waive the 21 day requirement and agree to a later date for this Hearing no later than the next regular scheduled meeting or 30 days from the date of the filing a complete application (whichever is less).

Signature of Applicant:



Date: 12.9.2022



Town of Watertown
 Administration Building
 149 Main Street
 Watertown, Massachusetts 02472
Conservation Commission
 Tel: (617) 972-6426 • Fax: (617) 972-6484

WATERTOWN WETLANDS ORDINANCE Fee Calculation and Transmittal Form

Owner		Applicant	
Name	Maximos Hatziliades	Name	Maximos Hatziliades
Street	5 Madison Street	Street	5 Madison Street
City	Belmont	City	Belmont
State	MA	State	MA
Zip	02478	Zip	02478
Phone	617-331-8209	Phone	617-331-8209
e-mail	maxhatz2@gmail.com	e-mail	maxhatz2@gmail.com

Project Location:

0 Arlington Street, Watertown- between 71 Arlington ST. and 15 Arlington ST.

Any person filing an Application for Permit/RDA/NOI pursuant to the Ordinance shall, at the same time, pay a filing fee in accordance with the Filing Fee Schedule contained in the *Rules and Regulations for the Administration of the Watertown Wetlands Ordinance of 2008*. Municipal agencies are exempt from this requirement.

A. Fee Schedule:

Project Size	Fees
Less than 1,000 sq. ft.	\$50.00
1,000 sq. ft. to less than 2,000 sq. ft.	\$100.00
2,000 sq. ft. to less than 3,000 sq. ft.	\$150.00
3,000 sq. ft. to less than 4,000 sq. ft.	\$200.00
4,000 sq. ft. to less than 5,000 sq. ft.	\$250.00
5,000 sq. ft. to less than 6,000 sq. ft.	\$300.00
6,000 sq. ft. to less than 10,000 sq. ft.	\$400.00
10,000 sq. ft. to less than 15,000 sq. ft.	\$500.00
15,000 sq. ft. to less than 20,000 sq. ft.	\$650.00
20,000 sq. ft. to less than 30,000 sq. ft.	\$750.00
30,000 sq. ft. to less than 50,000 sq. ft.	\$850.00
50,000 sq. ft. or greater	\$1000.00

Project Fee

\$1000.00

If yes, what arrangements have been or will be made to ensure that the Conservation Commission members and designated representatives have safe and easy access to the site?

6. Do you understand that notification of this application and the Public Hearing will be published in a newspaper of local circulation at your expense? Please check-off appropriate box: ☒ Yes ☐ No

7. How much is the filing fee, for this project, under the local ordinance? And under the Wetlands Protection Act?

\$ 1000.00

(See Fee Schedule). Make check payable to the Town of Watertown.

\$ 262.50

(See NOI Wetland Fee Transmittal Form wpaform3.doc) Make check payable to the Watertown Conservation Commission)

I hereby certify, under the pains and penalties of perjury, that the contents of this application are true and complete.

Signature of Applicant:

_____

Date: 12-2022

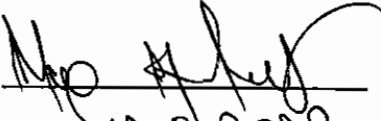
Fee Exemption

The Commission may waive the filing fee for an Application or Request for Determination filed by a government agency, for an RDA filed by a person having no financial connection with the subject property, for any projects whose sole effect is to substantially enhance a Resource Area, or for other reasonable grounds as determined by the Commission at its discretion.

Grounds for Exemption (to be filled out by CC staff)

Signature of Owner or Applicant: _____

Date: _____


12.9.2022

Enclose this form with a check or money order for the calculated amount payable to the Town of Watertown with the Application for Permit or Request for Determination of Applicability. These fees are non-refundable.

Please note this payment does not relieve the Applicant from the further fee requirements as stated in the Wetlands Protection Act Regulations MGL Chapter 44, Section 53G.

APPENDIX B

WPA Form 3

Copies of Checks



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

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):

0 Arlington Street

a. Street Address

Watertown

b. City/Town

MA

c. Zip Code

Latitude and Longitude:

1510

f. Assessors Map/Plat Number

42.364755

d. Latitude

-71.152585

e. Longitude

1-0

g. Parcel /Lot Number

2. Applicant:

Maximos

a. First Name

Hatziliades

b. Last Name

c. Organization

5 Madison Street

d. Street Address

Belmont

e. City/Town

MA

f. State

02478

g. Zip Code

617-331-8209

h. Phone Number

i. Fax Number

maxhatz2@gmail.com

j. Email Address

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

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

Polina

a. First Name

Safran

b. Last Name

SWCA Environmental Consultants

c. Company

153 Cordaville Road, Suite 130

d. Street Address

Southborough

e. City/Town

MA

f. State

01772

g. Zip Code

413-256-0202

h. Phone Number

i. Fax Number

polina.safran@swca.com

j. Email address

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

\$500

a. Total Fee Paid

\$237.50

b. State Fee Paid

\$262.50

c. City/Town Fee Paid



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

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A. General Information (continued)

6. General Project Description:

Construction of a pervious parking area along the northern portion of the property, extending from the existing paved parking area off Arlington St east towards Coolidge Ave.

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 CMR 10.24(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:

Middlesex County

a. County

1313

c. Book

b. Certificate # (if registered land)

36

d. Page Number

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

- ☒ 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.
- ☒ 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	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. ☐ Riverfront Area	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:

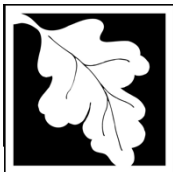
a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

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.



Massachusetts Department of Environmental Protection
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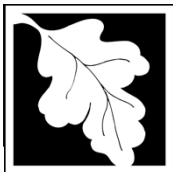
City/Town

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

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

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

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
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
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet	
	2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	
4. ☐ Restoration/Enhancement		
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.		
a. square feet of BVW	b. square feet of Salt Marsh	
5. ☐ Project Involves Stream Crossings		
a. number of new stream crossings	b. number of replacement stream crossings	



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

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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

2022

b. Date of map

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

- c. Submit Supplemental Information for Endangered Species Review*

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

(a) within wetland Resource Area

percentage/acreage

(b) outside Resource Area

percentage/acreage

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

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

- (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)
- (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review>).

Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

- (c) ☐ MESA filing fee (fee information available at <https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review>).

Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

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

- (d) ☐ Vegetation cover type map of site

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

- (f) OR Check One of the Following

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

2. ☐ Separate MESA review ongoing.

a. NHESP Tracking #

b. Date submitted to NHESP

3. ☐ Separate MESA review completed.

Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

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

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

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

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

North Shore - Hull to New Hampshire border:

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

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

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

- c. ☐ Is this an aquaculture project?

- d. ☐ Yes ☐ No

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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

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

Online Users:

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

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
a. ☐ Yes ☐ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
- b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
a. ☐ Yes ☒ No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
a. ☐ Yes ☒ No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
2. ☒ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System.
b. ☐ No. Check why the project is exempt:
1. ☐ Single-family house
2. ☐ Emergency road repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

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

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

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

1. ☐ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☐ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Watertown

City/Town

D. Additional Information (cont'd)

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

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

Proposed Site Plan

a. Plan Title

Engineering Alliance, Inc.

Richard Salvo

b. Prepared By

c. Signed and Stamped by

August 5, 2022

as-needed

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☒ Attach NOI Wetland Fee Transmittal Form
9. ☐ Attach Stormwater Report, if needed.

E. Fees

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

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

3935

2. Municipal Check Number

3934

4. State Check Number

Max

6. Payor name on check: First Name

December 9, 2022

3. Check date

December 9, 2022

5. Check date

Hatziliades

7. Payor name on check: Last Name



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:
MassDEP File Number
Document Transmittal Number
Watertown
City/Town

F. Signatures and Submittal Requirements

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

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

1. Signature of Applicant

[Handwritten Signature]

2. Date

12/9/2022

3. Signature of Property Owner (if different)

Polina Safran

4. Date

12/9/2022

5. Signature of Representative (if any)

6. Date

For Conservation Commission:

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

For MassDEP:

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

Other:

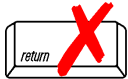
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

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



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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



A. Applicant Information

1. Location of Project:

0 Arlington Street

a. Street Address

3934

c. Check number

Watertown

b. City/Town

\$237.50

d. Fee amount

2. Applicant Mailing Address:

Maximos

a. First Name

Hatziiliades

b. Last Name

c. Organization

5 Madison Street

d. Mailing Address

Belmont

e. City/Town

MA

f. State

02478

g. Zip Code

617-331-8209

h. Phone Number

i. Fax Number

maxhatz2@gmail.com

j. Email Address

3. Property Owner (if different):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

B. Fees

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.

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



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 2b	1	\$500	\$500
Step 5/Total Project Fee:			\$500

Step 6/Fee Payments:

Total Project Fee:	<u>\$500</u>
	a. Total Fee from Step 5
State share of filing Fee:	<u>\$237.50</u>
	b. 1/2 Total Fee less \$12.50
City/Town share of filling Fee:	<u>\$262.50</u>
	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.)

71 ARLINGTON STREET REALTY TRUST
5 MADISON STREET
BELMONT MA 02478

3934
53-7017-2113

12.9.2022
Date

CHECK ARMOR
FRAUD PROTECTION

Pay to the
Order of

CONNORWELLY OF MA
two hundred thirty seven

\$ 237.50
Dollars
Photo
Safe
Deposit®
Details on back

Watertown
— Savings Bank —

For

[Signature]

⑆ 211370176⑆ 068 100467 4 3934

71 ARLINGTON STREET REALTY TRUST
5 MADISON STREET
BELMONT MA 02478

3935
53-7017-2113

12.9.2022
Date

CHECK ARMOR
FRAUD PROTECTION

Pay to the
Order of

Town of Watertown
two hundred sixty two

\$ 262.50
Dollars
Photo
Safe
Deposit®
Details on back

Watertown
— Savings Bank —

For

[Signature]

⑆ 211370176⑆ 068 100467 4 3935

MAXIMOS HATZILIADIS
5 MADISON ST
BELMONT MA 02478

572
53-7017-2113

12.12.2022
Date

CHECK ARMOR
FRAUD PROTECTION

Pay to the
Order of

Town of Watertown
one thousand

\$ 1,000.00
Dollars
Photo
Safe
Deposit®
Details on back

Watertown
— Savings Bank —

For Conservation No 1

[Signature]

⑆ 211370176⑆ 067 106370 7 0572

APPENDIX C

USGS Site Locus

FEMA Mapping

Site Design Plan

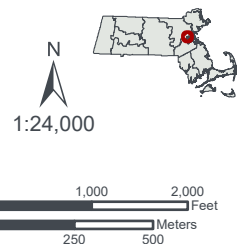


PARKING LOT NOI SAWINS POND
Figure 1. Site Locus
USGS
Topographic Map

- ▭ Subject Property
- USGS Quadrangle Boundary

Watertown
 Middlesex County, MA
 USGS 7.5' Quadrangle:
 Newton, MA, 42071-C2
 NAD 1983 StatePlane
 Massachusetts Mainland
 FIPS 2001
 71.1528°W 42.3643°N

Base Map: ESRI ArcGIS Online,
 accessed December 2022
 Updated: 12/1/2022
 Project No. 66582
 File: 01_SiteLocus



National Flood Hazard Layer FIRMMette



71°9'25"W 42°22'6"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000 71°8'48"W 42°21'39"N
Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

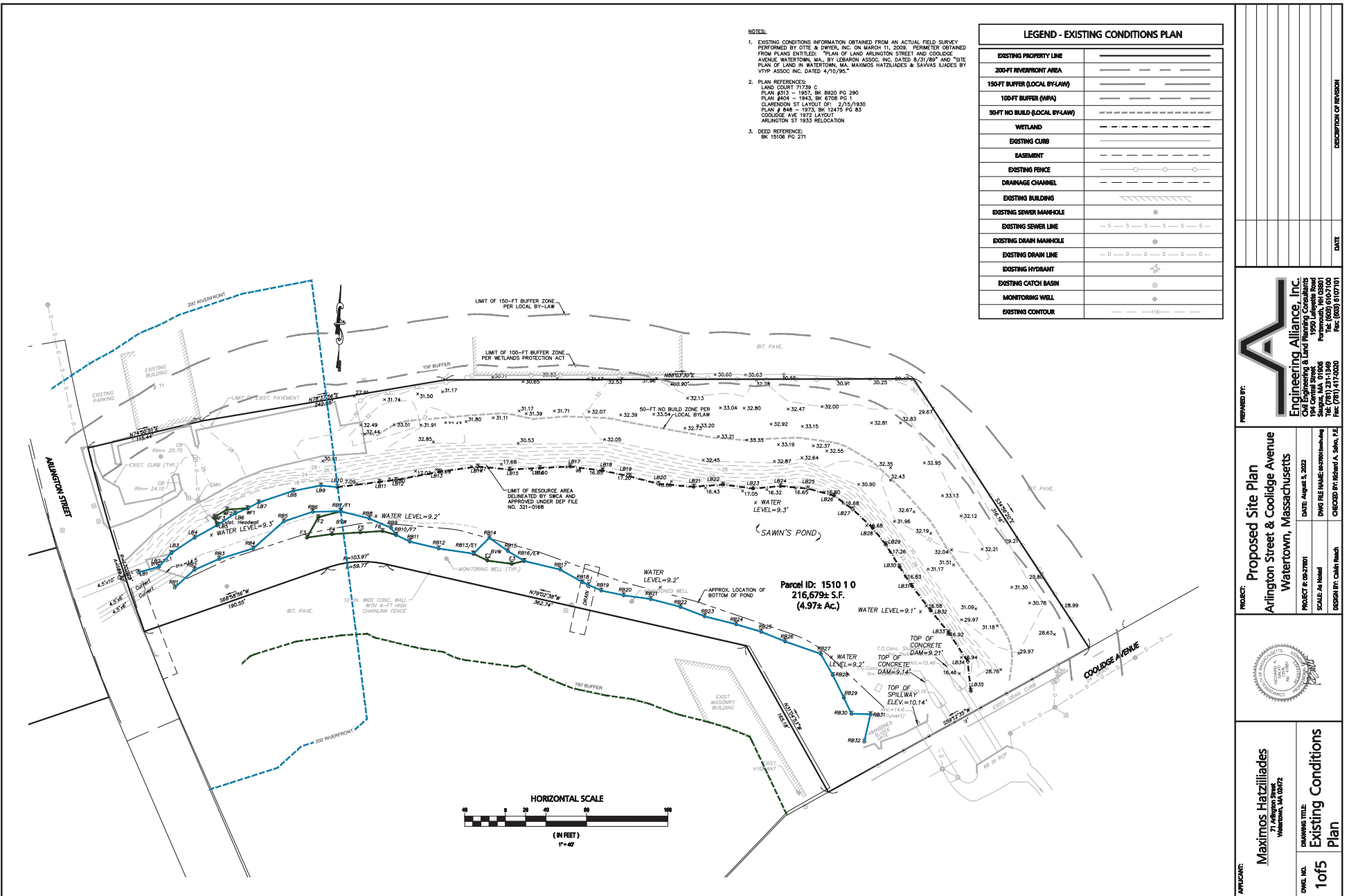


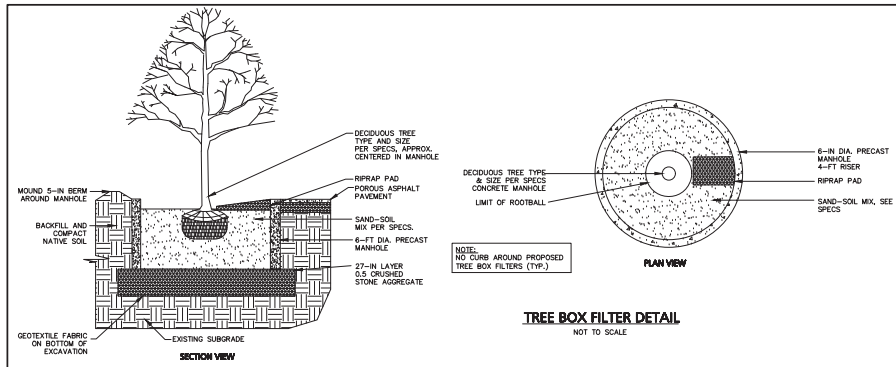
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/18/2022 at 5:05 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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





PROJECT NOTES:

- THIS PLAN HAS BEEN PREPARED TO MEET THE CONTENT REQUIREMENTS OF THE TOWN OF WATERTOWN ZONING ORDINANCE (AMENDED TO JULY 8, 2008) AND THE WETLANDS ORDINANCE (REVISED THROUGH 9/08).
- THIS PLAN HAS BEEN PREPARED TO ILLUSTRATE THE CONSTRUCTION OF A 43,840 S.F. POROUS ASPHALT PARKING FACILITY CONSISTING OF 136 PARKING SPACES (5 HANDICAP) IN WATERTOWN, MA.
- THE FOLLOWING INFORMATION HAS BEEN INCLUDED WITH THIS APPLICATION:
A. SITE DEVELOPMENT PLANS
B. NOTICE OF INTENT AND STORMWATER MANAGEMENT CALCULATIONS
- ZONING: I-2 INDUSTRIAL-2
- USE: PARKING AREA
- PROPERTY LOCATION: COOLIDGE AVENUE AND ARLINGTON STREET
WATERTOWN, MA 02472
(PARCEL ID: 1510 1 0)
- OWNER OF RECORD/APPLICANT: MAXIMOS HATZILIADIS
71 ARLINGTON STREET
WATERTOWN, MA 02472
- CIVIL ENGINEERING: ENGINEERING ALLIANCE, INC.
194 CENTRAL STREET
SAUGUS, MA 01906
TEL: (781) 231-1549
FAX: (781) 417-2020
- LAND SURVEYOR: OTTE AND DWYER, INC.
59 APPLETON STREET
SAUGUS, MA 01906
TEL: (781) 233-8155
FAX: (781) 520-9701
- THE PROJECT SITE IS LOCATED WITHIN ZONE "C" (NOT IN FLOOD), ACCORDING TO FLOOD INSURANCE RATE MAP FOR THE TOWN OF WATERTOWN, MA, MIDDLESEX COUNTY COMMUNITY PANEL NUMBER 050223 0002 B, DATED SEPTEMBER 30, 1980.
- CONTRACTOR IS DIRECTED TO THE TOWN OF WATERTOWN RULES AND REGULATIONS FOR CONSTRUCTION REQUIREMENTS AND INSPECTION OBLIGATIONS.
- THE CONTRACTOR SHALL GIVE TWENTY-FOUR (24) HOURS NOTICE TO PERTINENT TOWN DEPARTMENTS BEFORE COMMENCING ANY WORK IN THE FIELD.

NOTE:
TOTAL PAVEMENT AREA = 41,289 S.F. (136 SPACES)

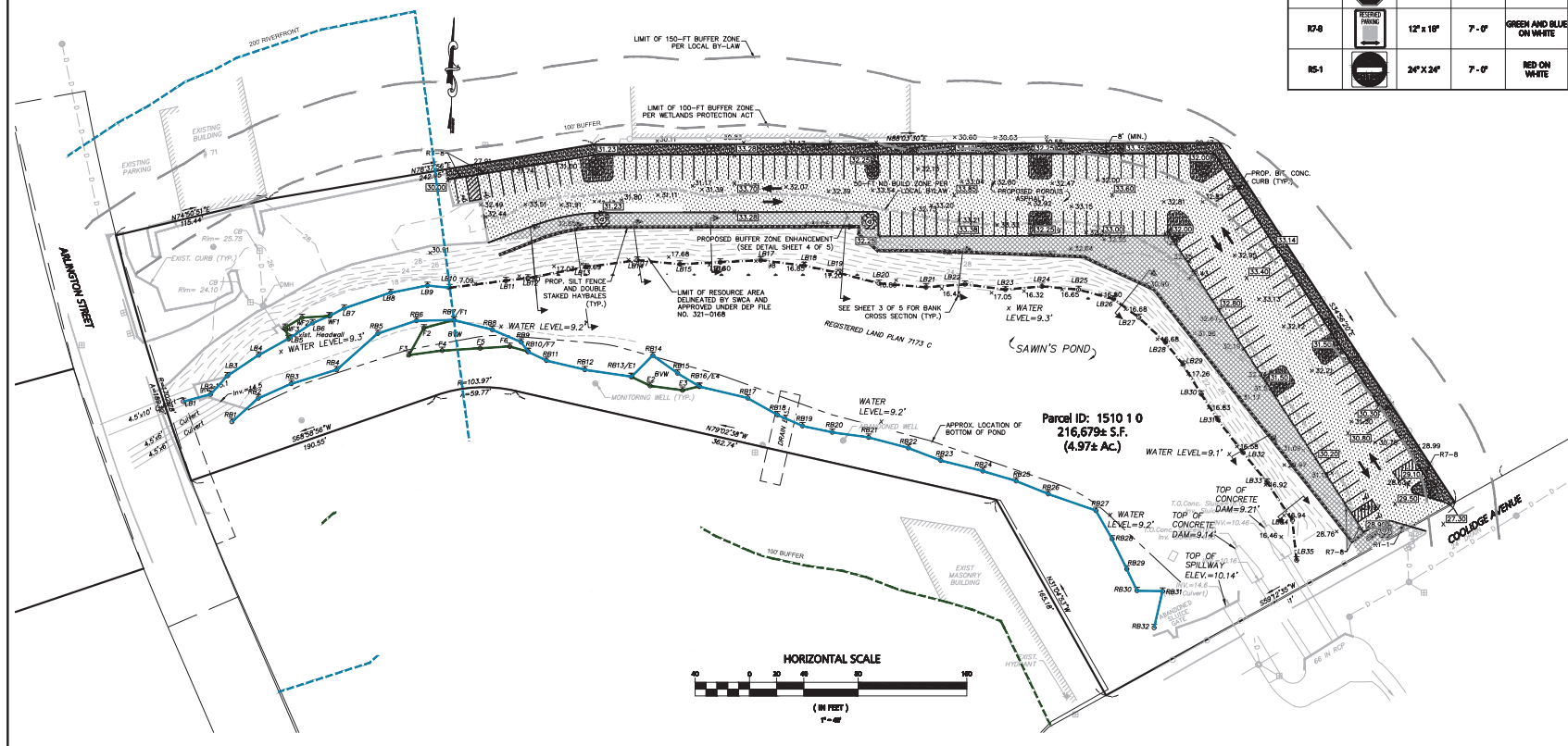
LEGEND - LAYOUT & GRADING PLAN

PROPERTY LINE	
PROPOSED STRIPING	
PARKING COUNT	136
SIGN DESIGNATION	A
LANDSCAPED AREA	
HANDICAP PARKING	
PROPOSED SALT FENCE AND DOUBLE STAKED HAYBALES	

- NOTES:
- PER SECTION 6.02, ENTITLED "LOCATION AND DESIGN OF OFF-STREET PARKING SPACES," OF THE WATERTOWN ZONING ORDINANCE, AMENDED TO JULY 8, 2008, AT LEAST 5% OF THE INTERIOR OF ANY PARKING WITH 20 OR MORE PARKING SPACES SHALL BE LANDSCAPED AND CONTINUOUSLY MAINTAINED.
PROPOSED PARKING AREA: 43,840 S.F.
REQUIRED INTERIOR LANDSCAPING: 43,840 x 5% = 2,192 S.F.
PROVIDED INTERIOR LANDSCAPING: 2,270 S.F.
 - REQUIRED PARKING AREA SETBACK FROM LOT LINES: 8 FT.
PROVIDED PARKING AREA SETBACK FROM LOT LINES: 8 FT.

SIGN TABLE

REGULATORY DESCRIPTION	SKIN	SIZE	MOUNTING HEIGHT	DESCRIPTION	REFLECTORIZED
R1-1		24" x 24"	7'-0"	WHITE ON RED	YES
R7-8		12" x 18"	7'-0"	GREEN AND BLUE ON WHITE	YES
R5-1		24" x 24"	7'-0"	RED ON WHITE	YES



PREPARED BY:

Engineering Alliance, Inc.
194 Central Street
Saugus, MA 01906
Tel: (781) 231-1549
Fax: (781) 417-2020

PROJECT:

**Proposed Site Plan
Arlington Street & Coolidge Avenue
Watertown, Massachusetts**

PROJECT # 08-07801

DATE: August 5, 2002

SCALE: As Shown

DESIGN BY: Camille Beach

CHECKED BY: Richard A. Sabin, P.E.

APPLICANT:

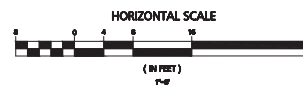
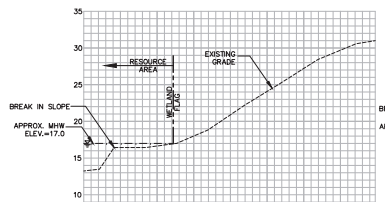
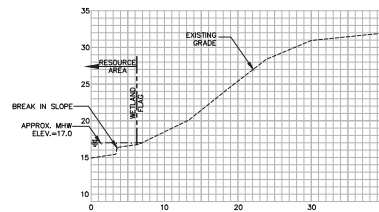
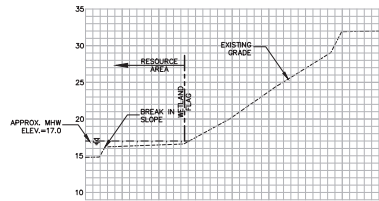
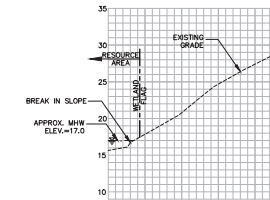
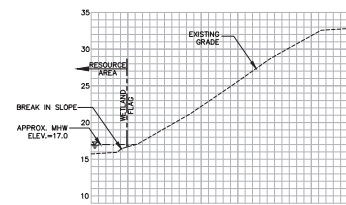
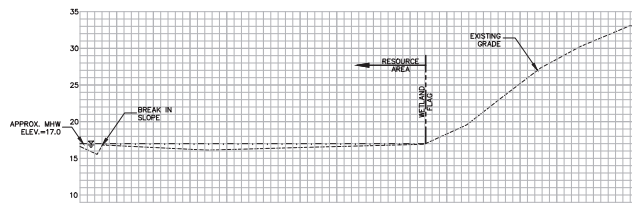
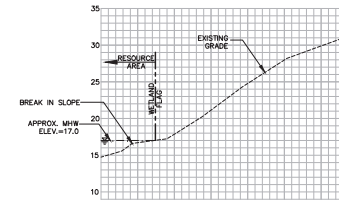
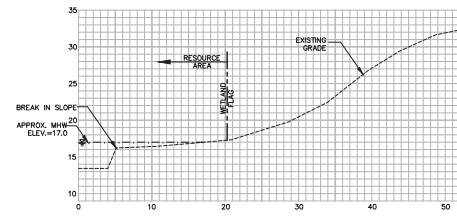
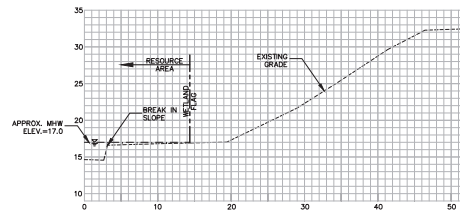
Maximos Hatziliadis
Watertown, MA 02472

DRAWING TITLE:

**Layout & Grading
2015 Plan**

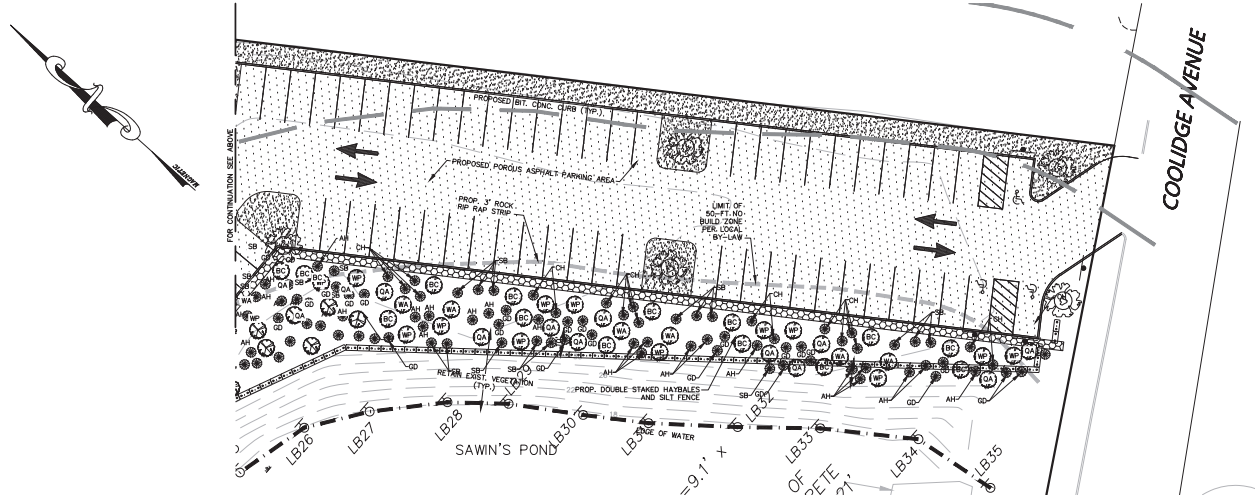
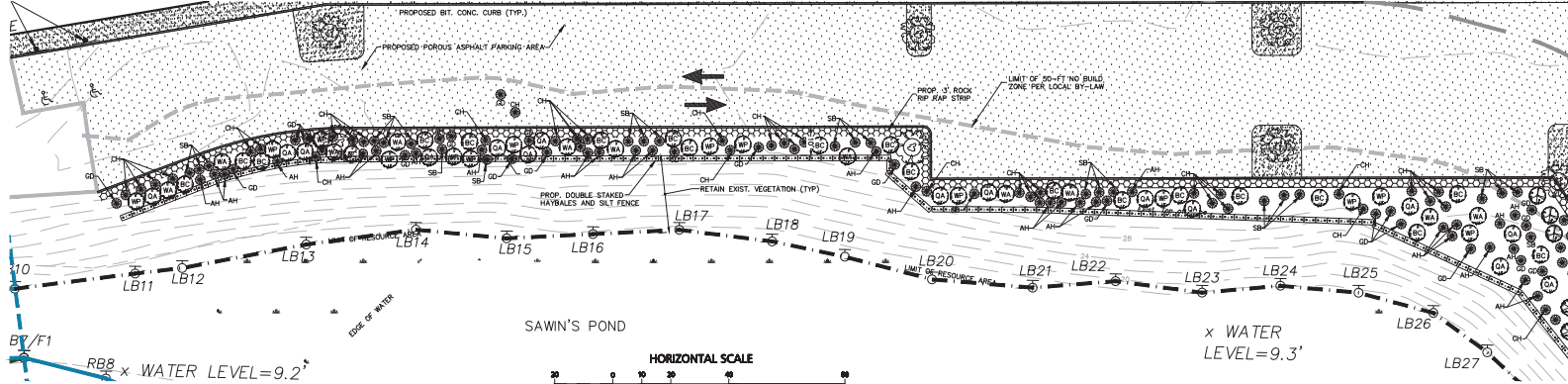
DRAWING NO.

2015



LEGEND - BANK CROSS SECTIONS	
EXISTING GRADE	-----
MEAN HIGH WATER LEVEL	----- X ----- X ----- X ----- X ----- X ----- X ----- X -----
APPROX. LIMIT OF WETLAND	-----

DWG. NO. 30f5	DRAWING TITLE Bank Cross Sections		PROJECT: Proposed Site Plan Arlington Street & Coolidge Avenue Watertown, Massachusetts	PREPARED BY:  Engineering Alliance, Inc. Civil Engineering & Land Planning Consultants 1950 Lakeside Avenue South Portland, ME 04106 Tel: (800) 616-0100 Fax: (800) 417-6200	DATE	DESCRIPTION OF REVISION



PLANTING KEY

TREE:

WP= WHITE PINE / PINUS STROBUS

QA= QUINQUE LOBED / POPULUS TREMULA

BC= BLACK CHERRY / PRUNUS SEROTINA

WA= WHITE ASH / FRAXINUS AMERICANA

SHRUB

AH= AMERICAN HAZELNUT / CORYLUS AMERICANA

SB= SHADBLOW / AMELANCHIER CANADENSIS

CH= BLACK CHOKERBERRY / ARONIA MELANOCARPA

GD= GREY DOGWOOD / CORNUS RACEMOSA

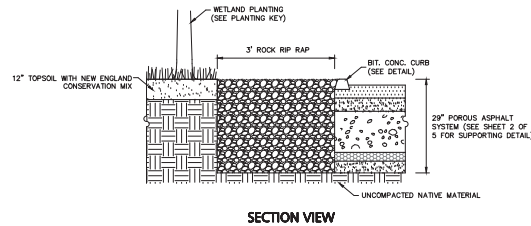
HERB

NE= NEW ENGLAND CONSERVATION / WILDLIFE SEED MIX

SUBSTITUTIONS MAY BE MADE BASED UPON NURSERY AVAILABILITY AND COST

NOTE:

BUFFERZONE ENHANCEMENT SECTION TO BE REPEATED THROUGHOUT ENTIRE BUFFERZONE ENHANCEMENT AREA.



BUFFERZONE ENHANCEMENT AREA

NOT TO SCALE

APPLICANT: Maximos Hatzililades Wetland Consultant Wetland, MA 02072	DRAWING TITLE: Buffer Zone Enhancement Plan	DWG. NO.: 40f5	PROJECT #: 08-27801	DATE: August 1, 2002	DESIGN BY: Calvin Beach	CHECKED BY: Richard A. Sabin, P.E.	DWG. FILE NAME: 08-27801.dwg	SCALE: As Shown	PROJECT NAME: Proposed Site Plan	PROJECT LOCATION: Arlington Street & Coolidge Avenue	PROJECT CITY: Watertown, Massachusetts	PROJECT STATE: MA	PROJECT COUNTY: Worcester	PROJECT ZIP: 01472	PROJECT DESCRIPTION: Proposed Site Plan	PROJECT DRAWN BY: Calvin Beach	PROJECT CHECKED BY: Richard A. Sabin, P.E.	PROJECT DATE: August 1, 2002	PROJECT SCALE: As Shown	PROJECT CITY: Watertown, Massachusetts	PROJECT STATE: MA	PROJECT COUNTY: Worcester	PROJECT ZIP: 01472	PROJECT DESCRIPTION: Proposed Site Plan	PROJECT DRAWN BY: Calvin Beach	PROJECT CHECKED BY: Richard A. Sabin, P.E.	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APPENDIX D

Site Photographs



Photo #1: View western portion of the property adjacent to the existing paved parking area. The line of trees on the right is the edge of the slope down to Sawins Pond. The proposed work is located within the 100-foot Buffer Zone and locally regulated 150-foot Buffer Zone. *Facing east.*



Photo #2: View western section of the Project area. Proposed work will occur between the edge of the line of trees (right) and the northern property boundary, located just before the building on the left. Approximately, from the visible access road to the tree line is a portion of the 50-foot no build zone, in which mitigation plantings will be installed along with a small portion of the proposed parking area. *Facing east.*



Photo #3: View the proposed Project area. Proposed work area consists of primarily herbaceous vegetation. This area is located within the 100-foot Buffer Zone and locally regulated 150-foot Buffer Zone. Sawins Pond is located south (left) of the Project area. *Facing west.*



Photo #4: View of proposed Project area. Staghorn sumac is visibly growing along the northern fence line between the property and adjacent commercial property. Small piles of debris embedded in soil and overgrown with vegetation are located along the northern edge of the property. As part of the Project, these piles of debris will be removed off site. *Facing east.*



Photo #5: View the eastern end of the property, near Coolidge Avenue. Proposed work area consists of primarily herbaceous vegetation and a row of staghorn sumacs growing along the northern (right) fence line. The 50-foot no build zone is located to the left and consists primarily of herbaceous vegetation in this area. *Facing northwest.*



Photo #6: View of the eastern end of the Project area facing Coolidge Avenue. Staghorn sumac is visibly growing along the northern fence line between the property and adjacent commercial property and along the Coolidge Avenue fence line. *Facing northeast.*

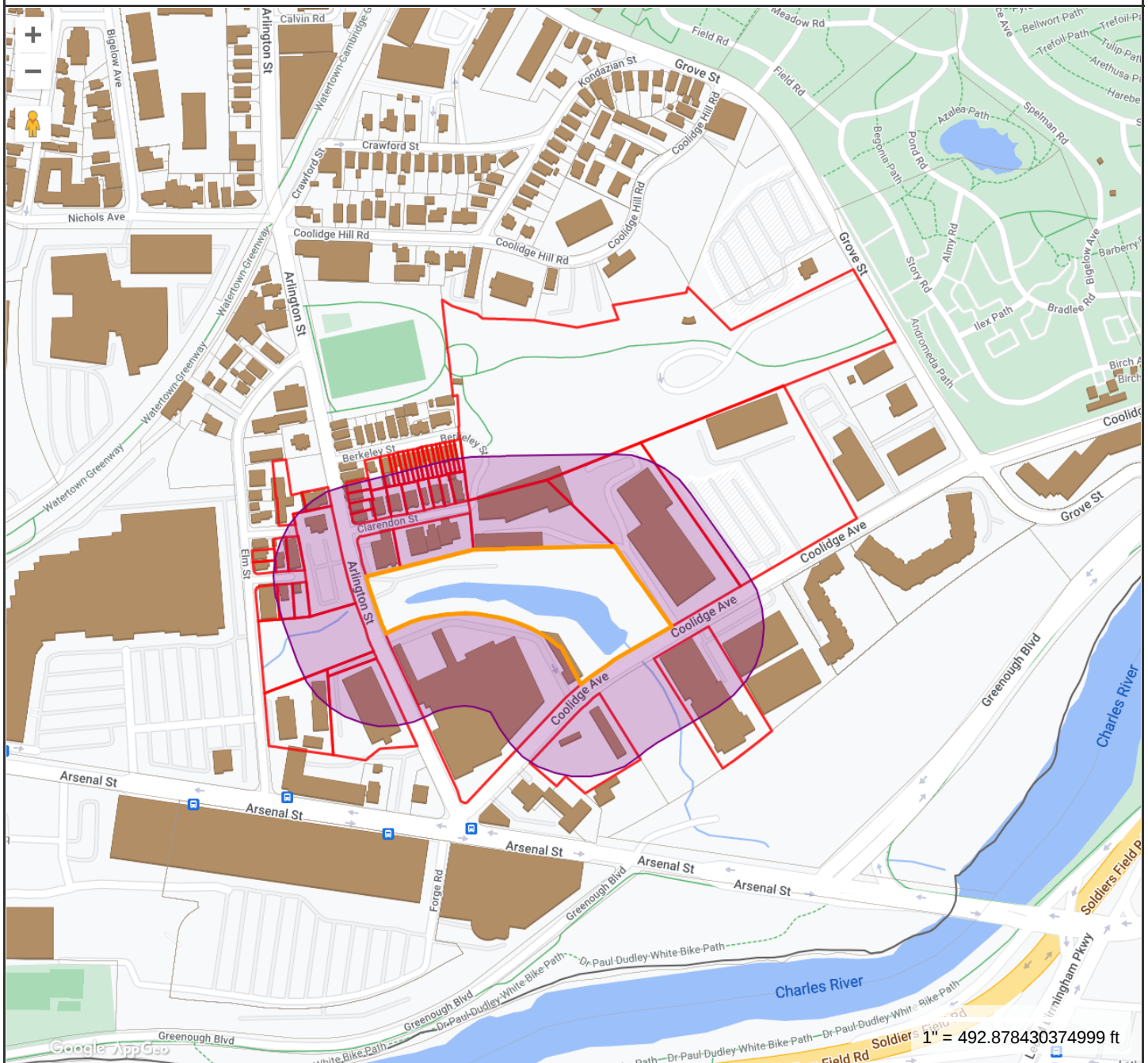
APPENDIX E

Certified List of Abutters

Abutter Notification Form

Affidavit of Service

300-foot Abutters to Sawins Pond Parcel



Property Information

Property ID 1510 1 0
 Location ARLINGTON ST
 Building Value 0
 Land Value 362,500
 Total Value 374,900



**MAP FOR REFERENCE ONLY
 NOT A LEGAL DOCUMENT**

City of Watertown, MA makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated November 30, 2021
 Data updated Daily

Print map scale is approximate.
 Critical layout or measurement
 activities should not be done using
 this resource.

SURREY ROAD LLC
1236 1K 0
41 SEYON STREET
WALTHAM, MA 02453

HATZIILIADES MAXIMOS
1236 2 0
5 MADISON ST
BELMONT, MA 02178

SURREY ROAD LLC
1236 3F 0
41 SEYON ST, STE 200
WALTHAM, MA 02453

ELM STREET PROPERTY OWNER, LLC
1236 4 G
930 COMMONWEALTH AVE SOUTH
BOSTON, MA 02215

HANLON, JR MICHAEL F.
1237 11 0
7 YUKON AVE
WATERTOWN, MA 02472

FORD GEORGE
1237 12C 0
42 VINELAND STREET
BRIGHTON, MA 02135

WOLF STEVEN T, TRUSTEE
1237 13A 0
C/O STEVEN WOLF
WAYLAND, MA 01778

BUSTEED HARRY
1237 14 0
8 YUKON AV
WATERTOWN, MA 02472

KALAKIDIS SOTIRIA
1237 15 5
57 ELM ST
WATERTOWN, MA 02472

NERPOUNI KATHLEEN
1237 16 4
59 ELM STREET
WATERTOWN, MA 02472

BUSA ROBERT E.
1237 2A 65
30 MALLARD WAY
WALTHAM, MA 02154

MASREAL CO INC
1237 2B C
55 GLENLAKE PKWY NE
ATLANTA, GA 30328

10 MUNROE LLC
1237 32F 0
10 MUNROE AVENUE
WATERTOWN, MA 02472

DERMENJIAN CHARLES
1237 9 6
374 LAKE STREET
BELMONT, MA 02478

AGGREGATE INDUSTRIES -
1401 1E 0
6211 ANN ARBOR ROAD
DUNDEE, MI 48131

ARE-MA REGION NO. 77, LLC
1401 3B A
PO BOX 847
CARLSBAD, CA 92018

WATERTOWN, TOWN OF FILIPPELLO PARK
1507 1B 0
149 MAIN ST
WATERTOWN, MA 02472

MASREAL COMPANY INC
1507 2 0
55 GLENLAKE PARKWAY NE
ATLANTA, GA 30328

URELL ALAN R
1507 3 0
86 COOLIDGE AVE
WATERTOWN, MA 02472

BARCLAY WATER TREATMENT CO.INC
1507 5 1
55 CHAPEL ST
NEWTON, MA 02458

MASREAL COMPANY INC
1509 1 0
55 GLENLAKE PKWY NE
ATLANTA, GA 30328

HATZIILIADES MAXIMOS TRUSTEE
1510 3 0
5 MADISON ST
BELMONT, MA 02478

RED COAT REALTY LLC
1510 5A 0
P O BOX 540045
WALTHAM, MA 02454-0045

TANCREDO SILVIO
1511 15 48
44 CLARENDON ST
WATERTOWN, MA 02472

PIRZADA VAZEER
1511 17 46
5 KONDAZIAN ST
WATERTOWN, MA 02472

PIRZADA VAZEER
1511 18 45
5 KONDAZIAN ST
WATERTOWN, MA 02472

LIANG JOE
1511 19 43
10 ADAMSON ST
ALLSTON, MA 02134

CHEN CHEN
1511 21 42
126 BUTTRICK LANE
CARLISLE, MA 01741

DILIBERTO JOE P.
1511 23 40
25 EVERGREEN AVENUE
WELLESLEY, MA 02482

YE WEI
1511 25 37
228 WASHINGTON ST
WESTWOOD, MA 02090

BOYD, GALE M AND ERIC C. TRUSTEES
1511 27 36
81 ARLINGTON ST
WATERTOWN, MA 02472

BEDROSIAN GREGORY TRUSTEE ET
1511 28 35
83 ARLINGTON ST UNIT 2
WATERTOWN, MA 02472

NIU XIANG
1511 29 34
20 REEVES RD
BEDFORD, MA 01730

MAGUIRE ISABELLA TRUSTEE
1511 31 33
87 ARLINGTON ST
WATERTOWN, MA 02472

REYNOLDS JR CHARLES
1511 34 28
9 BERKELEY ST
WATERTOWN, MA 02472

BLANCHARD DOUG
1511 36A 0
11 BERKELEY ST
WATERTOWN, MA 02472

PARIURY JACKIE M.
1511 36B 0
13 BERKELEY STREET
WATERTOWN, MA 02472

SURRETTE, RICHARD F
1511 36C 0
15 BERKELEY ST
WATERTOWN, MA 02472

BRODSKY ARCHIE
1511 36D 0
17 BERKELEY STREET
WATERTOWN, MA 02472

BLANCHETTE HEATHER
1511 36E 0
19 BERKELEY ST
WATERTOWN, MA 02472

CASSIDY CHRISTINE
1511 36F 0
21 BERKELEY ST
WATERTOWN, MA 02472

TORCHIO RALPH F
1511 36G 0
23 BERKELEY ST
WATERTOWN, MA 02472

BRACCINI JANICE E
1511 36H 0
25 BERKELEY ST - U1
WATERTOWN, MA 02472

TANNER ALYSSA
1511 36H 0B
25 BERKELEY ST - U2
WATERTOWN, MA 02472

SPEROS ANNA L/E
1511 36I 0
27 BERKELEY ST
WATERTOWN, MA 02472

ROSATI FLORA
1511 36J 0
29 BERKELEY ST
WATERTOWN, MA 02472

STENIS SYLVIE L/E
1511 36K 0
31 BERKELEY ST
WATERTOWN, MA 02472

KNOLL JACOB R
1511 36L 0
33 BERKELEY ST
WATERTOWN, MA 02472

STEINER LILY
1511 36M 0
35 BERKELEY ST
WATERTOWN, MA 02472

37 BERKELEY ST LLC
1511 36N 0
38 SCHOOL ST
ARLINGTON, MA 02476

SPEROS ANNA L/E
1511 36O 0
27 BERKELEY ST
WATERTOWN, MA 02472

PIPPOS SPIROS
1511 36P 0
41 BERKELEY ST
WATERTOWN, MA 02472

NOTIFICATION TO ABUTTERS

WATERTOWN WETLANDS ORDINANCE MASSACHUSETTS WETLANDS PROTECTION ACT M.G.L. C. 131.§40

An Application for Permit and a Notice of Intent has been filed with the Watertown Conservation Commission seeking permission to remove, fill, dredge or alter an area subject to protection under G.L. Ch. 131.§40 and/or the Watertown Wetlands Ordinance.

The name of the Applicant is Maximos Hatziliades.

The address of the land where the activity is proposed is 0 Arlington Street- Sawins Pond Parcel (42.364755, -71.152585).

The work proposed is the construction of a parking area north of Sawins Pond between the existing paved parking area off Arlington Street and Coolidge Avenue.

Copies of the Application for Permit and Notice of Intent and accompanying plans may be examined at the office of the Watertown Conservation Commission, Town Hall (3rd floor), 149 Main Street, Watertown MA during regular business hours.

For more information, call 413-256-0202 or email: polina.safran@swca.com

Check one: This is the Applicant [☐], Applicant's representative [X ☒], or other [specify].

Copies of the Application for Permit and Notice of Intent may be obtained from either (check one) the Applicant [☐] or the Applicant's representative [X ☒], by calling 413-256-0202 between 9 am – 5pm on Monday through Friday or email at polina.safran@swca.com.

Notice of the public hearing to be held on January 4 at 7pm at Watertown City Hall, 149 Main Street in Watertown and will be published in the *Watertown Tab* and will be posted outside the Town Clerk's office on the first floor of the Watertown Town Hall, at least five business days in advance of the hearing.

Contact the Watertown Conservation Commission of the MA Department of Environmental Protection (DEP) Northeast Region Office for information about this Application or the Wetlands Protection Act, and the Commission regarding the Watertown Wetlands Ordinance.

Watertown Conservation Commission
(617) 972-6426
<http://www.watertown-ma.gov/index.aspx?nid=103>

MassDEP Northeast Region Office
(978) 694-3200
<http://www.mass.gov/dep/>



ENVIRONMENTAL CONSULTANTS

Sound Science. Creative Solutions.®

Amherst Office
15 Research Drive
Amherst, Massachusetts 01002
Tel 413.256.0202 Fax 413.256.1092

AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act

I, _____, hereby certify under the pains and penalties of perjury that on _____, I gave notification to abutters in compliance with the Massachusetts Wetlands Protection Act and the Watertown Wetlands Ordinance in connection with the following matter:

A Notice of Intent filed under the Massachusetts Wetlands Protection Act and the Watertown Wetlands Protection By-law by Maximos Hatziliades with the Watertown Conservation Commission on December 14, 2022. The form of notification, and a list of the abutters to whom it was given and their addresses, are attached to the Affidavit of Service.

Name _____

Date _____

APPENDIX F

Stormwater Checklist

DRAINAGE CALCULATIONS

for the

PROPOSED PARKING LOT IMPROVEMENTS

located at

**Arlington Street & Coolidge Avenue
(Parcel ID: 1510 1 0)
Watertown, Massachusetts**

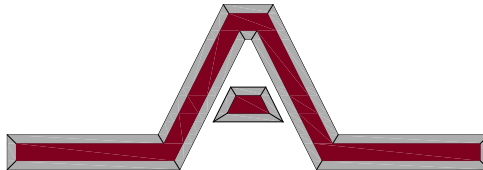
Submitted to:

**Town of Watertown
149 Main Street
Watertown, Massachusetts 02472**

Prepared for:

**Maximos Hatziliades
71 Arlington Street
Watertown, Massachusetts 02472**

Prepared by



Engineering Alliance, Inc.

Civil Engineering & Land Planning Consultants
194 Central Street
Saugus, MA 01906
Tel: (781) 231-1349
Fax: (781) 417-0020

1950 Lafayette Road
Portsmouth, NH 03801
Tel: (603) 610-7100
Fax: (603) 610-7101

December 12, 2022

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▪ APPENDIX A	Existing Conditions Drainage Calculations Existing Watershed Plan
▪ APPENDIX B	Proposed Conditions Drainage Calculations Proposed Watershed Plan
▪ APPENDIX C	Best Management Practice Maintenance Plan
▪ APPENDIX D	Stormwater Checklist & Miscellaneous Drainage Calculations

**Proposed Commercial Re-development
Arlington Street and Coolidge Avenue
Watertown, MA 02472**

Project Description

The project consists of the re-development of a parcel of land located at Arlington Street and Coolidge Avenue (Parcel ID: 150 1 0) in Watertown, Massachusetts. The proposed work includes the installation of a 41,289 s.f. parking lot which will be constructed with porous asphalt pavement, parking lot signage and striping, landscaped areas, buffer zone enhancement area, and incidental site work. The parking lot will be accessed through existing curb cuts located on Arlington Street and Coolidge Avenue. All of the work will occur within the 150-ft (Watertown Local By-Law) buffer zone associated with Sawin's Pond.

Site Description

The site is located in the Industrial-2 (I-2) zoning district and is comprised of 4.97± acres. The subject property is bordered by Arlington Street to the west, commercial and industrial uses to the north, east, and south, and Coolidge Avenue to the southeast. Sawin's Pond covers approximately half of the southern portion of the parcel. The remainder of the site is primarily wooded with the exception of a 1,580± s.f. paved parking area in the northwest corner. Sawin's Pond receives drainage from Williams Pond and municipal drainage from Arlington Street through concrete culverts located in the eastern and western portion of the subject property. In addition, the existing parking area and the adjacent property to the south discharge storm water into the pond. The water level of Sawin's Pond is controlled by a dam that directs flow through culverts beneath Coolidge Avenue. The banks of Sawin's Pond contain debris such as rubber, tarps, and building materials. The site was reportedly approved in 1966 by the Town of Watertown and state officials as a dump/landfill owned and operated by B.F. Goodrich at the time.

The existing parking area is graded in such a way so as to direct storm water into the two existing catch basins which discharge into Sawin's Pond via an existing headwall. The remainder of the upland slopes range from 2-4%, while the banks of Sawin's Pond have slopes up to 50%. Although the majority of the site is lightly wooded, the majority of the vegetation is non-native. Photos pre-1970 seem to indicate that the entire site had been clear cut while the dump/landfill operations were on-going.

Soils information was obtained from the USDA Natural Resources Conservation Service (NRCS) Maps and available data for Middlesex County. The onsite soils are classified as Urban Land and Udorthents, sandy. Refer to Figure 5 – Soils Map for a delineation of the boundaries of the soil with respect to the subject parcel and the attached NRCS soil description information. The Flood Insurance Rate Map for the Town of Watertown (Community Panel 25017C0557E, June 4, 2010) describes the project site as Zone X. Zone X is classified as an area of minimal flooding. Refer to Figure 2 – FEMA Flood Map for a delineation of the flooding zones in relation to the subject parcel. All lot lines, topography, utilities, and other existing site information was compiled from a field survey performed by Otte & Dwyer Land Surveyors, Inc. and record plans.

Low Impact Development Considerations

In accordance with the Massachusetts Department of Environmental Protection (DEP) Stormwater Management Standards multiple options were considered when designing the proposed parking area. The Stormwater Management Standards require a project proponent to analyze various alternatives to the proposed design in an effort to minimize disturbances to the resource areas.

The preferred option (the proposal) provides a significant amount of storm water treatment through the use of porous asphalt (the DEP recognizes an 80% TSS removal rate for this BMP), and reduces the risk of additional point source discharges and scouring along the banks of the pond. It also ensures that the peak flow entering Sawin's Pond in the post-development condition will not exceed the pre-development condition. All proposed encroachments within fifty (50) feet of the resource area have been reduced to the greatest extent possible.

Pre-Development Condition

Technical Release 20 (TR-20) Program for Project Formulation Hydrology developed by the Soil Conservation Service (SCS) was employed to develop pre- and post-development peak flows. Drainage calculations were performed for the pre-development condition for the 2, 10, 25, and 100-year type III 24-

hour storm events. Rainfall intensities were obtained from the NOAA Atlas 14. Refer to Section III for computer results, soil characteristics, cover descriptions and times of concentrations calculations.

In the pre-development storm water analysis, a watershed area totaling 65,414 s.f. was analyzed. This area is limited to the on-site area that is proposed to be developed and off-site tributary areas. Existing Watershed #1 (EWS-1) encompasses 37,006 s.f. and is the area that directs flows offsite (Design Point #1). Existing Watershed #2 (EWS-2) totals 28,408 s.f. and is the area that is tributary to Sawin's Pond (Design Point #2). Refer to the Existing Watershed Plan (EWP) in Section III for a delineation of the watershed areas as well as the location of the design point.

A summary of the peak rates of runoff during the Pre-Development Condition is as follows:

Pre-Development Condition Peak Discharge Summary:

	2-Year Storm (3.26 IN)	10-Year Storm (5.15 IN)	25-Year Storm (6.32 IN)	100-Year Storm (8.14 IN)
Design Point #1 (Offsite)	0.89 CFS	2.02 CFS	2.76 CFS	3.95 CFS
Design Point #2 (Sawin's Pond)	0.73 CFS	1.65 CFS	2.25 CFS	3.22 CFS

Post-Development Condition

The proposed development consists of the construction of a 41,289 s.f. porous asphalt parking area with bituminous concrete curb that will connect to the existing 15,815 s.f. bituminous concrete parking area. Tree box filters have also been provided to further increase groundwater recharge. All of the work will occur on land that had been previously disturbed and/or developed. The porous asphalt will provide storm water treatment and promote ground water recharge. Overflow from storm events greater than the 100-year storm will enter the tree box filters. Buffer zone enhancement in the form of a rock rip rap strip and native plantings will be provided between the edge of the proposed parking area and the top of the Sawin's Pond bank for stabilization and to help dissipate flows into the pond.

The porous asphalt has been designed to infiltrate all storm water for storm events up to and including the 100-year storm and to prevent surface runoff from directly entering Sawin's Pond or the abutting properties and streets. In the unlikely event (storm in excess of the 100-year storm) that the porous asphalt should overtop, the parking area has been graded to direct storm water flows into tree box filters.

The drainage calculations were performed for the post-development condition for the 2, 10, 25, and 100-year type III 24-hour storm events. The same area (65,414 s.f.) and two design points used in the pre-development model were analyzed for the post-development condition. The area that directs flow offsite (DP-1) is Proposed Watershed #1 (PWS-1) and consists of 8,788 s.f. Proposed Watershed #2 (PWS-2) consists of 15,337 s.f. and directs flows to Sawin's Pond (DP-2). Proposed Watershed #3 includes 41,298 s.f. of proposed porous asphalt. Refer to Section III for computer results, soil characteristics, cover descriptions, times of concentrations calculations, and the Proposed Watershed Plan (PWP).

A summary of the peak rates of runoff during the post-development condition is as follows:

Post-Development Condition Peak Discharge Summary:

	2-Year Storm (3.26 IN)	10-Year Storm (5.15 IN)	25-Year Storm (6.32 IN)	100-Year Storm (8.14 IN)
Design Point #1 (Offsite)	0.24 CFS	0.59 CFS	0.82 CFS	1.19 CFS
Design Point #2 (Sawin's Pond)	0.34 CFS	0.83 CFS	1.16 CFS	1.68 CFS
% Reduction (DP-1)	-73%	-71%	-71%	-70%
% Reduction (DP-2)	-53%	-50%	-48%	-48%

As indicated by the table above, the peak rate of runoff has been mitigated for all storms up to and including the 100-year storm event for both design points. Peak flows have been reduced by between 48% and 73%.

Porous Asphalt

The porous asphalt is proposed to act as the onsite best management practice that provides the Massachusetts DEP required recharge volume, the required water quality treatment volume, and the required TSS removal. The porous asphalt system consists of a six (6) inch layer of porous asphalt over a “choker course” consisting of four (4) inches of 3/4” crushed stone. A “filter course” of twelve (12) inches of bank run gravel is beneath the “choker course.” Below the “filter course” is a “filter blanket” of three (3) inches of 3/8” pea gravel and a “reservoir course” consisting of four (4) inches of 3/4” crushed stone. These layers are in accordance with the detail provided by the University of New Hampshire and shown in Volume 2 Chapter 2 of the Stormwater Management Standards. The required recharge volume and water quality treatment volume was calculated using the formulas provided in Standard 3 and Standard 4 of the Stormwater Management Standards. This volume is recharged through the gravel base provided beneath the porous asphalt. Sizing of this gravel base was accomplished by using the HydroCad 9.0. The infiltration rate was assumed to be 0.17 inches/hour based on Table 2.3.3 1982 Rawls Rates found in the Stormwater Management Standards. The “filter course” has the capacity to hold stormwater for storm events up to and including the 100-year storm event. Only the “filter course” was considered as storage for the hydraulic calculations.

Porous asphalt also provides stormwater treatment by allowing flows to pass through the void space in the asphalt mix. The asphalt is mixed with a low content of fine sand so there is 10%-25% void space. Porous asphalt can infiltrate as much as 70%-80% of annual rainfall and, coupled with regular sweeping, will provide the DEP minimum required TSS of 80%.

Tree Box Filters

Although the porous asphalt is expected to fully capture and infiltrate all stormwater for storm events up to and including the 100-year storm, tree box filters have been provided for additional stormwater treatment and recharge. A bituminous curb has been provided to direct flows into these tree boxes in the event of a storm event in excess of the largest design storm. Each tree box filter consists of a tree in an open bottom concrete barrel with an underdrain in crushed gravel, surrounded by a porous soil media. Stormwater captured in the filter percolates into the underlying soil. Flows in excess of the capacity of the filter are directed through the underdrain.

Erosion and Siltation Control

Rows of hay bales and siltation fence will be placed at the limit of work prior to the commencement of any construction activity. The integrity of the hay bales and silt fence will be maintained by periodic inspection and replaced as necessary. The hay bales and silt fence will remain in place until the first course of pavement has been placed and vegetation has been established.



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PROJECT:

Notice of Intent

Arlington Street & Coolidge Street
 Watertown, MA 02472

PROJECT: 09-27801

SCALE: 1:25,000

DESIGNED BY: Calvin Reach

DATE: August 5, 2022

DWG FILE NAME: Figures.dwg

CHECKED BY: Richard A. Salvo, P.E.

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FIGURE 1 - USGS LOCUS MAP

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1 of 5



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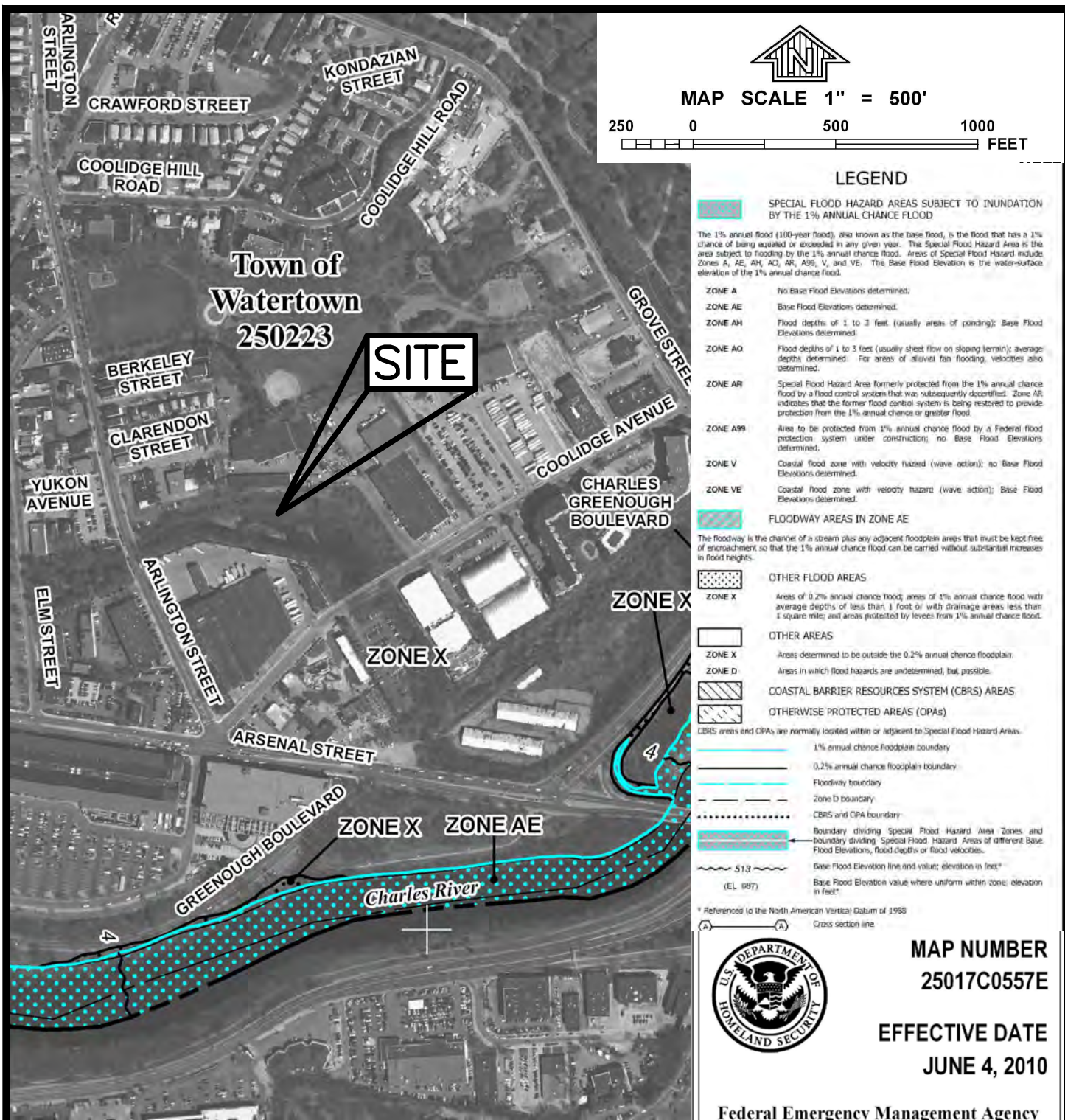
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FIGURE 2 - ORTHO PHOTO

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FIGURE 3 - FEMA FLOOD MAP

Page #:

3 of 5



LEGEND:

-  - NHESP ESTIMATED HABITATS OF RARE SPECIES
-  - NHESP PRIORITY HABITATS OF RARE SPECIES
-  - NHESP CERTIFIED VERNAL POOLS

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SCALE: 1:25,000

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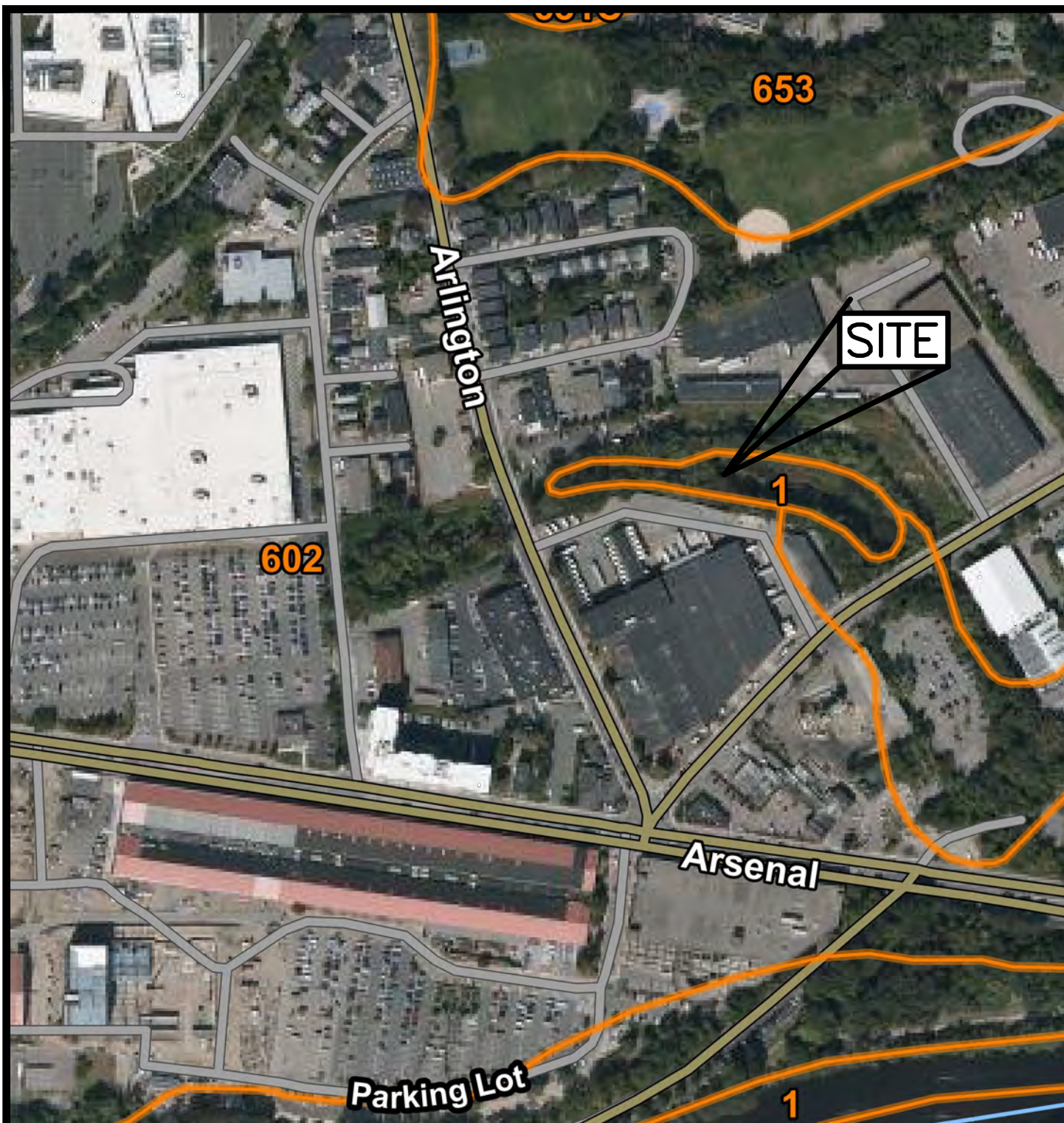
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FIGURE 4 - NATURAL HERITAGE MAP

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PROJECT: 09-27801

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FIGURE 5 - SOILS MAP

Page #:

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Middlesex County, Massachusetts

1—Water

Map Unit Setting

National map unit symbol: 996p

Frost-free period: 110 to 200 days

Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Setting

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Dip

Down-slope shape: Linear

Across-slope shape: Linear

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts

Survey Area Data: Version 22, Sep 9, 2022

Middlesex County, Massachusetts

602—Urban land

Map Unit Setting

National map unit symbol: 9950

Elevation: 0 to 3,000 feet

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 110 to 200 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Excavated and filled land

Minor Components

Udorthents, loamy

Percent of map unit: 5 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Landform: Ledges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Head slope

Down-slope shape: Concave

Across-slope shape: Concave

Udorthents, wet substratum

Percent of map unit: 5 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts

Survey Area Data: Version 22, Sep 9, 2022

Middlesex County, Massachusetts

653—Udorthents, sandy

Map Unit Setting

National map unit symbol: vr1k

Elevation: 0 to 3,000 feet

Mean annual precipitation: 32 to 50 inches

Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 110 to 200 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, sandy, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Sandy

Setting

Parent material: Loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till

Properties and qualities

Slope: 0 to 25 percent

Depth to restrictive feature: More than 80 inches

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Minor Components

Udorthents, loamy

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent

Urban land

Percent of map unit: 5 percent

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

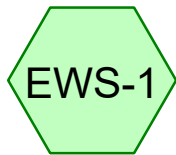
Data Source Information

Soil Survey Area: Middlesex County, Massachusetts

Survey Area Data: Version 22, Sep 9, 2022

APPENDIX A

**Existing Conditions Drainage Calculations
Existing Watershed Plan**



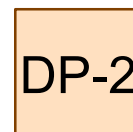
Existing Waterhsed 1



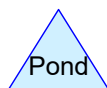
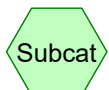
DP-1-Flow Offsite



Existing Watershed 2



DP-2-Sawin's Pond



Routing Diagram for Existing conditions

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Existing conditions

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Page 2

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year Storm	Type III 24-hr		Default	24.00	1	3.26	2
2	10-Year Storm	Type III 24-hr		Default	24.00	1	5.15	2
3	25-Year Storm	Type III 24-hr		Default	24.00	1	6.32	2
4	100-Year Storm	Type III 24-hr		Default	24.00	1	8.14	2

Existing conditions

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Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.502	77	Woods, Poor, HSG C (EWS-1, EWS-2)
1.502	77	TOTAL AREA

Existing conditions

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Page 4

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.502	HSG C	EWS-1, EWS-2
0.000	HSG D	
0.000	Other	
1.502		TOTAL AREA

Existing conditions

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	1.502	0.000	0.000	1.502	Woods, Poor	EWS-1, EWS-2
0.000	0.000	1.502	0.000	0.000	1.502	TOTAL	
						AREA	

Existing conditions*Type III 24-hr 2-Year Storm Rainfall=3.26"*

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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

Subcatchment EWS-1: Existing Watershed 1 Runoff Area=37,006 sf 0.00% Impervious Runoff Depth>1.25"
Flow Length=207' Tc=16.0 min CN=77 Runoff=0.89 cfs 0.088 af

Subcatchment EWS-2: Existing Watershed 2 Runoff Area=28,408 sf 0.00% Impervious Runoff Depth>1.25"
Flow Length=76' Slope=0.0370 '/' Tc=13.7 min CN=77 Runoff=0.73 cfs 0.068 af

Reach DP-1: DP-1-Flow Offsite

Inflow=0.89 cfs 0.088 af

Outflow=0.89 cfs 0.088 af

Reach DP-2: DP-2-Sawin's Pond

Inflow=0.73 cfs 0.068 af

Outflow=0.73 cfs 0.068 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.156 af Average Runoff Depth = 1.25"
100.00% Pervious = 1.502 ac 0.00% Impervious = 0.000 ac

Existing conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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Summary for Subcatchment EWS-1: Existing Waterhsed 1

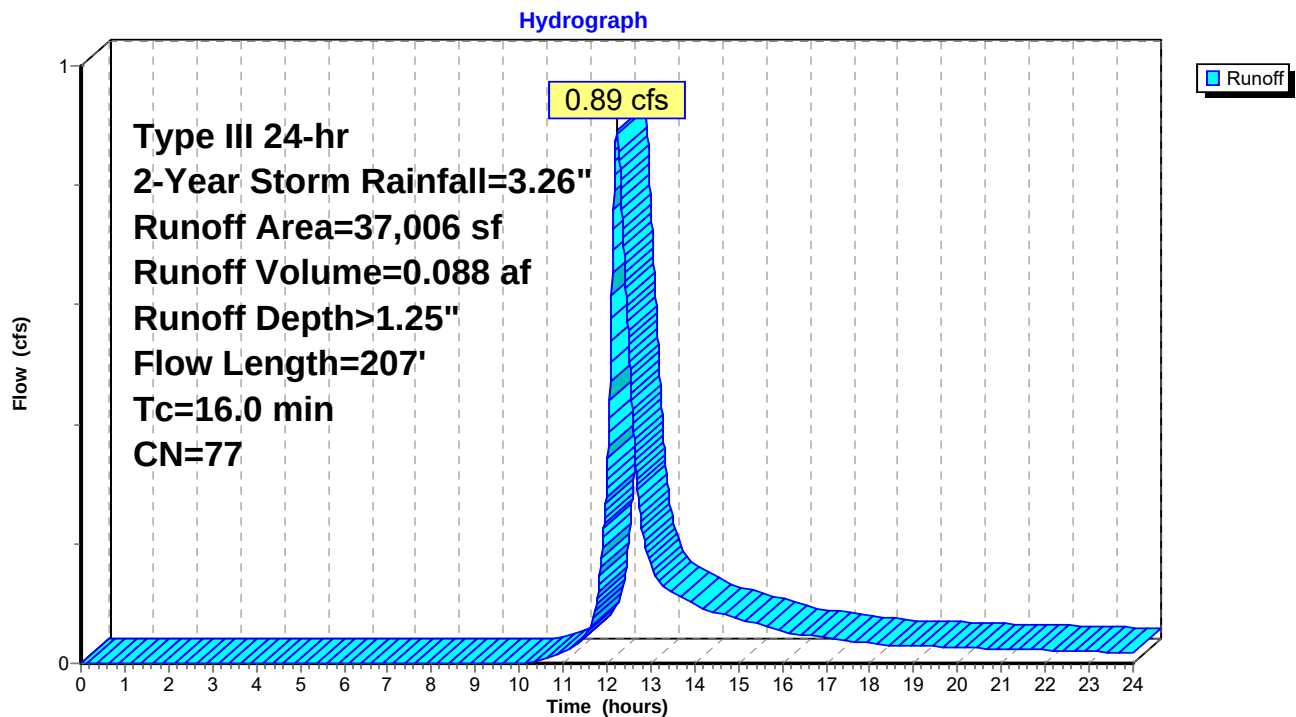
Runoff = 0.89 cfs @ 12.23 hrs, Volume= 0.088 af, Depth> 1.25"

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 Storm Rainfall=3.26"

Area (sf)	CN	Description
37,006	77	Woods, Poor, HSG C
37,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	50	0.0186	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
3.1	157	0.0287	0.85		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.0	207	Total			

Subcatchment EWS-1: Existing Waterhsed 1



Existing conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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Summary for Subcatchment EWS-2: Existing Watershed 2

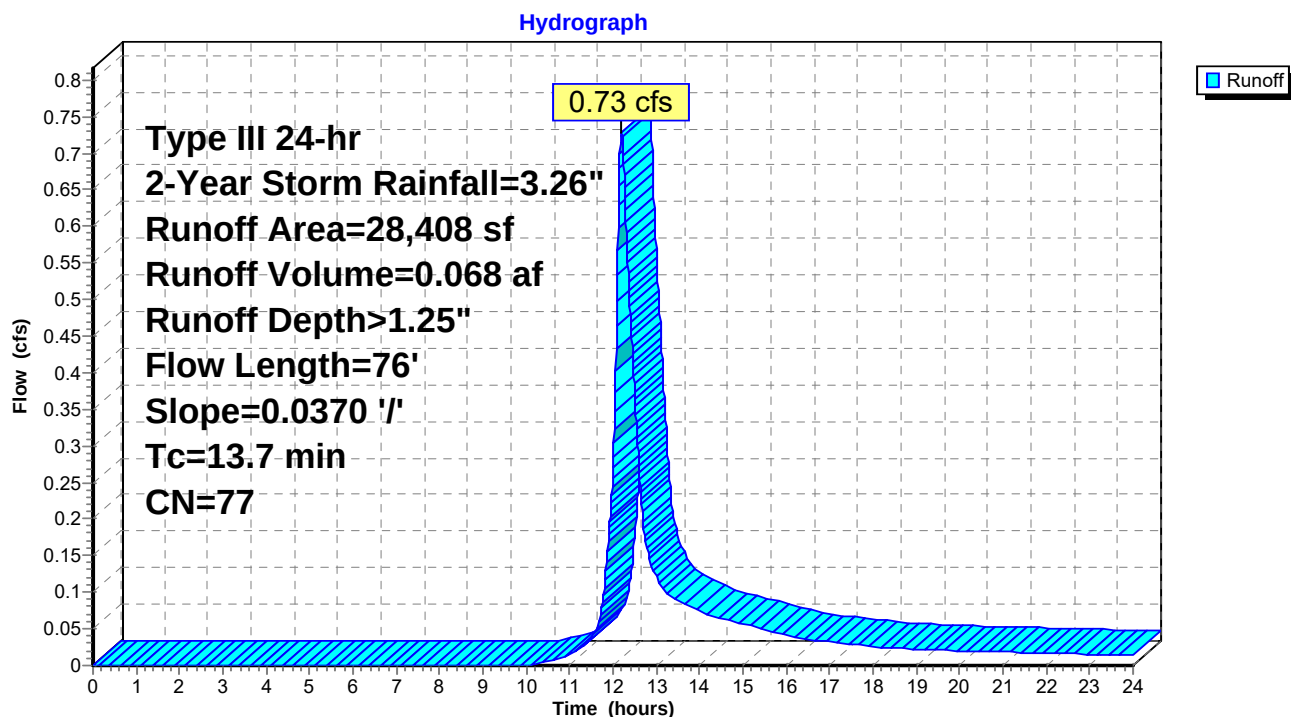
Runoff = 0.73 cfs @ 12.20 hrs, Volume= 0.068 af, Depth> 1.25"

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 Storm Rainfall=3.26"

Area (sf)	CN	Description
28,408	77	Woods, Poor, HSG C
28,408		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	76	0.0370	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"

Subcatchment EWS-2: Existing Watershed 2



Existing conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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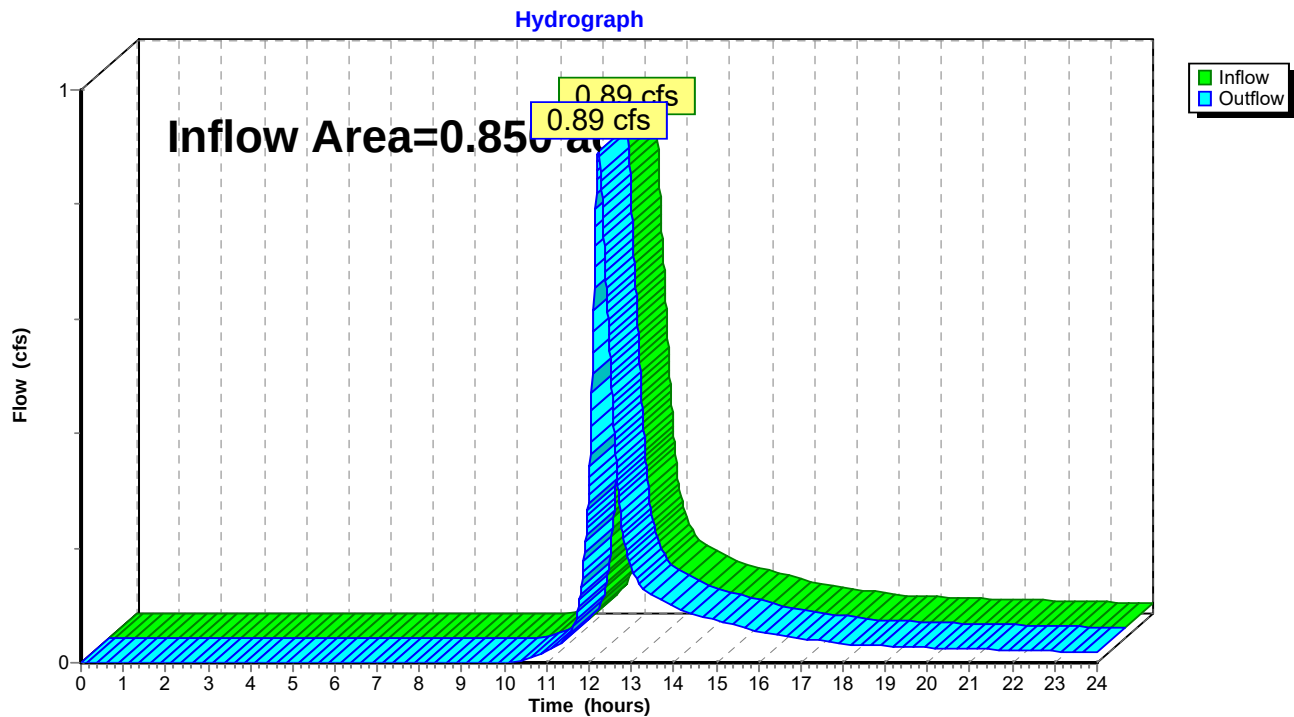
Page 9

Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.850 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-Year Storm event
Inflow = 0.89 cfs @ 12.23 hrs, Volume= 0.088 af
Outflow = 0.89 cfs @ 12.23 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



Existing conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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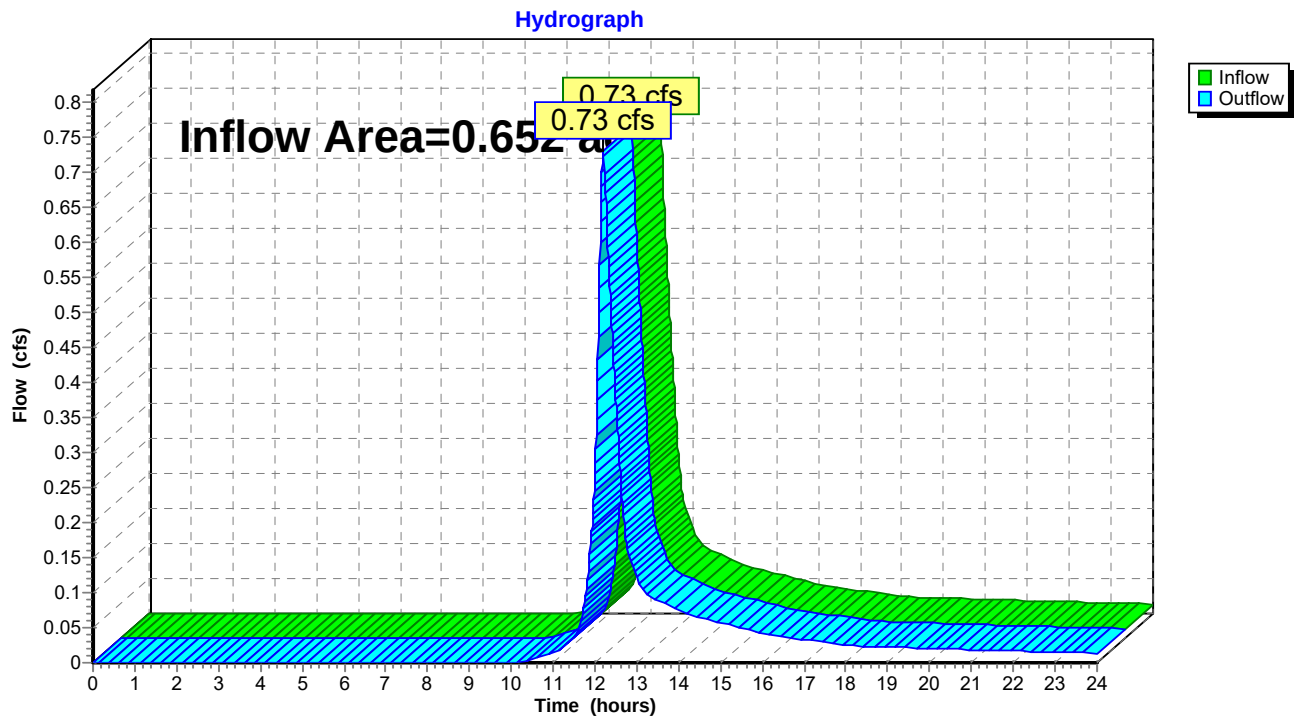
Page 10

Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 0.652 ac, 0.00% Impervious, Inflow Depth > 1.25" for 2-Year Storm event
Inflow = 0.73 cfs @ 12.20 hrs, Volume= 0.068 af
Outflow = 0.73 cfs @ 12.20 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



Existing conditions*Type III 24-hr 10-Year Storm Rainfall=5.15"*

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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

Subcatchment EWS-1: Existing Watershed 1 Runoff Area=37,006 sf 0.00% Impervious Runoff Depth>2.74"
Flow Length=207' Tc=16.0 min CN=77 Runoff=2.02 cfs 0.194 af

Subcatchment EWS-2: Existing Watershed 2 Runoff Area=28,408 sf 0.00% Impervious Runoff Depth>2.74"
Flow Length=76' Slope=0.0370 '/' Tc=13.7 min CN=77 Runoff=1.65 cfs 0.149 af

Reach DP-1: DP-1-Flow Offsite

Inflow=2.02 cfs 0.194 af

Outflow=2.02 cfs 0.194 af

Reach DP-2: DP-2-Sawin's Pond

Inflow=1.65 cfs 0.149 af

Outflow=1.65 cfs 0.149 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.343 af Average Runoff Depth = 2.74"
100.00% Pervious = 1.502 ac 0.00% Impervious = 0.000 ac

Existing conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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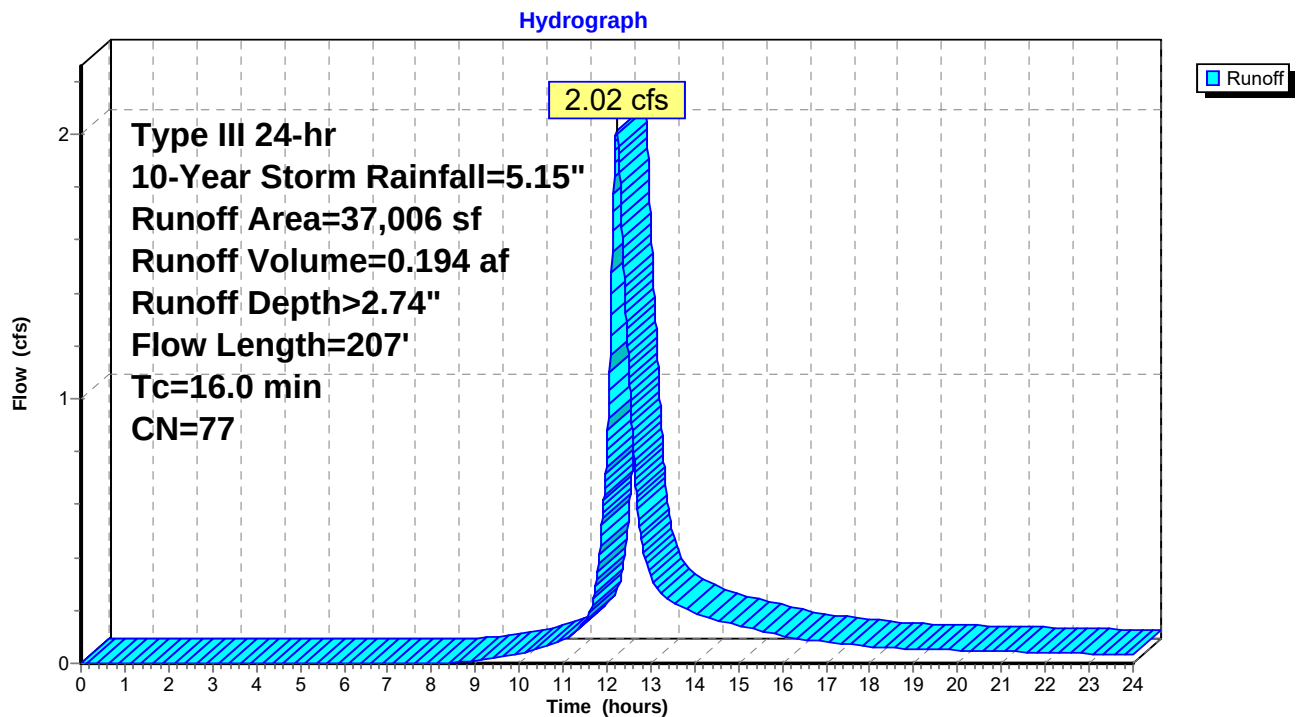
Summary for Subcatchment EWS-1: Existing Waterhsed 1

Runoff = 2.02 cfs @ 12.22 hrs, Volume= 0.194 af, Depth> 2.74"

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 Storm Rainfall=5.15"

Area (sf)	CN	Description
37,006	77	Woods, Poor, HSG C
37,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	50	0.0186	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
3.1	157	0.0287	0.85		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.0	207	Total			

Subcatchment EWS-1: Existing Waterhsed 1

Existing conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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Summary for Subcatchment EWS-2: Existing Watershed 2

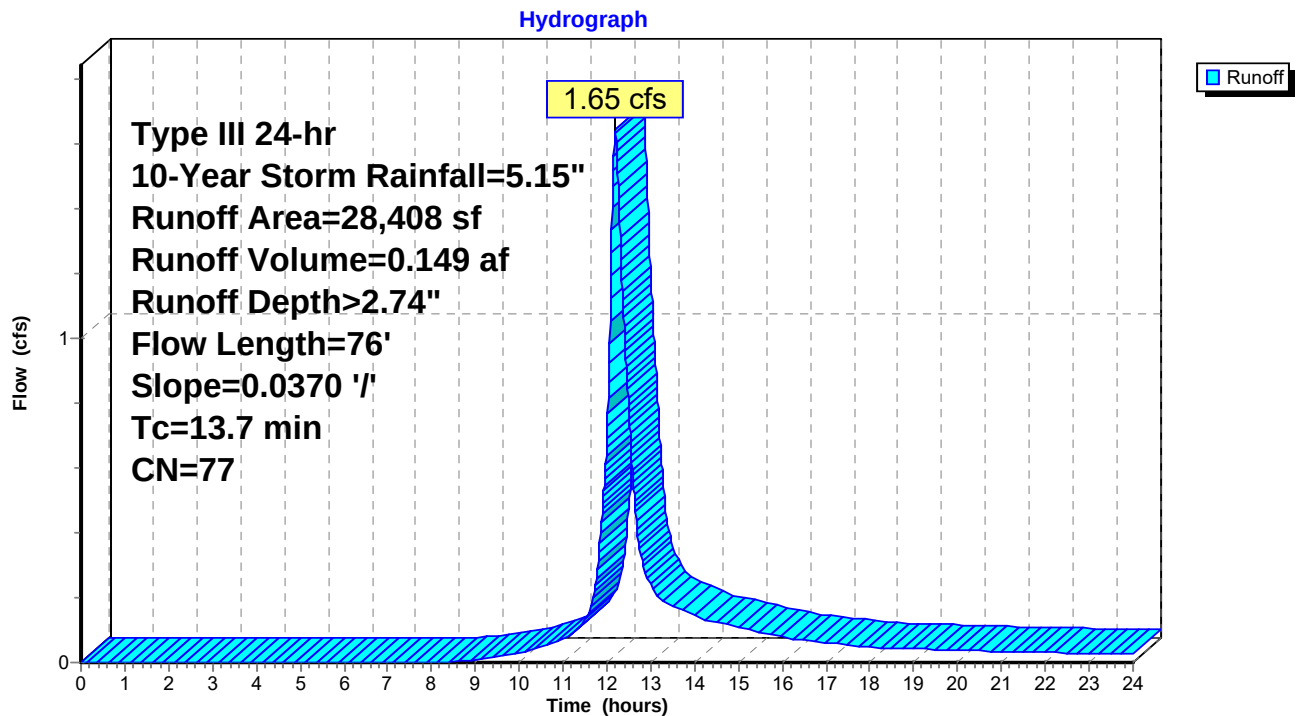
Runoff = 1.65 cfs @ 12.19 hrs, Volume= 0.149 af, Depth> 2.74"

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 Storm Rainfall=5.15"

Area (sf)	CN	Description
28,408	77	Woods, Poor, HSG C
28,408		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	76	0.0370	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"

Subcatchment EWS-2: Existing Watershed 2



Existing conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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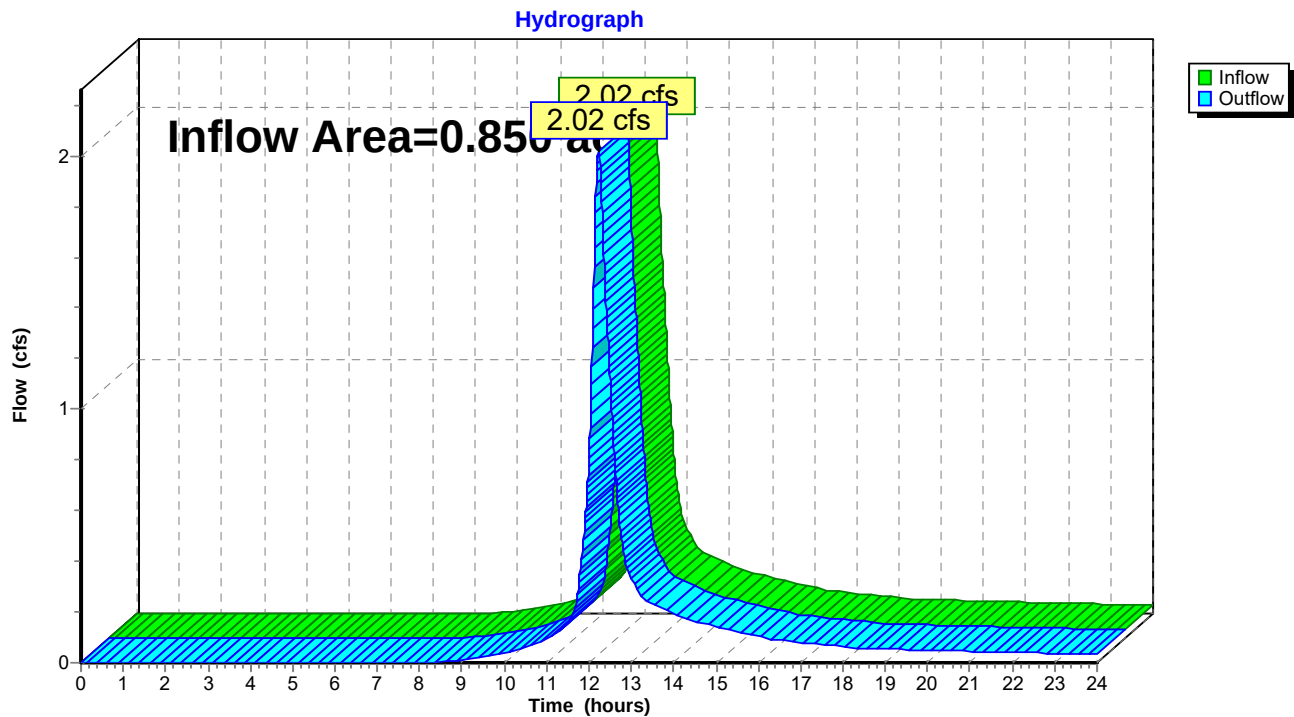
Page 14

Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.850 ac, 0.00% Impervious, Inflow Depth > 2.74" for 10-Year Storm event
Inflow = 2.02 cfs @ 12.22 hrs, Volume= 0.194 af
Outflow = 2.02 cfs @ 12.22 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



Existing conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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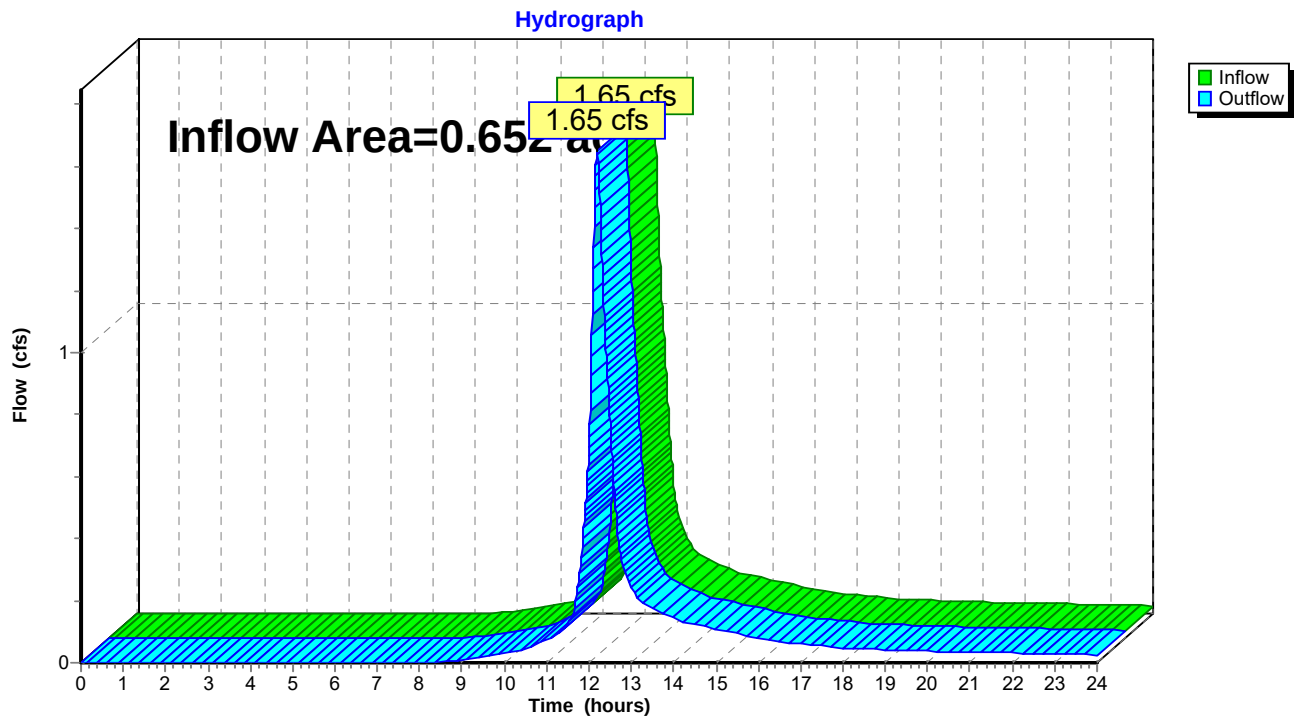
Page 15

Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 0.652 ac, 0.00% Impervious, Inflow Depth > 2.74" for 10-Year Storm event
Inflow = 1.65 cfs @ 12.19 hrs, Volume= 0.149 af
Outflow = 1.65 cfs @ 12.19 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



Existing conditions*Type III 24-hr 25-Year Storm Rainfall=6.32"*

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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

Subcatchment EWS-1: Existing Watershed 1 Runoff Area=37,006 sf 0.00% Impervious Runoff Depth>3.75"
Flow Length=207' Tc=16.0 min CN=77 Runoff=2.76 cfs 0.265 af

Subcatchment EWS-2: Existing Watershed 2 Runoff Area=28,408 sf 0.00% Impervious Runoff Depth>3.75"
Flow Length=76' Slope=0.0370 '/' Tc=13.7 min CN=77 Runoff=2.25 cfs 0.204 af

Reach DP-1: DP-1-Flow Offsite

Inflow=2.76 cfs 0.265 af

Outflow=2.76 cfs 0.265 af

Reach DP-2: DP-2-Sawin's Pond

Inflow=2.25 cfs 0.204 af

Outflow=2.25 cfs 0.204 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.469 af Average Runoff Depth = 3.75"
100.00% Pervious = 1.502 ac 0.00% Impervious = 0.000 ac

Existing conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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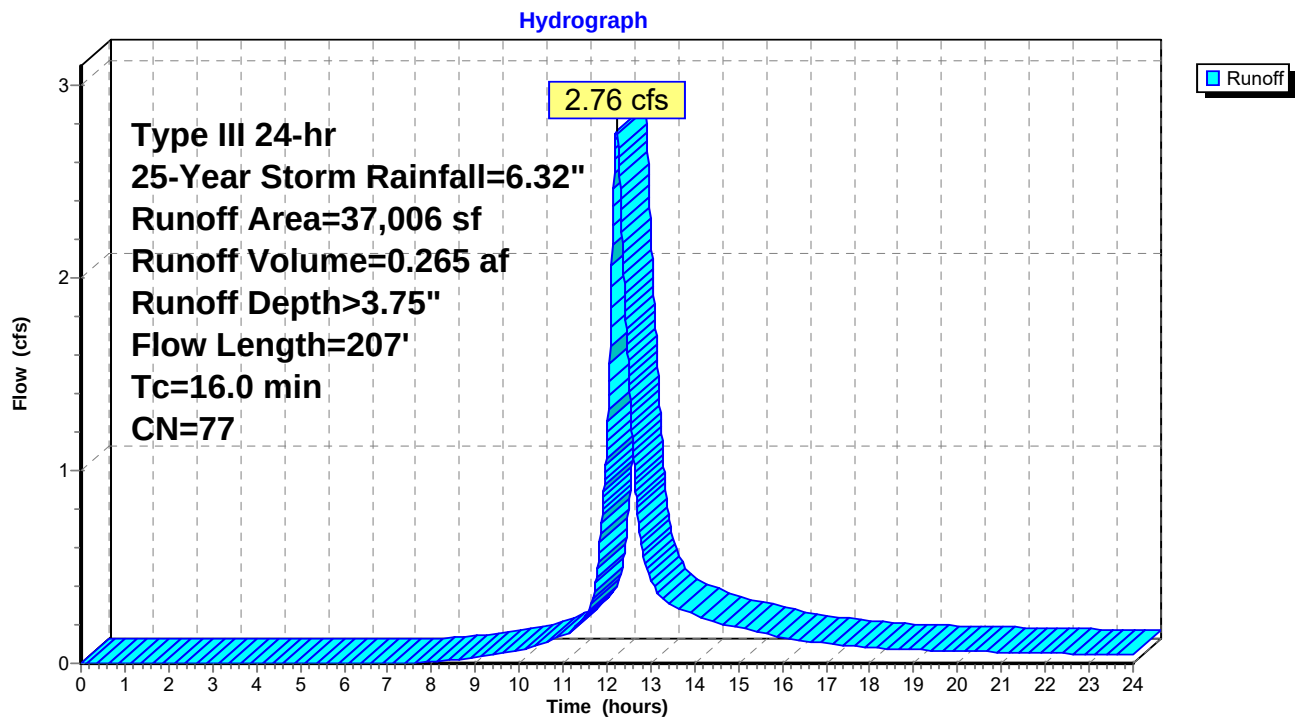
Summary for Subcatchment EWS-1: Existing Waterhsed 1

Runoff = 2.76 cfs @ 12.22 hrs, Volume= 0.265 af, Depth> 3.75"

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 25-Year Storm Rainfall=6.32"

Area (sf)	CN	Description
37,006	77	Woods, Poor, HSG C
37,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	50	0.0186	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
3.1	157	0.0287	0.85		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.0	207	Total			

Subcatchment EWS-1: Existing Waterhsed 1

Existing conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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Summary for Subcatchment EWS-2: Existing Watershed 2

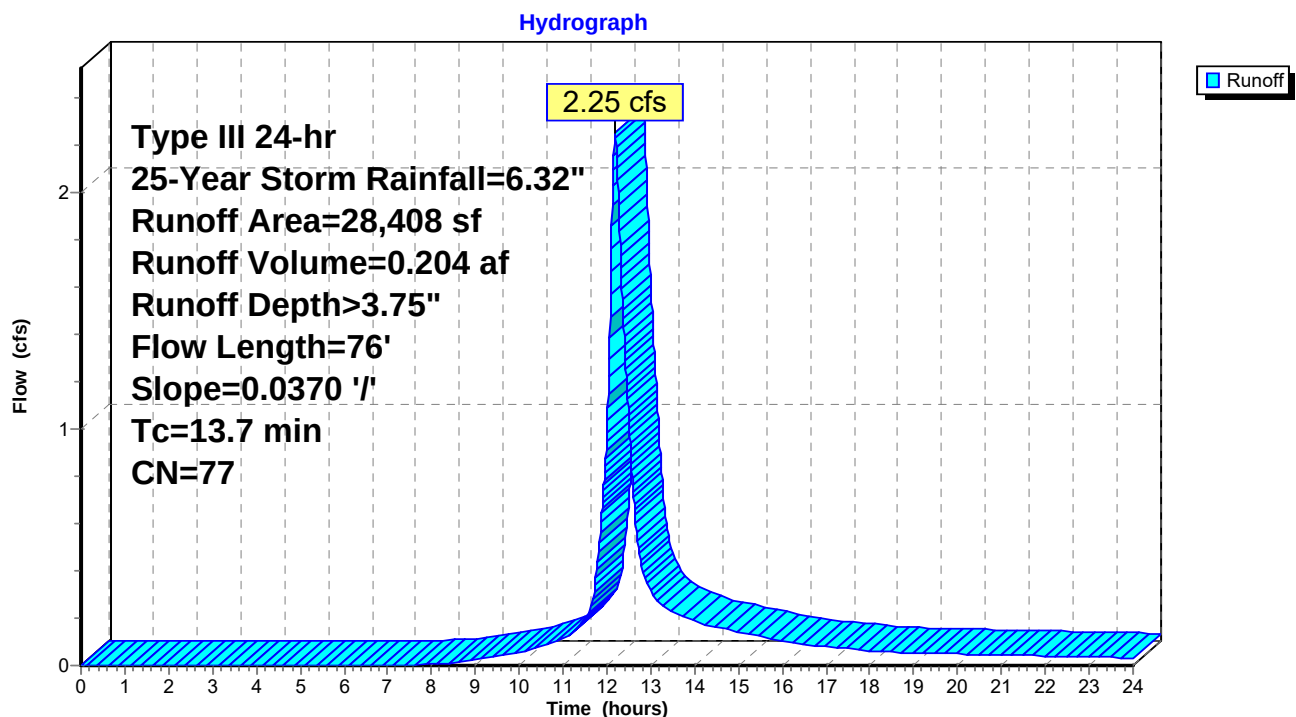
Runoff = 2.25 cfs @ 12.19 hrs, Volume= 0.204 af, Depth> 3.75"

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 25-Year Storm Rainfall=6.32"

Area (sf)	CN	Description
28,408	77	Woods, Poor, HSG C
28,408		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	76	0.0370	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"

Subcatchment EWS-2: Existing Watershed 2



Existing conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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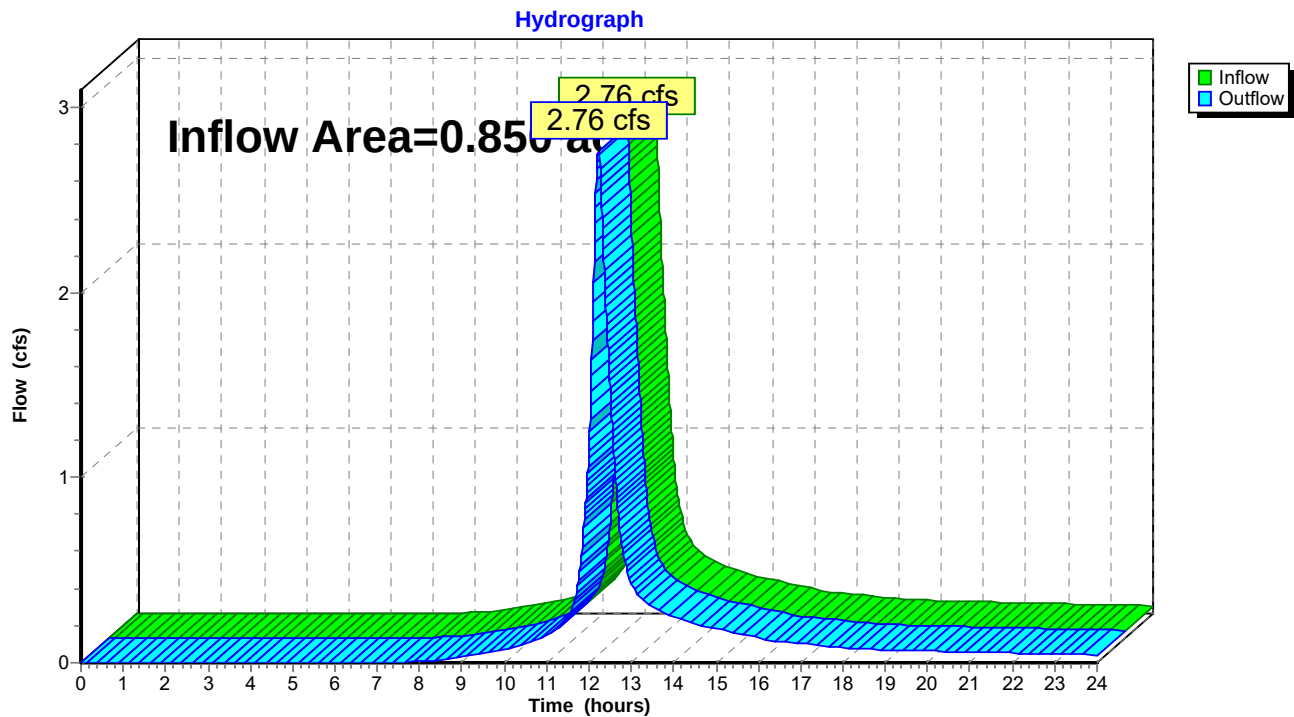
Page 19

Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.850 ac, 0.00% Impervious, Inflow Depth > 3.75" for 25-Year Storm event
Inflow = 2.76 cfs @ 12.22 hrs, Volume= 0.265 af
Outflow = 2.76 cfs @ 12.22 hrs, Volume= 0.265 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



Existing conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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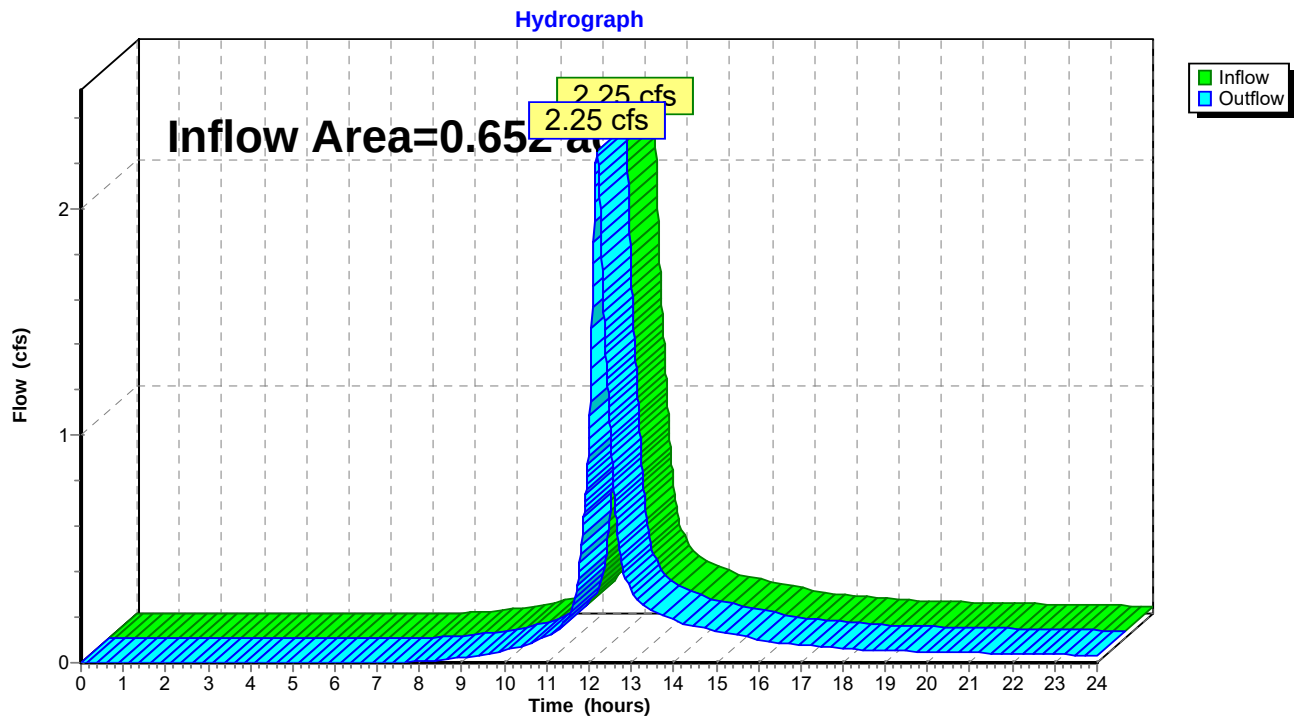
Page 20

Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 0.652 ac, 0.00% Impervious, Inflow Depth > 3.75" for 25-Year Storm event
Inflow = 2.25 cfs @ 12.19 hrs, Volume= 0.204 af
Outflow = 2.25 cfs @ 12.19 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



Existing conditions*Type III 24-hr 100-Year Storm Rainfall=8.14"*

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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

Subcatchment EWS-1: Existing Watershed 1 Runoff Area=37,006 sf 0.00% Impervious Runoff Depth>5.39"
Flow Length=207' Tc=16.0 min CN=77 Runoff=3.95 cfs 0.381 af

Subcatchment EWS-2: Existing Watershed 2 Runoff Area=28,408 sf 0.00% Impervious Runoff Depth>5.39"
Flow Length=76' Slope=0.0370 '/' Tc=13.7 min CN=77 Runoff=3.22 cfs 0.293 af

Reach DP-1: DP-1-Flow Offsite

Inflow=3.95 cfs 0.381 af

Outflow=3.95 cfs 0.381 af

Reach DP-2: DP-2-Sawin's Pond

Inflow=3.22 cfs 0.293 af

Outflow=3.22 cfs 0.293 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.674 af Average Runoff Depth = 5.39"
100.00% Pervious = 1.502 ac 0.00% Impervious = 0.000 ac

Existing conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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Summary for Subcatchment EWS-1: Existing Waterhsed 1

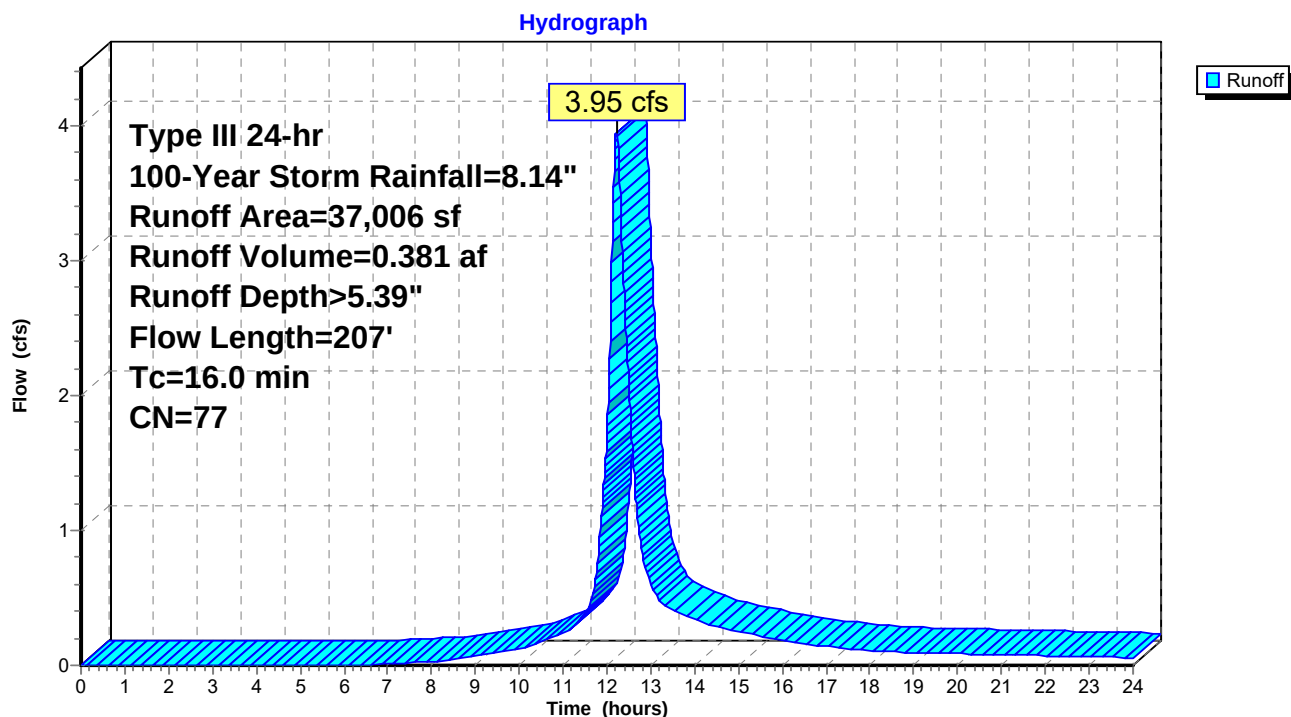
Runoff = 3.95 cfs @ 12.21 hrs, Volume= 0.381 af, Depth> 5.39"

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 Storm Rainfall=8.14"

Area (sf)	CN	Description
37,006	77	Woods, Poor, HSG C
37,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	50	0.0186	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"
3.1	157	0.0287	0.85		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.0	207	Total			

Subcatchment EWS-1: Existing Waterhsed 1



Existing conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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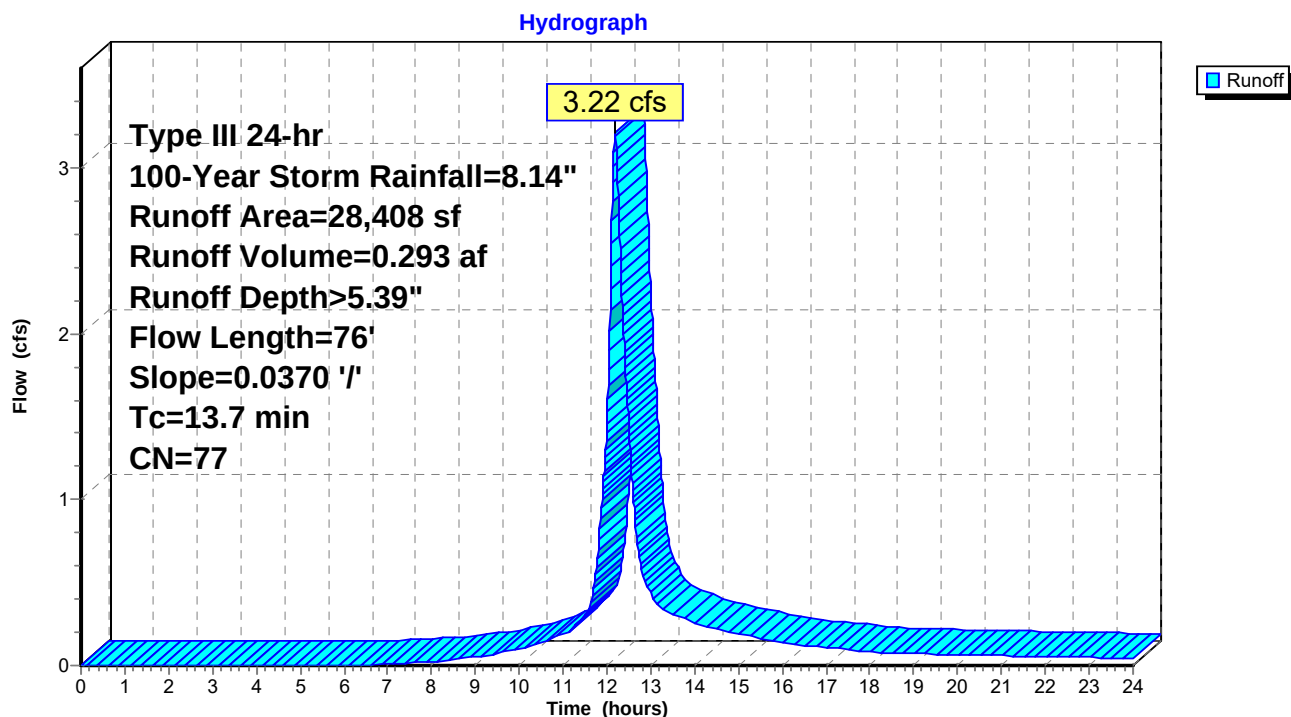
Summary for Subcatchment EWS-2: Existing Watershed 2

Runoff = 3.22 cfs @ 12.19 hrs, Volume= 0.293 af, Depth> 5.39"

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 Storm Rainfall=8.14"

Area (sf)	CN	Description
28,408	77	Woods, Poor, HSG C
28,408		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	76	0.0370	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.10"

Subcatchment EWS-2: Existing Watershed 2

Existing conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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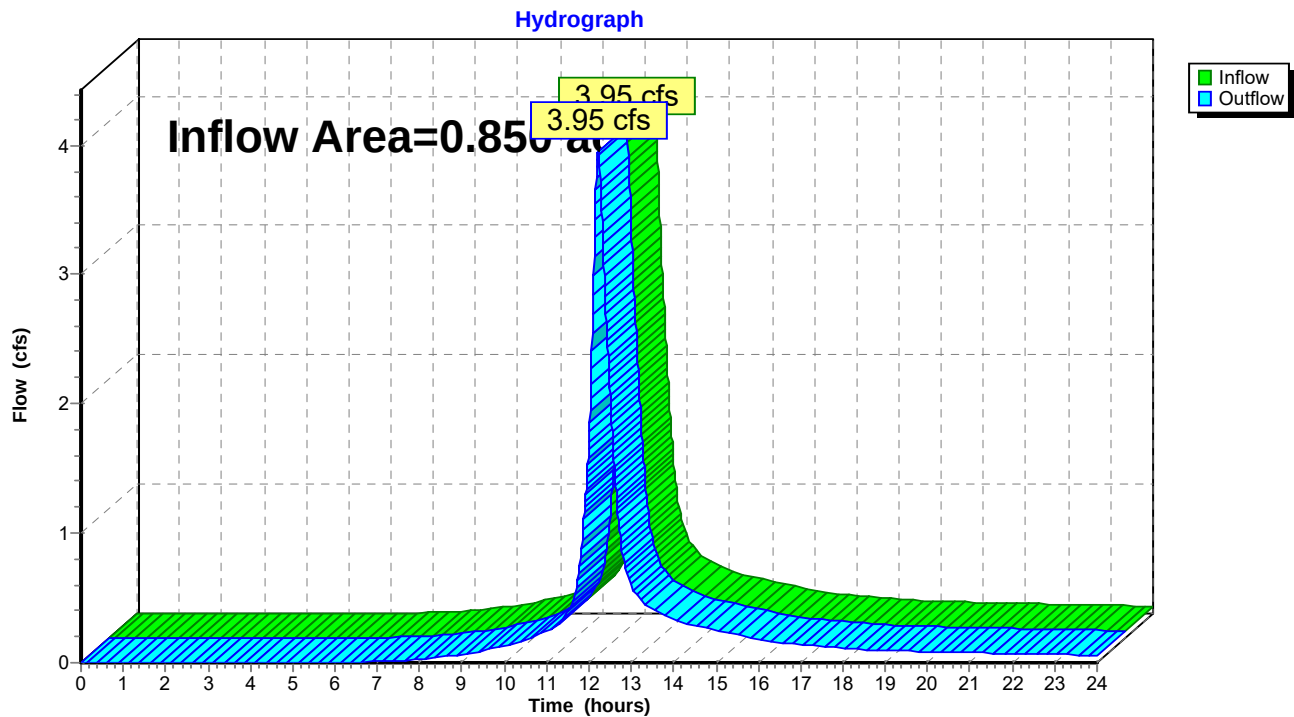
Page 24

Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.850 ac, 0.00% Impervious, Inflow Depth > 5.39" for 100-Year Storm event
Inflow = 3.95 cfs @ 12.21 hrs, Volume= 0.381 af
Outflow = 3.95 cfs @ 12.21 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



Existing conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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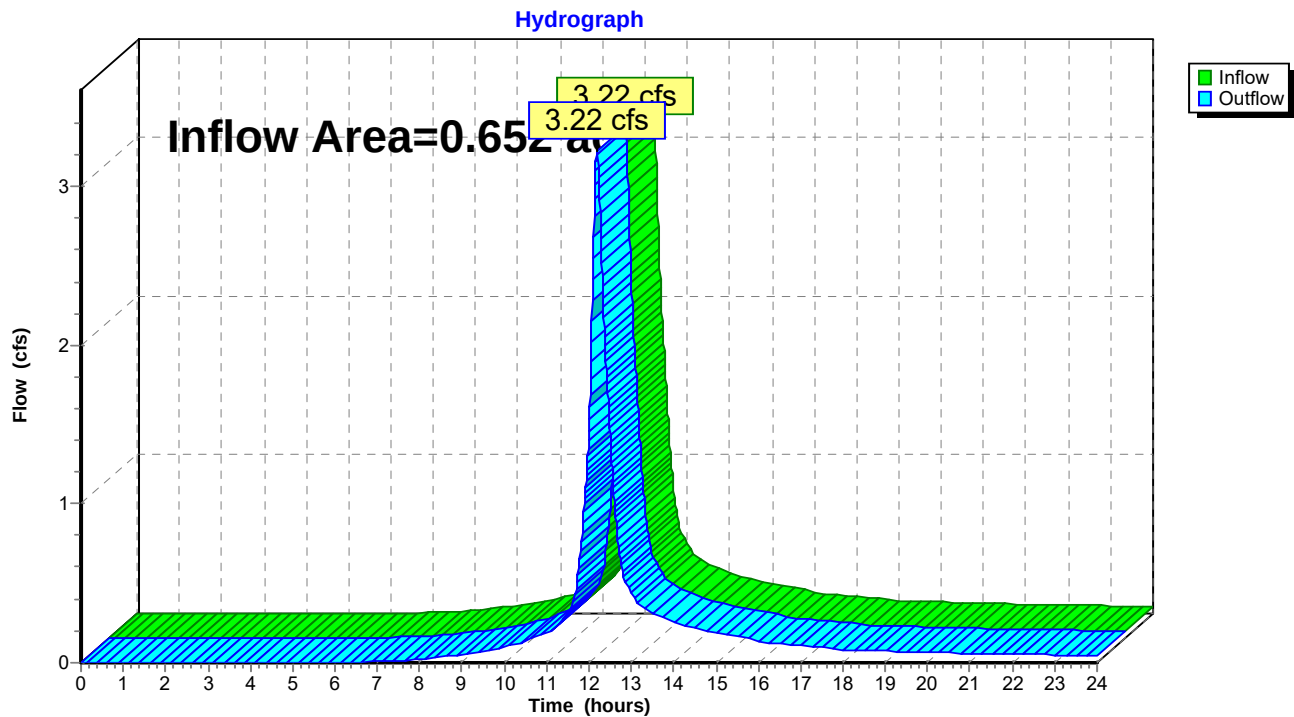
Page 25

Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 0.652 ac, 0.00% Impervious, Inflow Depth > 5.39" for 100-Year Storm event
Inflow = 3.22 cfs @ 12.19 hrs, Volume= 0.293 af
Outflow = 3.22 cfs @ 12.19 hrs, Volume= 0.293 af, Atten= 0%, Lag= 0.0 min

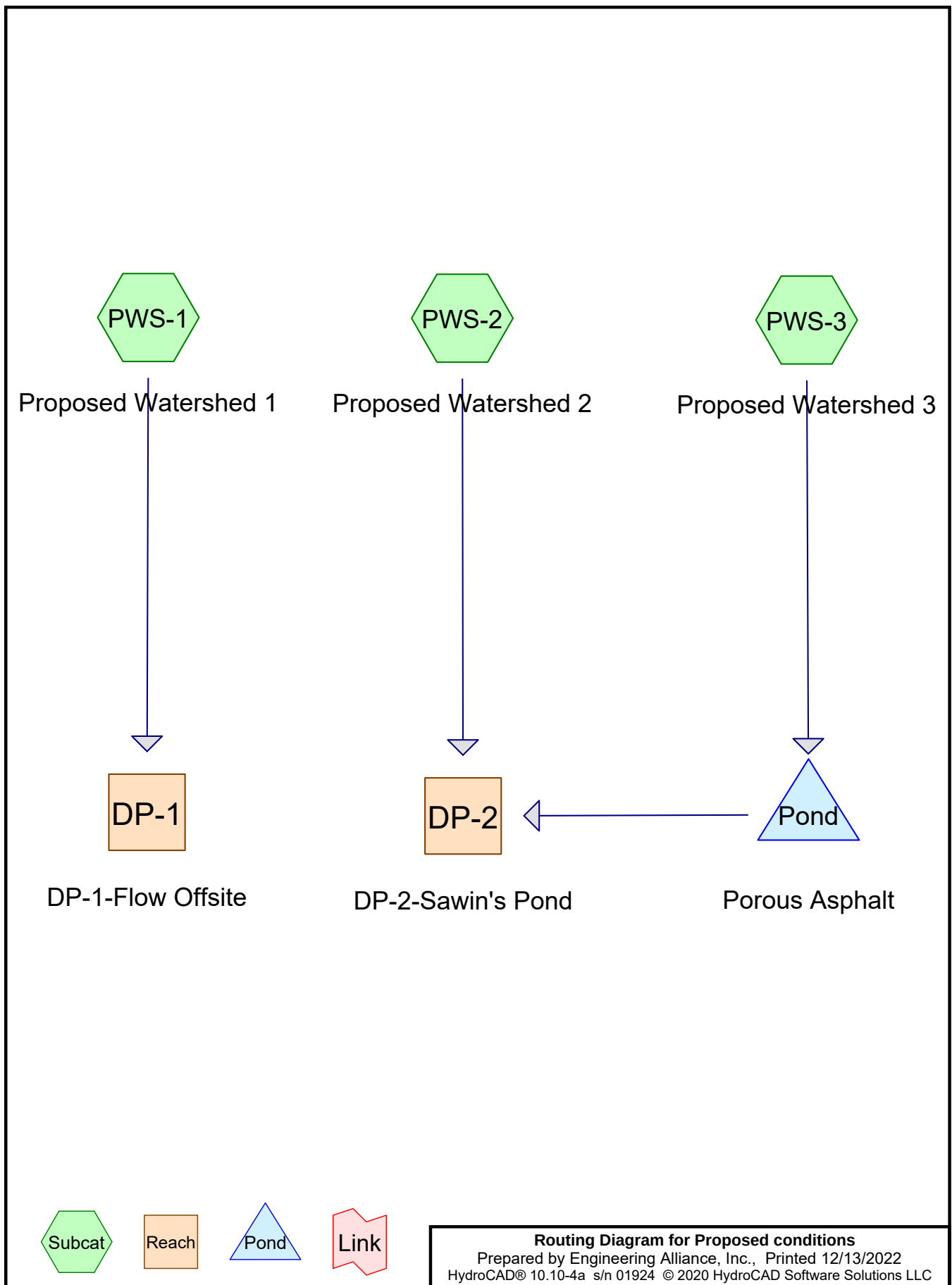
Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



APPENDIX B

**Proposed Conditions Drainage Calculations
Proposed Watershed Plan**



Proposed conditions

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year Storm	Type III 24-hr		Default	24.00	1	3.26	2
2	10-Year Storm	Type III 24-hr		Default	24.00	1	5.15	2
3	25-Year Storm	Type III 24-hr		Default	24.00	1	6.32	2
4	100-Year Storm	Type III 24-hr		Default	24.00	1	8.14	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.554	74	>75% Grass cover, Good, HSG C (PWS-1, PWS-2)
0.948	98	Porous Asphalt (PWS-3)
1.502	89	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.554	HSG C	PWS-1, PWS-2
0.000	HSG D	
0.948	Other	PWS-3
1.502		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.554	0.000	0.000	0.554	>75% Grass cover, Good	PWS-1, PWS-2
0.000	0.000	0.000	0.000	0.948	0.948	Porous Asphalt	PWS-3
0.000	0.000	0.554	0.000	0.948	1.502	TOTAL AREA	

Proposed conditions*Type III 24-hr 2-Year Storm Rainfall=3.26"*

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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

Subcatchment PWS-1: Proposed Watershed 1 Runoff Area=8,788 sf 0.00% Impervious Runoff Depth>1.08"
Tc=6.0 min CN=74 Runoff=0.24 cfs 0.018 af

Subcatchment PWS-2: Proposed Watershed Runoff Area=15,337 sf 0.00% Impervious Runoff Depth>1.07"
Flow Length=68' Tc=12.5 min CN=74 Runoff=0.34 cfs 0.032 af

Subcatchment PWS-3: Proposed Runoff Area=41,289 sf 100.00% Impervious Runoff Depth>3.02"
Tc=6.0 min CN=98 Runoff=3.00 cfs 0.239 af

Reach DP-1: DP-1-Flow Offsite Inflow=0.24 cfs 0.018 af
Outflow=0.24 cfs 0.018 af

Reach DP-2: DP-2-Sawin's Pond Inflow=0.34 cfs 0.032 af
Outflow=0.34 cfs 0.032 af

Pond Pond: Porous Asphalt Peak Elev=31.28' Storage=4,673 cf Inflow=3.00 cfs 0.239 af
Discarded=0.16 cfs 0.217 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.217 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.289 af Average Runoff Depth = 2.31"
36.88% Pervious = 0.554 ac 63.12% Impervious = 0.948 ac

Proposed conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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Summary for Subcatchment PWS-1: Proposed Watershed 1

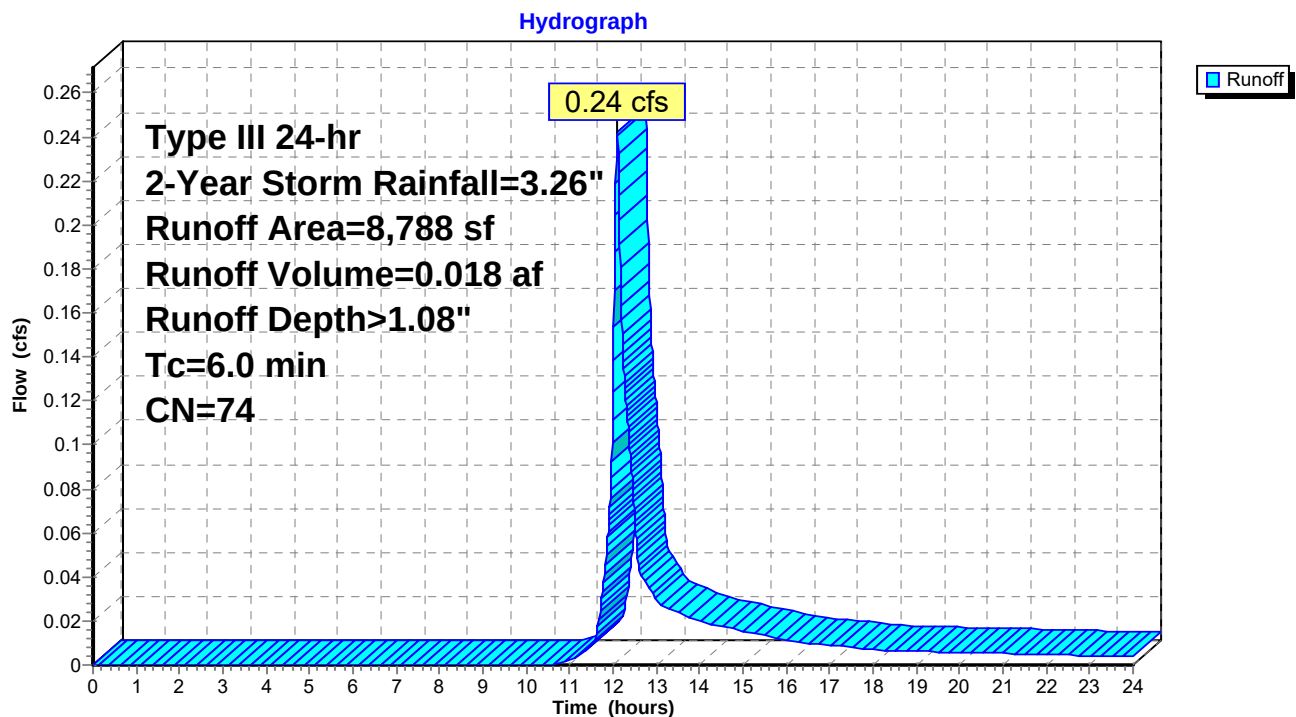
Runoff = 0.24 cfs @ 12.10 hrs, Volume= 0.018 af, Depth> 1.08"

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 Storm Rainfall=3.26"

Area (sf)	CN	Description
8,788	74	>75% Grass cover, Good, HSG C
8,788		100.00% Pervious Area

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

Subcatchment PWS-1: Proposed Watershed 1



Proposed conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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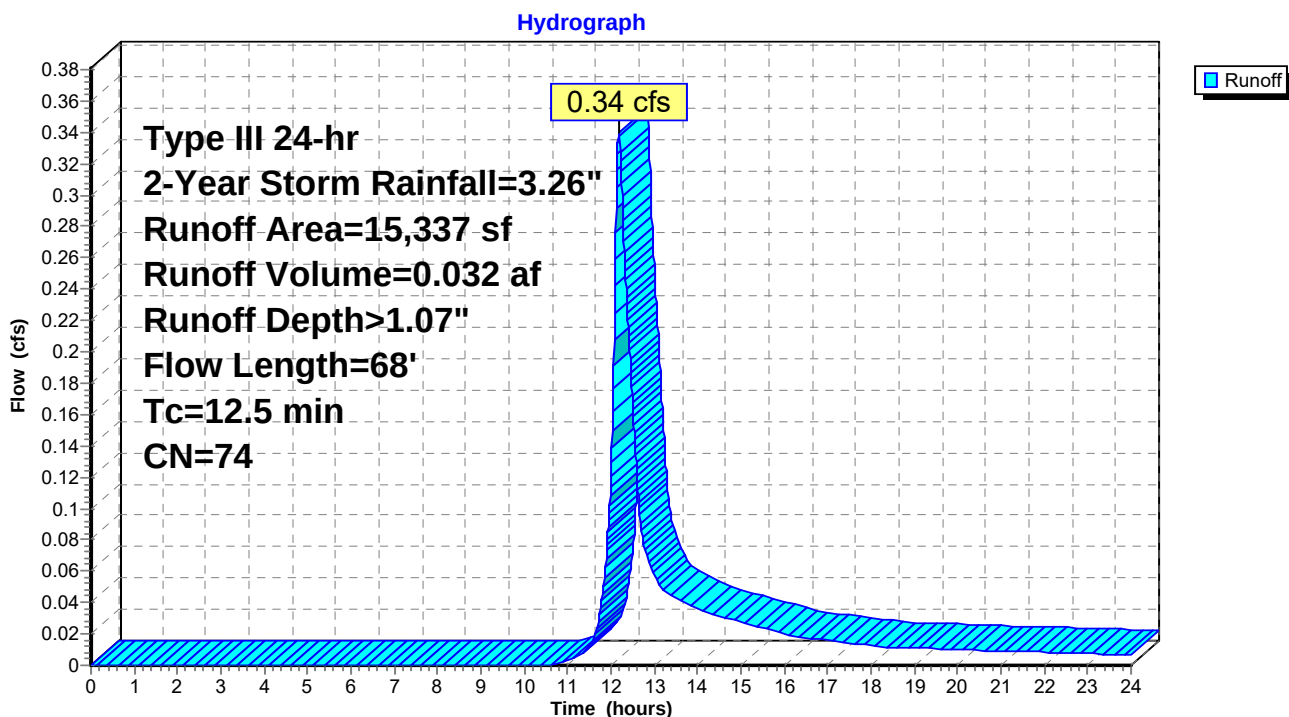
Summary for Subcatchment PWS-2: Proposed Watershed 2

Runoff = 0.34 cfs @ 12.18 hrs, Volume= 0.032 af, Depth> 1.07"

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 Storm Rainfall=3.26"

Area (sf)	CN	Description
15,337	74	>75% Grass cover, Good, HSG C
15,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	28	0.0140	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.20"
6.6	40	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
12.5	68	Total			

Subcatchment PWS-2: Proposed Watershed 2

Proposed conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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Summary for Subcatchment PWS-3: Proposed Watershed 3

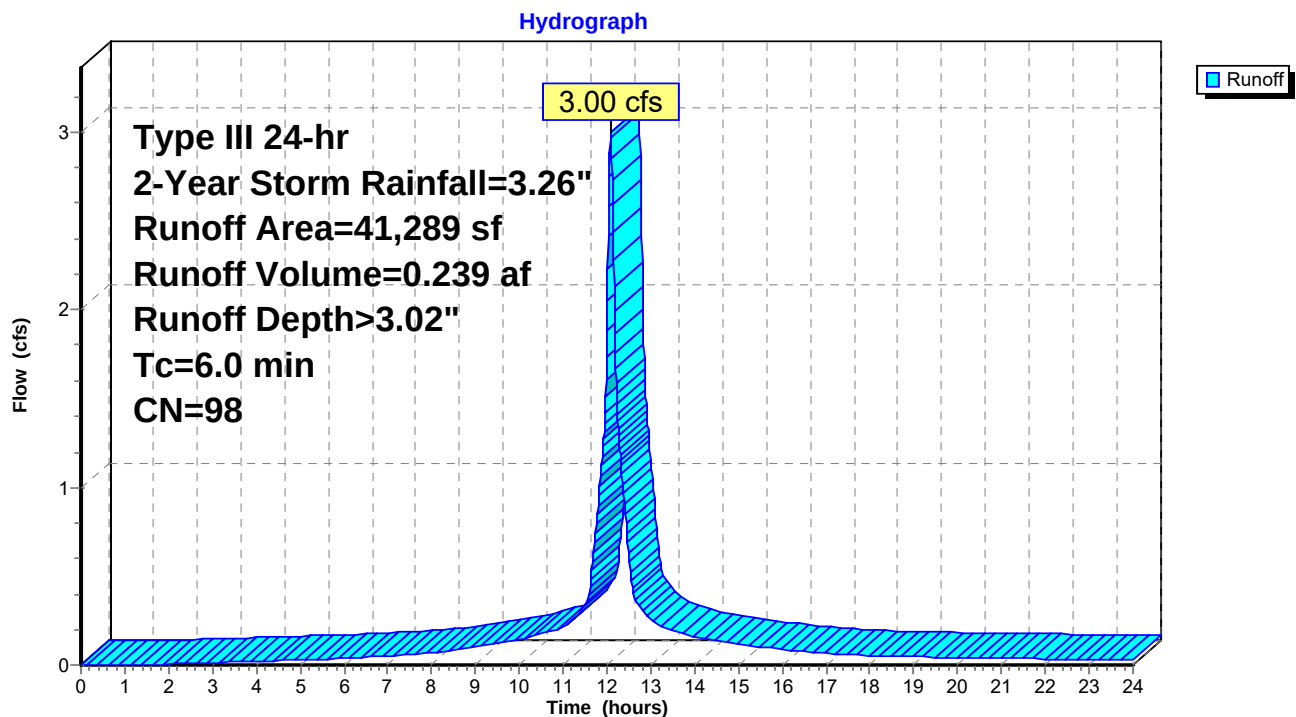
Runoff = 3.00 cfs @ 12.08 hrs, Volume= 0.239 af, Depth> 3.02"

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 Storm Rainfall=3.26"

	Area (sf)	CN	Description
*	41,289	98	Porous Asphalt
	41,289		100.00% Impervious Area

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

Subcatchment PWS-3: Proposed Watershed 3



Proposed conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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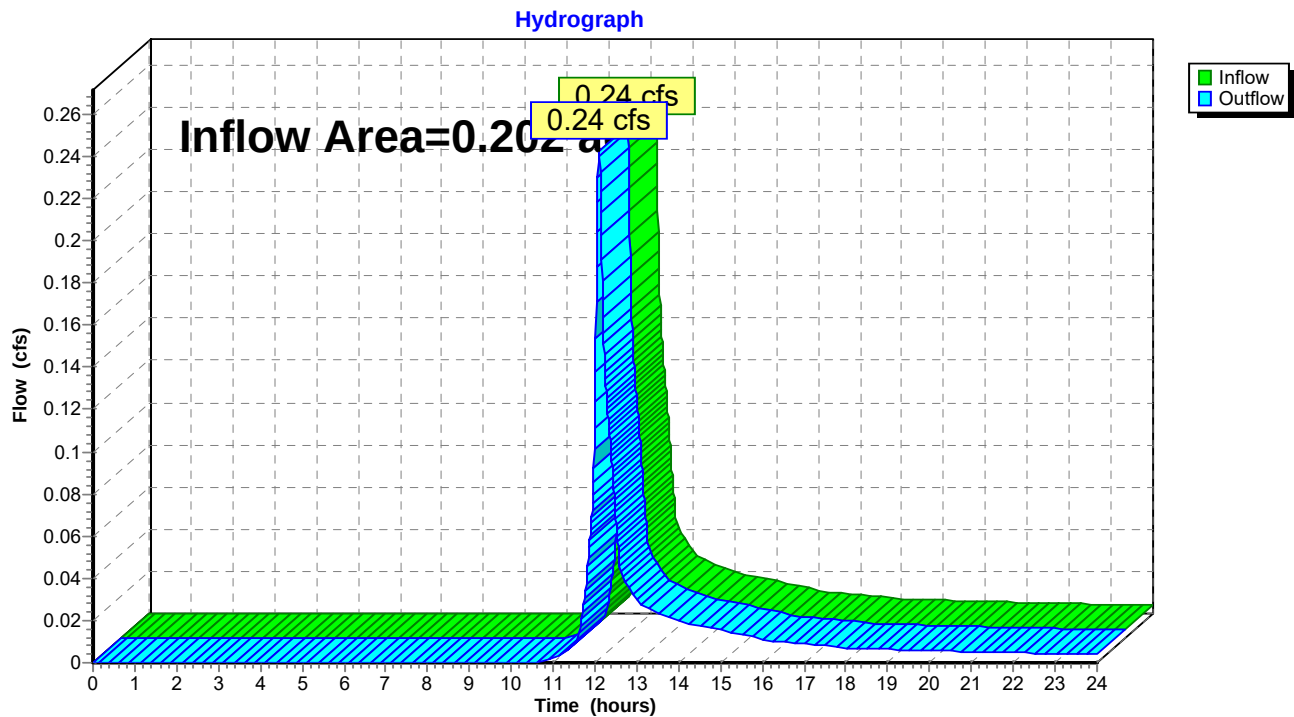
Page 10

Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.202 ac, 0.00% Impervious, Inflow Depth > 1.08" for 2-Year Storm event
Inflow = 0.24 cfs @ 12.10 hrs, Volume= 0.018 af
Outflow = 0.24 cfs @ 12.10 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



Proposed conditions

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Type III 24-hr 2-Year Storm Rainfall=3.26"

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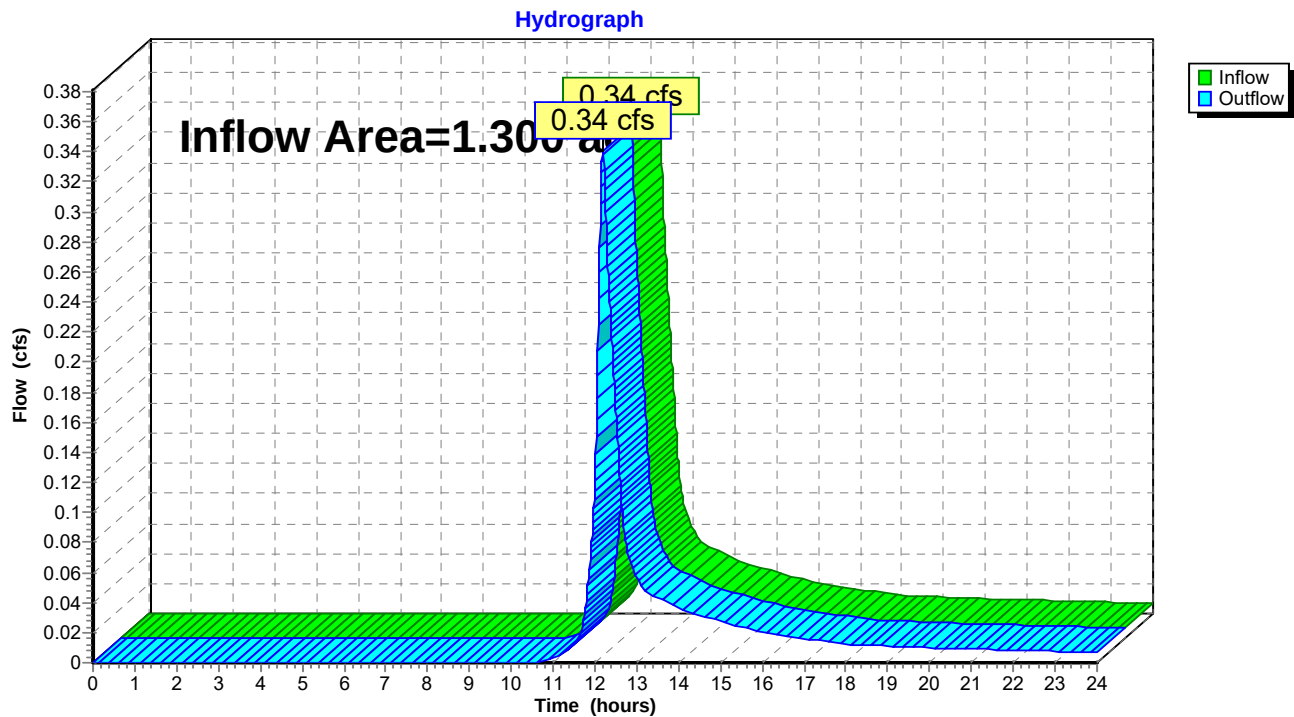
Page 11

Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 1.300 ac, 72.92% Impervious, Inflow Depth > 0.29" for 2-Year Storm event
Inflow = 0.34 cfs @ 12.18 hrs, Volume= 0.032 af
Outflow = 0.34 cfs @ 12.18 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



Proposed conditions

Type III 24-hr 2-Year Storm Rainfall=3.26"

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Summary for Pond Pond: Porous Asphalt

Inflow Area = 0.948 ac, 100.00% Impervious, Inflow Depth > 3.02" for 2-Year Storm event
 Inflow = 3.00 cfs @ 12.08 hrs, Volume= 0.239 af
 Outflow = 0.16 cfs @ 10.63 hrs, Volume= 0.217 af, Atten= 95%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 10.63 hrs, Volume= 0.217 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= 31.28' @ 13.95 hrs Surf.Area= 41,289 sf Storage= 4,673 cf

Plug-Flow detention time= 236.6 min calculated for 0.216 af (91% of inflow)
 Center-of-Mass det. time= 189.7 min (945.1 - 755.5)

Volume	Invert	Avail.Storage	Storage Description
#1	31.00'	16,516 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 41,289 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.00	41,289	0	0
32.00	41,289	41,289	41,289

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.00'	0.170 in/hr Exfiltration over Horizontal area
#2	Primary	32.00'	775.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 10.63 hrs HW=31.01' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed conditions

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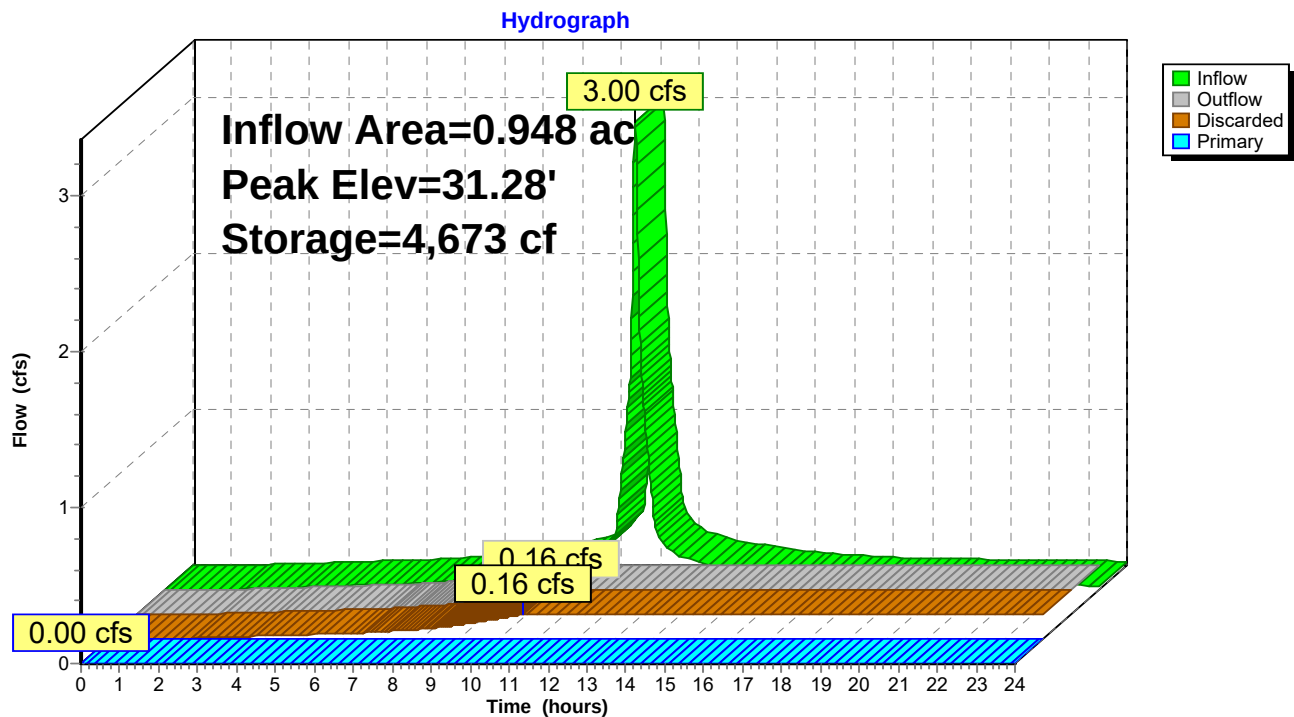
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Type III 24-hr 2-Year Storm Rainfall=3.26"

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Pond Pond: Porous Asphalt



Proposed conditions*Type III 24-hr 10-Year Storm Rainfall=5.15"*

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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

Subcatchment PWS-1: Proposed Watershed 1 Runoff Area=8,788 sf 0.00% Impervious Runoff Depth>2.48"
Tc=6.0 min CN=74 Runoff=0.59 cfs 0.042 af

Subcatchment PWS-2: Proposed Watershed Runoff Area=15,337 sf 0.00% Impervious Runoff Depth>2.48"
Flow Length=68' Tc=12.5 min CN=74 Runoff=0.83 cfs 0.073 af

Subcatchment PWS-3: Proposed Runoff Area=41,289 sf 100.00% Impervious Runoff Depth>4.91"
Tc=6.0 min CN=98 Runoff=4.78 cfs 0.388 af

Reach DP-1: DP-1-Flow Offsite Inflow=0.59 cfs 0.042 af
Outflow=0.59 cfs 0.042 af

Reach DP-2: DP-2-Sawin's Pond Inflow=0.83 cfs 0.073 af
Outflow=0.83 cfs 0.073 af

Pond Pond: Porous Asphalt Peak Elev=31.55' Storage=9,097 cf Inflow=4.78 cfs 0.388 af
Discarded=0.16 cfs 0.240 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.240 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.502 af Average Runoff Depth = 4.01"
36.88% Pervious = 0.554 ac 63.12% Impervious = 0.948 ac

Proposed conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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Summary for Subcatchment PWS-1: Proposed Watershed 1

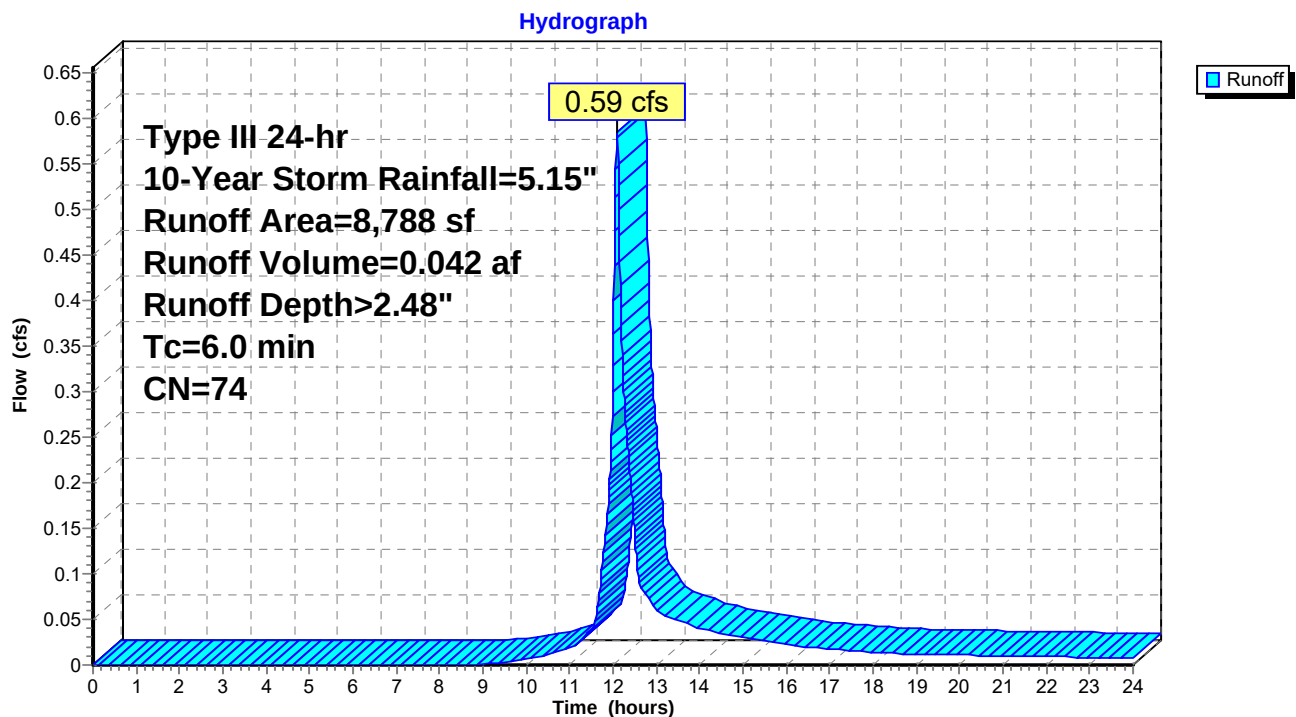
Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.042 af, Depth> 2.48"

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 Storm Rainfall=5.15"

Area (sf)	CN	Description
8,788	74	>75% Grass cover, Good, HSG C
8,788		100.00% Pervious Area

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

Subcatchment PWS-1: Proposed Watershed 1



Proposed conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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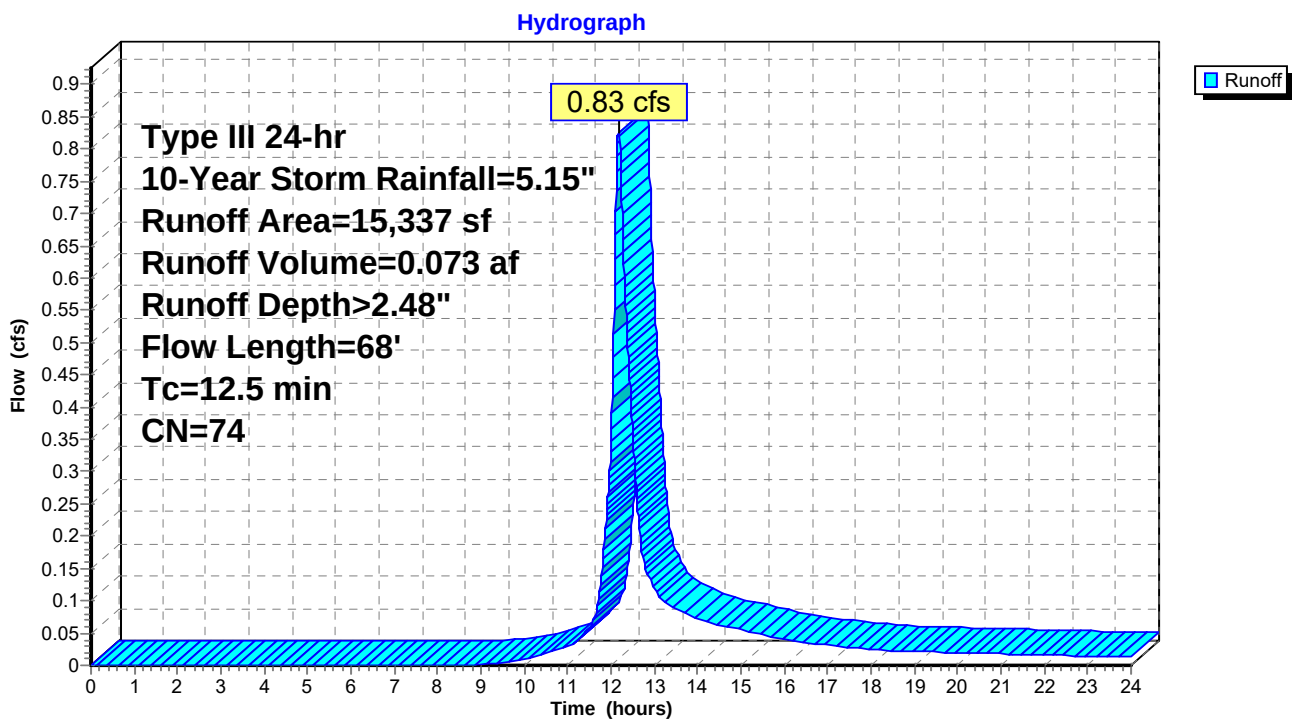
Summary for Subcatchment PWS-2: Proposed Watershed 2

Runoff = 0.83 cfs @ 12.18 hrs, Volume= 0.073 af, Depth> 2.48"

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 Storm Rainfall=5.15"

Area (sf)	CN	Description
15,337	74	>75% Grass cover, Good, HSG C
15,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	28	0.0140	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.20"
6.6	40	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
12.5	68	Total			

Subcatchment PWS-2: Proposed Watershed 2

Proposed conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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Summary for Subcatchment PWS-3: Proposed Watershed 3

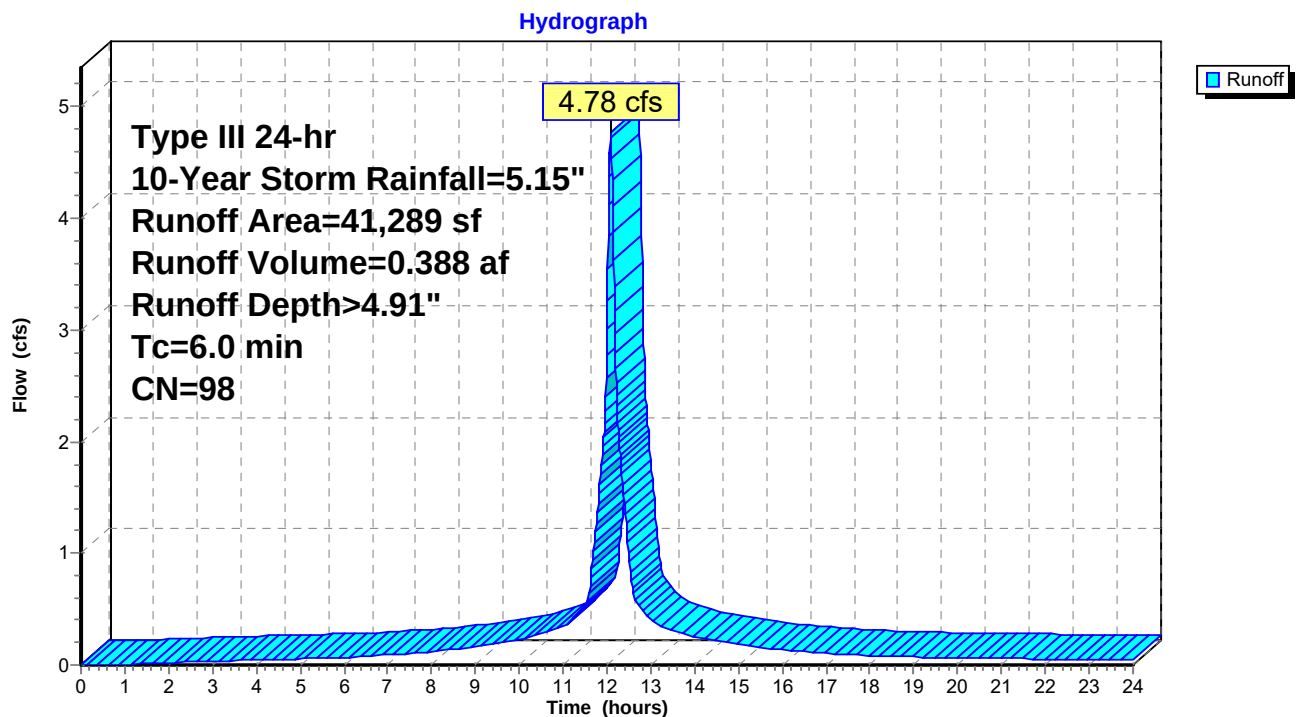
Runoff = 4.78 cfs @ 12.08 hrs, Volume= 0.388 af, Depth> 4.91"

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 Storm Rainfall=5.15"

	Area (sf)	CN	Description
*	41,289	98	Porous Asphalt
	41,289		100.00% Impervious Area

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

Subcatchment PWS-3: Proposed Watershed 3



Proposed conditions

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Type III 24-hr 10-Year Storm Rainfall=5.15"

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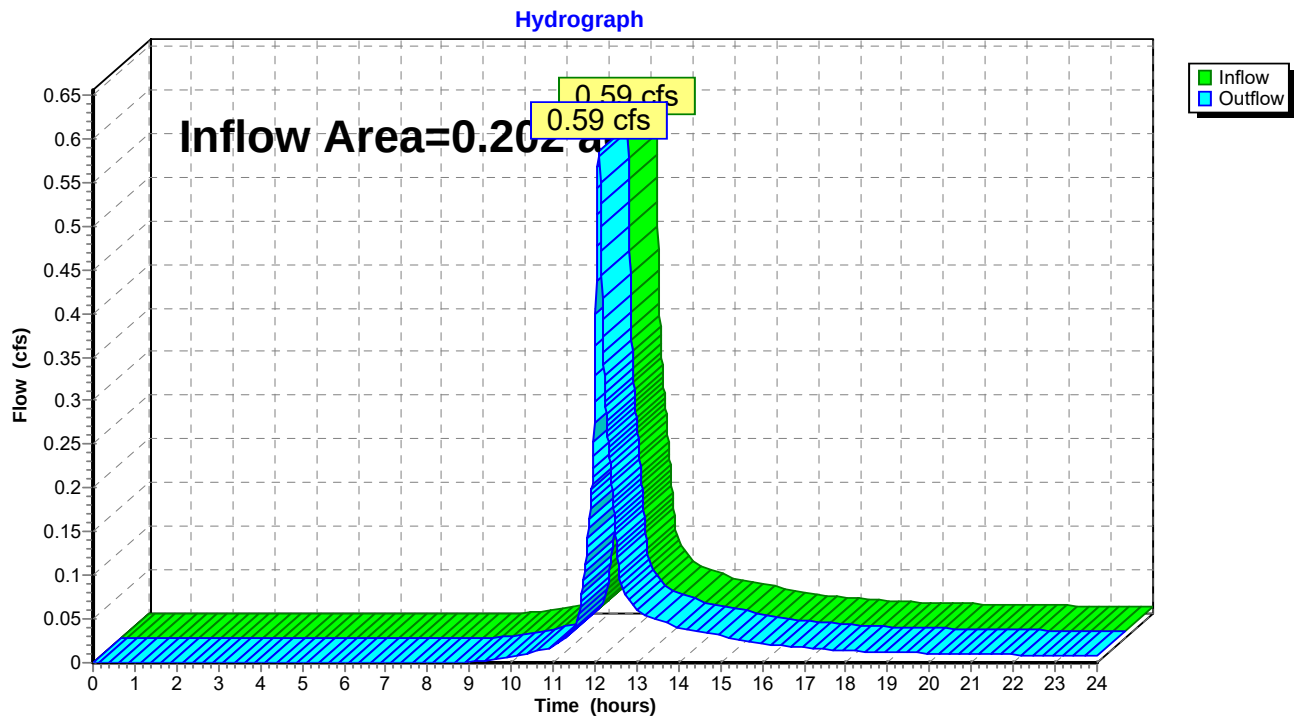
Page 18

Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.202 ac, 0.00% Impervious, Inflow Depth > 2.48" for 10-Year Storm event
Inflow = 0.59 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.59 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



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Type III 24-hr 10-Year Storm Rainfall=5.15"

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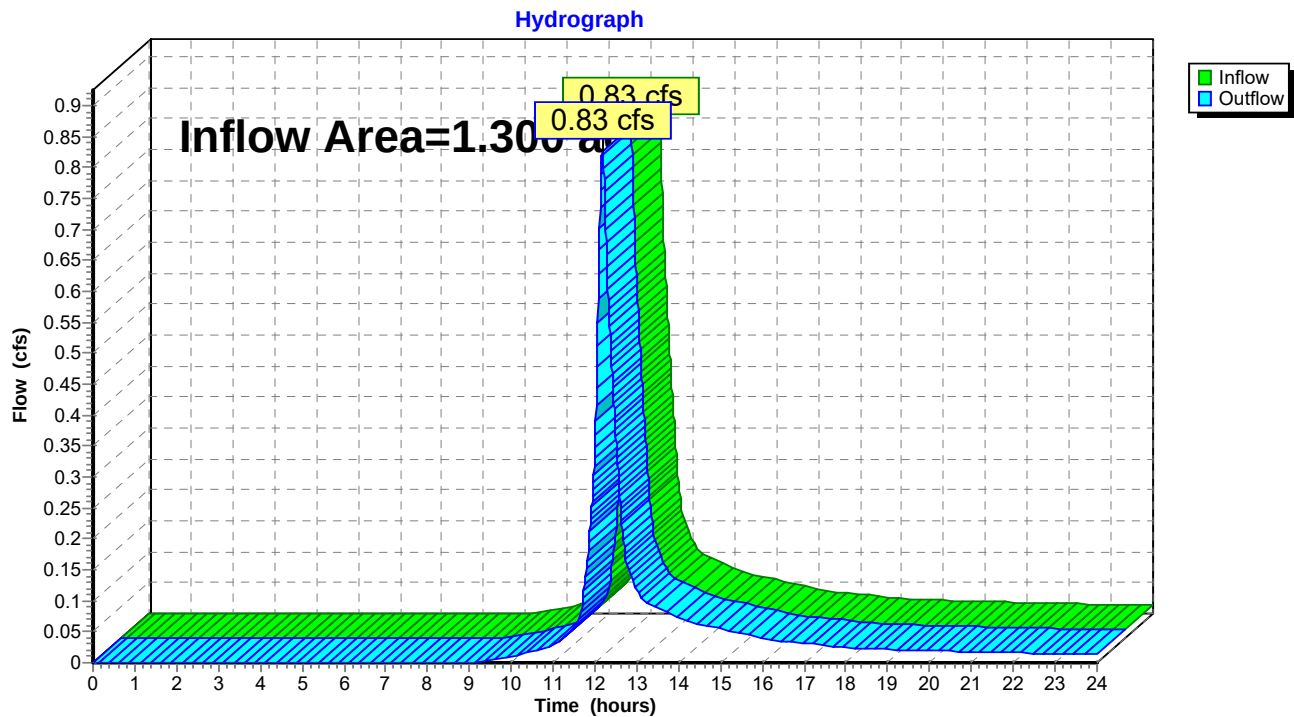
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Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 1.300 ac, 72.92% Impervious, Inflow Depth > 0.67" for 10-Year Storm event
Inflow = 0.83 cfs @ 12.18 hrs, Volume= 0.073 af
Outflow = 0.83 cfs @ 12.18 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



Proposed conditions

Type III 24-hr 10-Year Storm Rainfall=5.15"

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Summary for Pond Pond: Porous Asphalt

Inflow Area = 0.948 ac, 100.00% Impervious, Inflow Depth > 4.91" for 10-Year Storm event
 Inflow = 4.78 cfs @ 12.08 hrs, Volume= 0.388 af
 Outflow = 0.16 cfs @ 9.15 hrs, Volume= 0.240 af, Atten= 97%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 9.15 hrs, Volume= 0.240 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= 31.55' @ 15.48 hrs Surf.Area= 41,289 sf Storage= 9,097 cf

Plug-Flow detention time= 253.5 min calculated for 0.240 af (62% of inflow)
 Center-of-Mass det. time= 146.3 min (893.3 - 747.0)

Volume	Invert	Avail.Storage	Storage Description
#1	31.00'	16,516 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 41,289 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.00	41,289	0	0
32.00	41,289	41,289	41,289

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.00'	0.170 in/hr Exfiltration over Horizontal area
#2	Primary	32.00'	775.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 9.15 hrs HW=31.01' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed conditions

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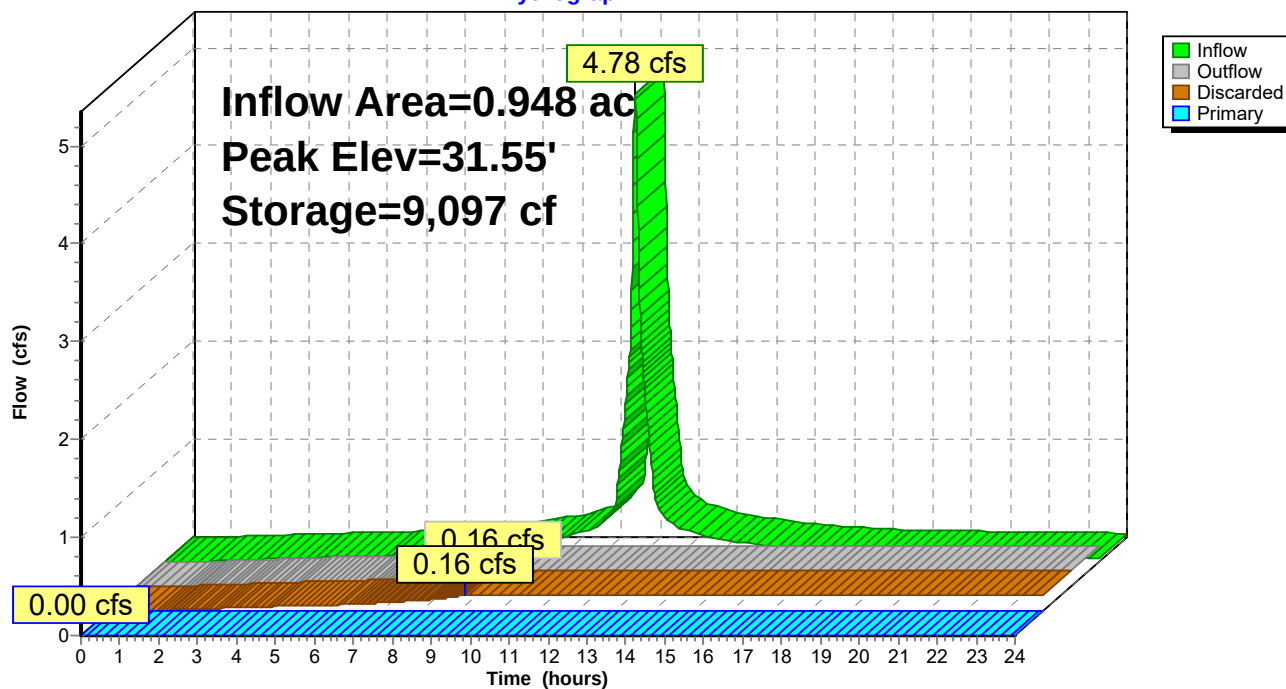
Type III 24-hr 10-Year Storm Rainfall=5.15"

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Pond Pond: Porous Asphalt

Hydrograph



Proposed conditions*Type III 24-hr 25-Year Storm Rainfall=6.32"*

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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

Subcatchment PWS-1: Proposed Watershed 1 Runoff Area=8,788 sf 0.00% Impervious Runoff Depth>3.45"
Tc=6.0 min CN=74 Runoff=0.82 cfs 0.058 af

Subcatchment PWS-2: Proposed Watershed Runoff Area=15,337 sf 0.00% Impervious Runoff Depth>3.45"
Flow Length=68' Tc=12.5 min CN=74 Runoff=1.16 cfs 0.101 af

Subcatchment PWS-3: Proposed Runoff Area=41,289 sf 100.00% Impervious Runoff Depth>6.08"
Tc=6.0 min CN=98 Runoff=5.87 cfs 0.480 af

Reach DP-1: DP-1-Flow Offsite Inflow=0.82 cfs 0.058 af
Outflow=0.82 cfs 0.058 af

Reach DP-2: DP-2-Sawin's Pond Inflow=1.16 cfs 0.101 af
Outflow=1.16 cfs 0.101 af

Pond Pond: Porous Asphalt Peak Elev=31.73' Storage=12,133 cf Inflow=5.87 cfs 0.480 af
Discarded=0.16 cfs 0.251 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.251 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.639 af Average Runoff Depth = 5.11"
36.88% Pervious = 0.554 ac 63.12% Impervious = 0.948 ac

Proposed conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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Summary for Subcatchment PWS-1: Proposed Watershed 1

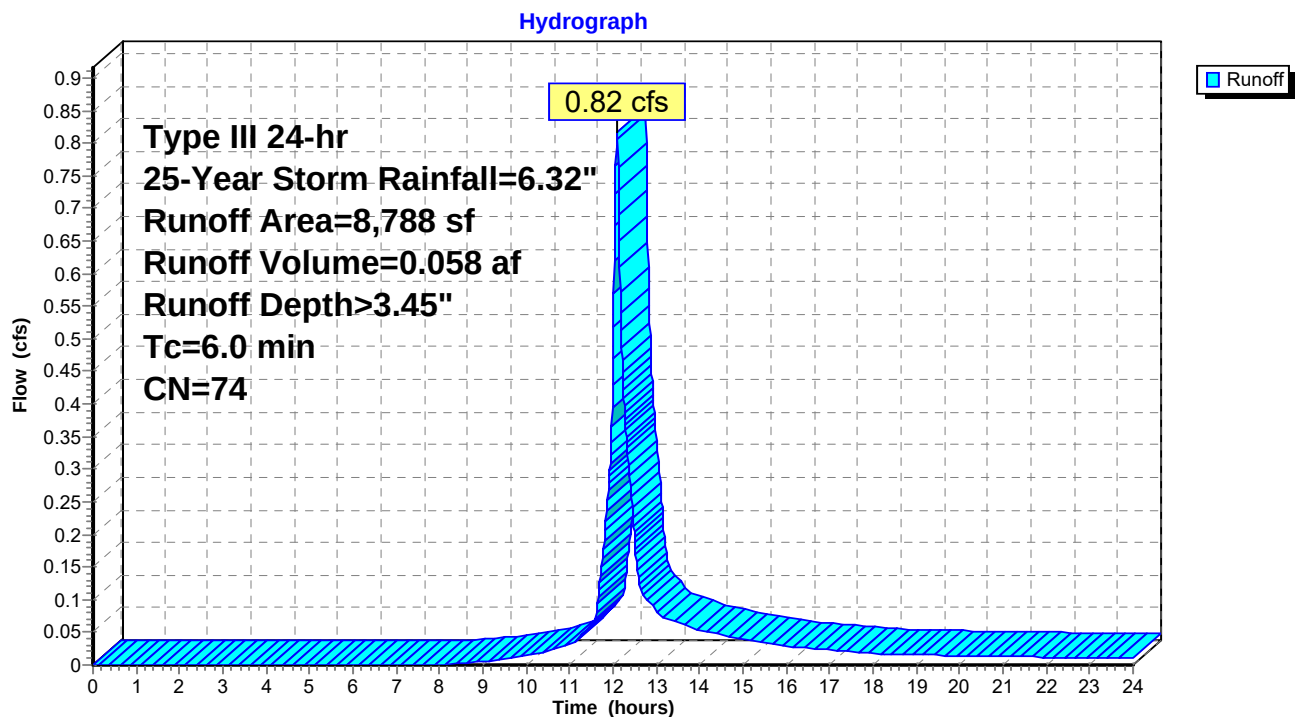
Runoff = 0.82 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 3.45"

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 25-Year Storm Rainfall=6.32"

Area (sf)	CN	Description
8,788	74	>75% Grass cover, Good, HSG C
8,788		100.00% Pervious Area

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

Subcatchment PWS-1: Proposed Watershed 1



Proposed conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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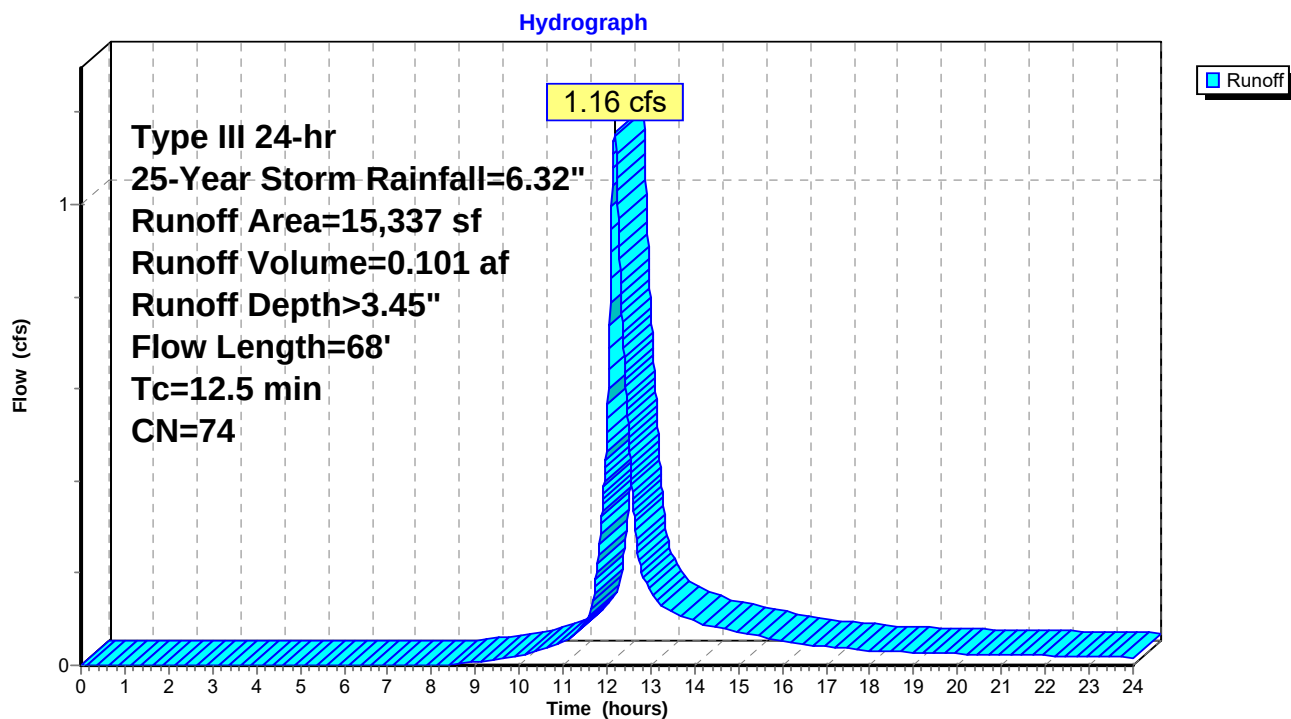
Summary for Subcatchment PWS-2: Proposed Watershed 2

Runoff = 1.16 cfs @ 12.18 hrs, Volume= 0.101 af, Depth> 3.45"

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 25-Year Storm Rainfall=6.32"

Area (sf)	CN	Description
15,337	74	>75% Grass cover, Good, HSG C
15,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	28	0.0140	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.20"
6.6	40	0.0600	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
12.5	68	Total			

Subcatchment PWS-2: Proposed Watershed 2

Proposed conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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Summary for Subcatchment PWS-3: Proposed Watershed 3

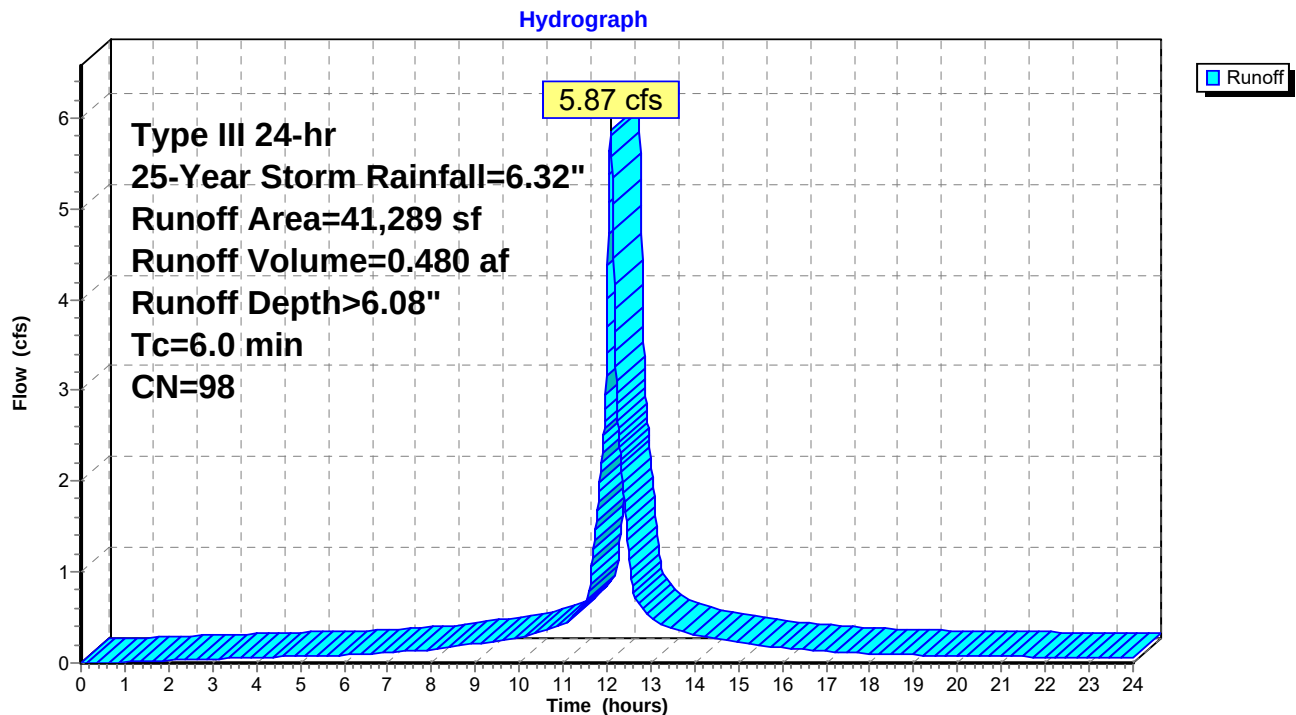
Runoff = 5.87 cfs @ 12.08 hrs, Volume= 0.480 af, Depth> 6.08"

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 25-Year Storm Rainfall=6.32"

	Area (sf)	CN	Description
*	41,289	98	Porous Asphalt
	41,289		100.00% Impervious Area

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

Subcatchment PWS-3: Proposed Watershed 3



Proposed conditions

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Type III 24-hr 25-Year Storm Rainfall=6.32"

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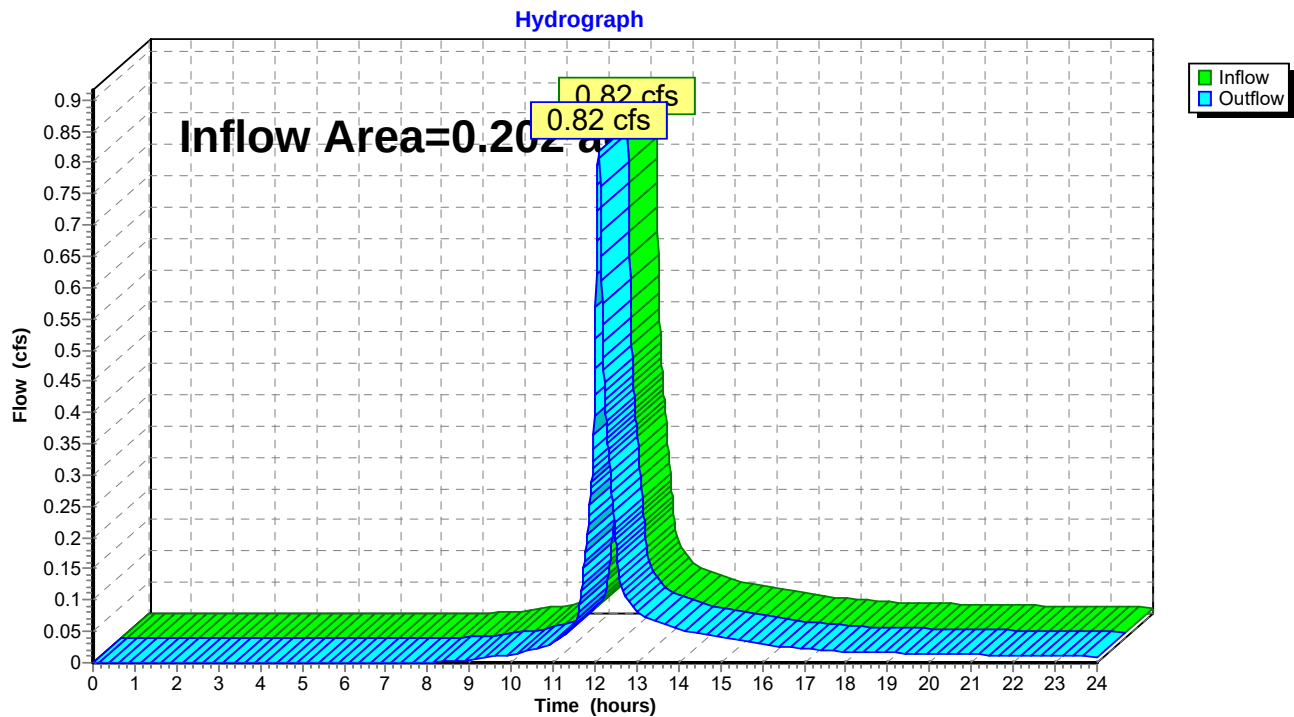
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Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.202 ac, 0.00% Impervious, Inflow Depth > 3.45" for 25-Year Storm event
Inflow = 0.82 cfs @ 12.09 hrs, Volume= 0.058 af
Outflow = 0.82 cfs @ 12.09 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



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Type III 24-hr 25-Year Storm Rainfall=6.32"

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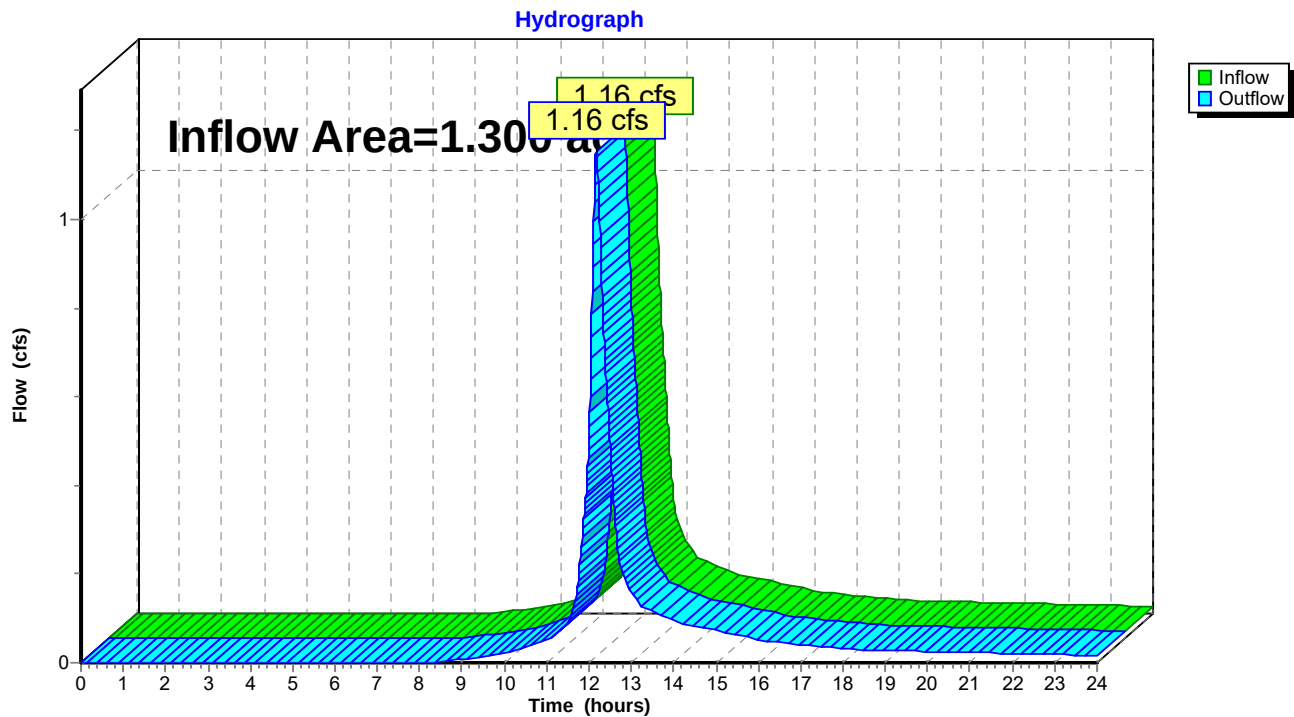
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Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 1.300 ac, 72.92% Impervious, Inflow Depth > 0.93" for 25-Year Storm event
Inflow = 1.16 cfs @ 12.18 hrs, Volume= 0.101 af
Outflow = 1.16 cfs @ 12.18 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



Proposed conditions

Type III 24-hr 25-Year Storm Rainfall=6.32"

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Summary for Pond Pond: Porous Asphalt

Inflow Area = 0.948 ac, 100.00% Impervious, Inflow Depth > 6.08" for 25-Year Storm event
 Inflow = 5.87 cfs @ 12.08 hrs, Volume= 0.480 af
 Outflow = 0.16 cfs @ 8.55 hrs, Volume= 0.251 af, Atten= 97%, Lag= 0.0 min
 Discarded = 0.16 cfs @ 8.55 hrs, Volume= 0.251 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= 31.73' @ 16.01 hrs Surf.Area= 41,289 sf Storage= 12,133 cf

Plug-Flow detention time= 251.4 min calculated for 0.251 af (52% of inflow)
 Center-of-Mass det. time= 125.4 min (869.2 - 743.8)

Volume	Invert	Avail.Storage	Storage Description
#1	31.00'	16,516 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 41,289 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.00	41,289	0	0
32.00	41,289	41,289	41,289

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.00'	0.170 in/hr Exfiltration over Horizontal area
#2	Primary	32.00'	775.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 8.55 hrs HW=31.01' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed conditions

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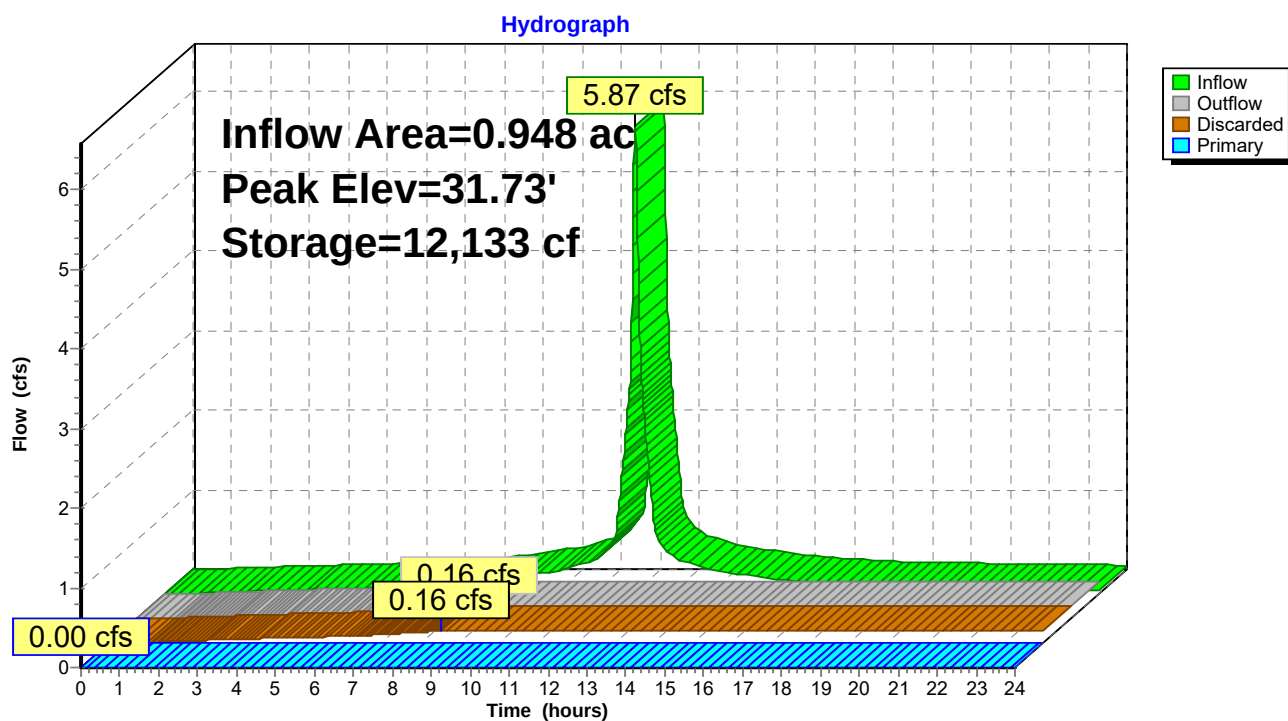
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Type III 24-hr 25-Year Storm Rainfall=6.32"

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Pond Pond: Porous Asphalt



Proposed conditions*Type III 24-hr 100-Year Storm Rainfall=8.14"*

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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

Subcatchment PWS-1: Proposed Watershed 1 Runoff Area=8,788 sf 0.00% Impervious Runoff Depth>5.05"
Tc=6.0 min CN=74 Runoff=1.19 cfs 0.085 af

Subcatchment PWS-2: Proposed Watershed Runoff Area=15,337 sf 0.00% Impervious Runoff Depth>5.04"
Flow Length=68' Tc=12.5 min CN=74 Runoff=1.68 cfs 0.148 af

Subcatchment PWS-3: Proposed Runoff Area=41,289 sf 100.00% Impervious Runoff Depth>7.89"
Tc=6.0 min CN=98 Runoff=7.58 cfs 0.624 af

Reach DP-1: DP-1-Flow Offsite Inflow=1.19 cfs 0.085 af
Outflow=1.19 cfs 0.085 af

Reach DP-2: DP-2-Sawin's Pond Inflow=1.68 cfs 0.152 af
Outflow=1.68 cfs 0.152 af

Pond Pond: Porous Asphalt Peak Elev=32.00' Storage=16,516 cf Inflow=7.58 cfs 0.624 af
Discarded=0.16 cfs 0.266 af Primary=0.09 cfs 0.004 af Outflow=0.26 cfs 0.270 af

Total Runoff Area = 1.502 ac Runoff Volume = 0.856 af Average Runoff Depth = 6.84"
36.88% Pervious = 0.554 ac 63.12% Impervious = 0.948 ac

Proposed conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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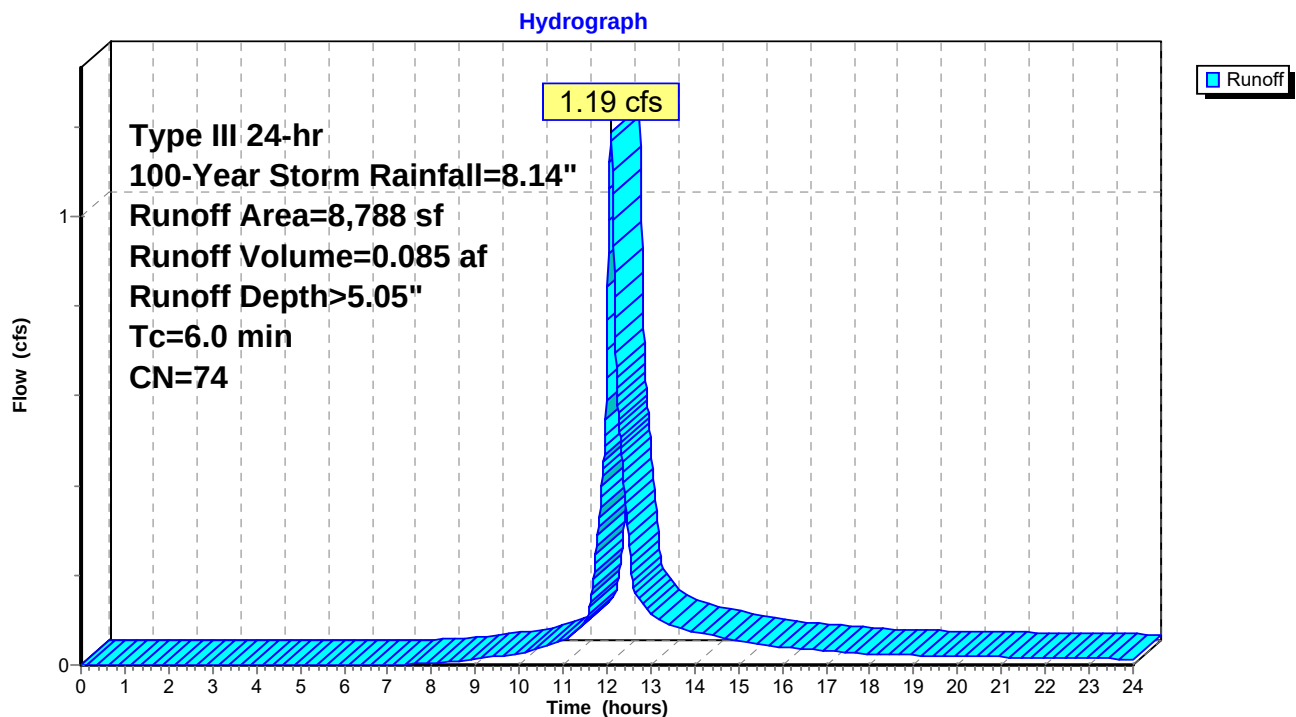
Summary for Subcatchment PWS-1: Proposed Watershed 1

Runoff = 1.19 cfs @ 12.09 hrs, Volume= 0.085 af, Depth> 5.05"

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 100-Year Storm Rainfall=8.14"

Area (sf)	CN	Description
8,788	74	>75% Grass cover, Good, HSG C
8,788		100.00% Pervious Area

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

Subcatchment PWS-1: Proposed Watershed 1

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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Summary for Subcatchment PWS-2: Proposed Watershed 2

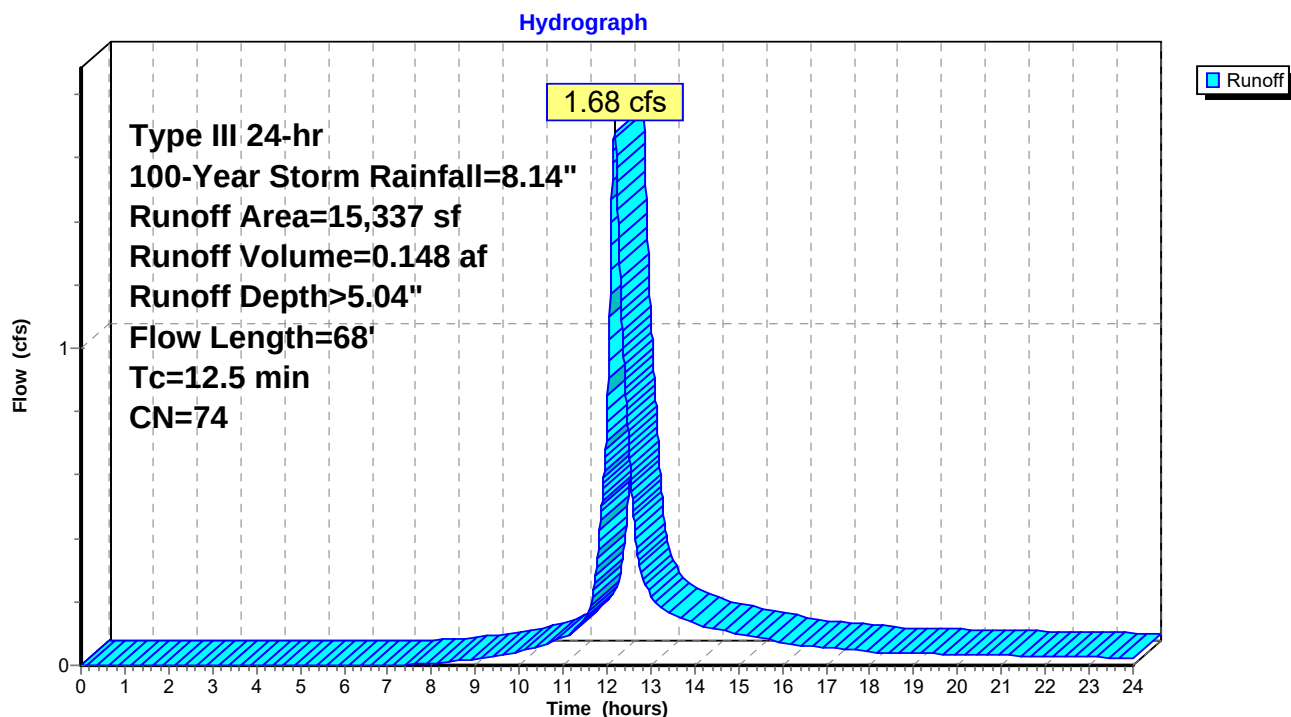
Runoff = 1.68 cfs @ 12.17 hrs, Volume= 0.148 af, Depth> 5.04"

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 Storm Rainfall=8.14"

Area (sf)	CN	Description
15,337	74	>75% Grass cover, Good, HSG C
15,337		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	28	0.0140	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.20" Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
6.6	40	0.0600	0.10		
12.5	68	Total			

Subcatchment PWS-2: Proposed Watershed 2



Proposed conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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Summary for Subcatchment PWS-3: Proposed Watershed 3

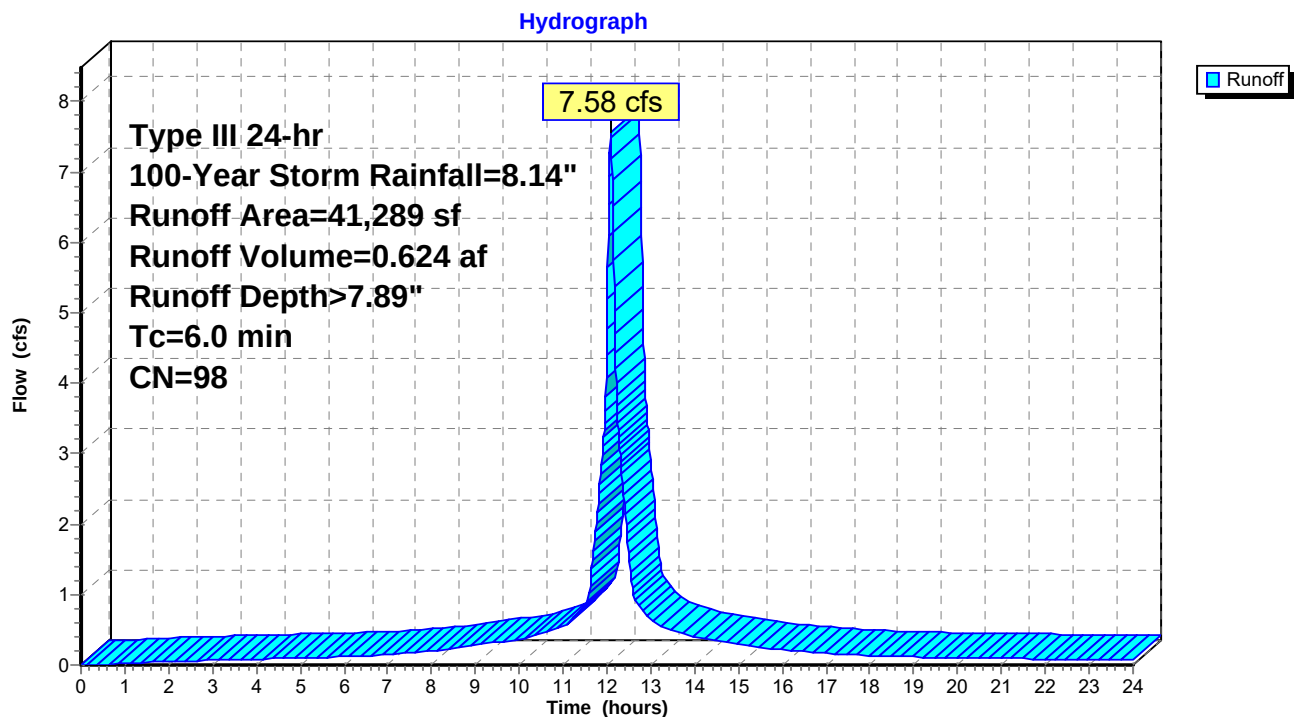
Runoff = 7.58 cfs @ 12.08 hrs, Volume= 0.624 af, Depth> 7.89"

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 Storm Rainfall=8.14"

	Area (sf)	CN	Description
*	41,289	98	Porous Asphalt
	41,289		100.00% Impervious Area

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

Subcatchment PWS-3: Proposed Watershed 3



Proposed conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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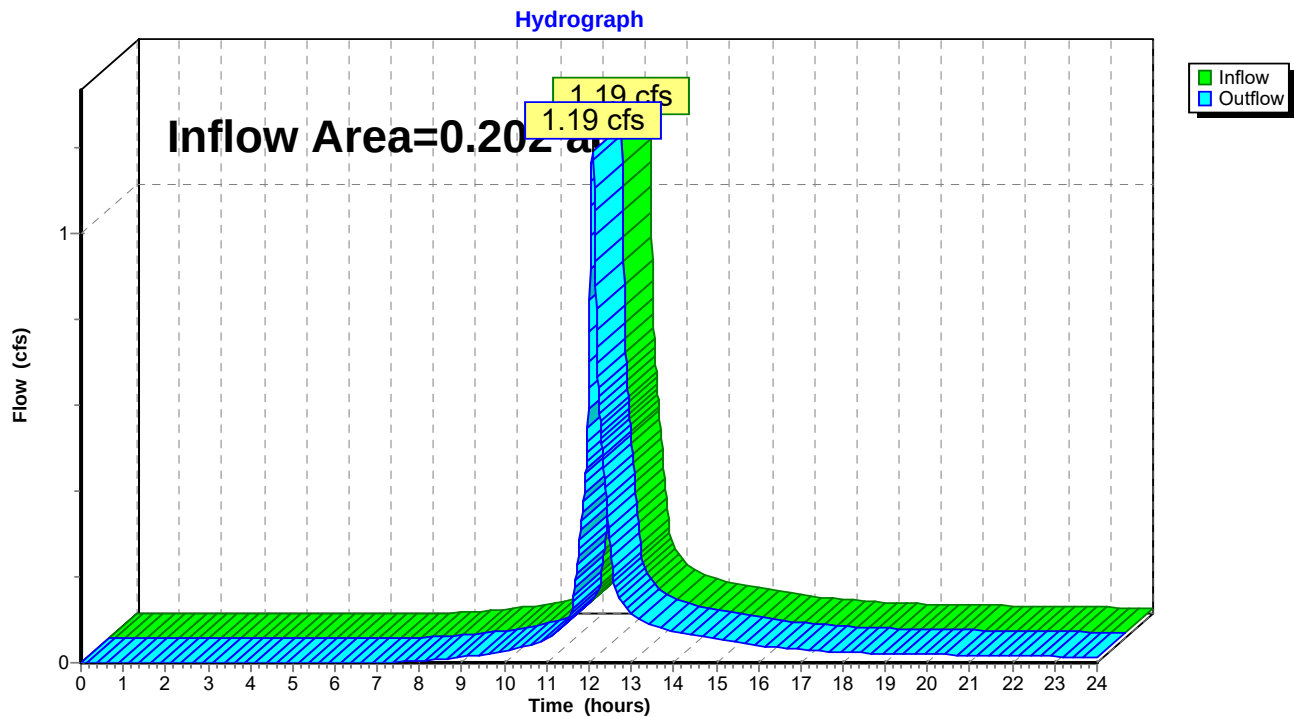
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Summary for Reach DP-1: DP-1-Flow Offsite

Inflow Area = 0.202 ac, 0.00% Impervious, Inflow Depth > 5.05" for 100-Year Storm event
Inflow = 1.19 cfs @ 12.09 hrs, Volume= 0.085 af
Outflow = 1.19 cfs @ 12.09 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1-Flow Offsite



Proposed conditions

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Type III 24-hr 100-Year Storm Rainfall=8.14"

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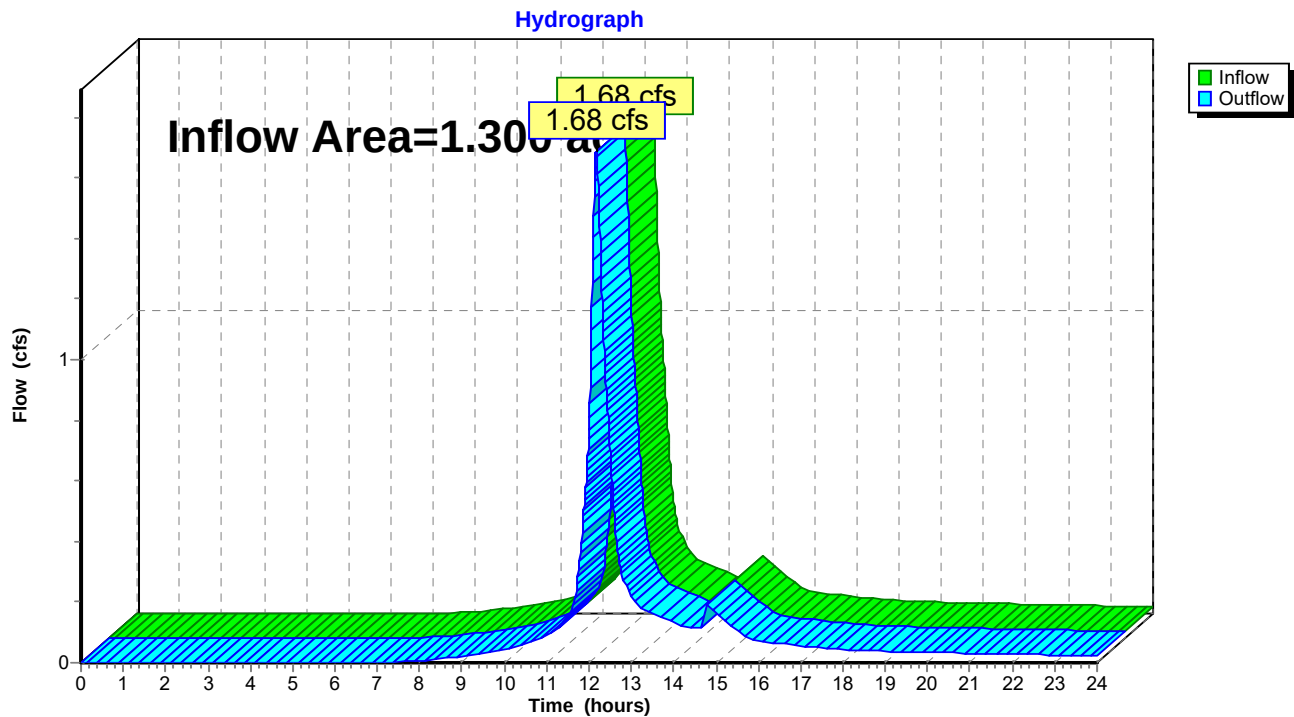
Page 35

Summary for Reach DP-2: DP-2-Sawin's Pond

Inflow Area = 1.300 ac, 72.92% Impervious, Inflow Depth > 1.40" for 100-Year Storm event
Inflow = 1.68 cfs @ 12.17 hrs, Volume= 0.152 af
Outflow = 1.68 cfs @ 12.17 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach DP-2: DP-2-Sawin's Pond



Proposed conditions

Type III 24-hr 100-Year Storm Rainfall=8.14"

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Summary for Pond Pond: Porous Asphalt

Inflow Area = 0.948 ac, 100.00% Impervious, Inflow Depth > 7.89" for 100-Year Storm event
 Inflow = 7.58 cfs @ 12.08 hrs, Volume= 0.624 af
 Outflow = 0.26 cfs @ 14.69 hrs, Volume= 0.270 af, Atten= 97%, Lag= 156.4 min
 Discarded = 0.16 cfs @ 7.57 hrs, Volume= 0.266 af
 Primary = 0.09 cfs @ 14.69 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2
 Peak Elev= 32.00' @ 14.69 hrs Surf.Area= 41,289 sf Storage= 16,516 cf

Plug-Flow detention time= 250.6 min calculated for 0.270 af (43% of inflow)
 Center-of-Mass det. time= 99.1 min (839.5 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	31.00'	16,516 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 41,289 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.00	41,289	0	0
32.00	41,289	41,289	41,289

Device	Routing	Invert	Outlet Devices
#1	Discarded	31.00'	0.170 in/hr Exfiltration over Horizontal area
#2	Primary	32.00'	775.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 7.57 hrs HW=31.01' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.02 cfs @ 14.69 hrs HW=32.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.05 fps)

Proposed conditions

Prepared by Engineering Alliance, Inc.

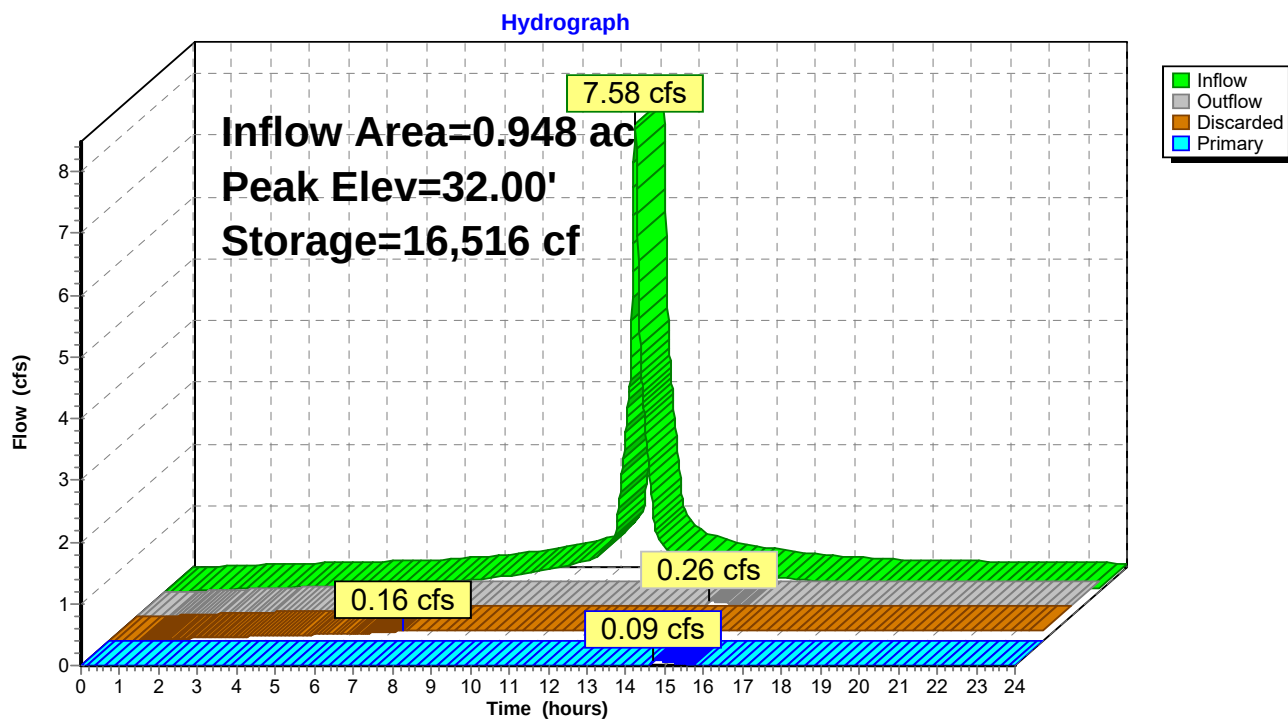
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Type III 24-hr 100-Year Storm Rainfall=8.14"

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Pond Pond: Porous Asphalt



BEST MANAGEMENT PRACTICES OPERATION AND MAINTENANCE PLAN

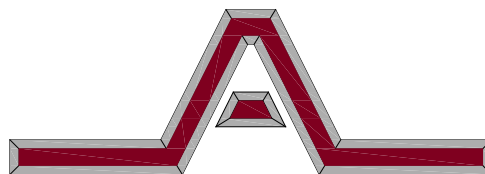
**For The
Proposed Parking Improvements**

**Located at
Arlington Street & Coolidge Avenue
Watertown, Massachusetts**

***Submitted to:*
City of Watertown
Planning Board
149 Main Street
Watertown, Massachusetts 02472**

***Prepared for:*
Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472**

Prepared by



Engineering Alliance, Inc.

Civil Engineering & Land Planning Consultants
194 Central Street
Saugus, MA 01906
Tel: (781) 231-1349
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Portsmouth, NH 03801
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December 12, 2022

BEST MANAGEMENT PRACTICES OPERATION AND MAINTENANCE PLAN

The purpose of this Best Management Practices Operation and Maintenance plan is to provide guidance for mandatory maintenance procedures of site preparation and pre and post construction activities for the project located at Arlington Street & Coolidge Avenue in Watertown, Massachusetts.

The Best Management Practices Operation and Maintenance Plan is summarized below and will be incorporated into the construction documents for this project. This plan is broken into two major sections. The first section is construction-related erosion and sedimentation controls. The second section is devoted to a post-development operation and maintenance plan.

Basic Information

Owner/Maintenance Responsibilities:

Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

Inspector:

Maximos Hatziliades
71 Arlington Street
Watertown, MA 02472

In the event that the property ownership changes, this Operation and Maintenance Plan shall continue to run with the land and apply to any successors or assigns. Upon the conveyance of land, the City of Watertown shall be notified in writing indicating the new ownership's contact information within 48 hours of the conveyance.

Prior to the conveyance of the property, an educational meeting shall be held between the current owner, the new owner and the parties responsible for the maintenance of the stormwater management facility. The purpose of the meeting will be to educate the new owner on the maintenance responsibilities for the stormwater management facility including, but not limited to:

- Description of system components
- Required maintenance of each component
- Frequency of maintenance of each component

This document shall be updated to indicate the time and date of the meeting as well as the contact information for the new property owner.

Time and Date of Educational Meeting: _____

New Owner Information

Acknowledgement of Storm Water Management Maintenance Responsibilities:

Owner Signature

Date

Acknowledgement of Storm Water Management Maintenance Responsibilities:

Management Company Representative Signature

Date

Maintenance Budget

A compounding annual budget of **\$1,500 per year** shall be set aside to maintain and/or replace the stormwater management system. This budget shall cover the cost of:

- Parking Lot Sweeping
- Replacement of Porous Asphalt and Tree Box Filter Stone Bed

Section 1 - Construction Activities & Erosion Controls

1. Contact the Watertown Conservation Commission at least three (3) days prior to start of construction.
2. The contractor shall only disturb the minimum area necessary in order to limit the impact on the surrounding area including the bordering vegetated wetlands and abutting residential developments.
3. A stabilized construction entrance shall be installed at the project site entrances. Vehicle wash down shall occur on the gravel surface that is adjacent to or part of the stabilized construction entrance.
 - a. Stabilized construction entrance will be installed from the existing pavement on site to minimize sediment track-out.
 - b. Entrance should be maintained in a condition that will prevent tracking or flowing of sediment off the project site. May require periodic topdressing with additional stone.
 - c. Entrance and sediment disposal area shall be inspected weekly and after heavy rains or heavy use.
 - d. Mud and sediment tracked or washed onto public road shall be immediately removed.
 - e. Once mud and soil particles clog the voids in the gravel and the effectiveness of the gravel pad is no longer satisfactory, the pad must be topdressed with new stone. Replacement of the entire pad may be necessary when the pad becomes completely clogged.
 - f. Pad shall be reshaped as needed for drainage and runoff control.
 - g. Broken road pavement as a result of construction activities on roadways immediately adjacent to the Project Site shall be repaired immediately.
4. Install haybales and silt fence around the proposed work zone to prevent sediment from leaving the subject property. Haybales and silt fence are to be inspected on a weekly basis. Any damaged or compromised erosion control measures are to be replaced immediately.
5. Proper erosion and sediment control must be employed around all material stockpile areas. Regular provisions for dust control must be used, via a water truck or other acceptable method. Erosion and sediment controls around material stockpile areas are to be inspected on a weekly basis. Any damaged or compromised erosion control measures are to be replaced immediately.
6. Waste material is to be stored in a dumpster on site and covered at all times. Waste material dumpster is to be maintained to ensure no overtopping or leaks will occur.
7. Construction materials are to be stored onsite and covered at all times.
8. If necessary, dewatering shall include all necessary control, management, and disposal of groundwater on a 24-hour basis as appropriate during construction. Dewatering shall include the lowering of the groundwater table to relieve any hydrostatic head that could cause a decrease in the stability of the excavated subgrade. It shall also include the intercepting seepage which could otherwise emerge from the slope or sides of excavations which could cause a decrease in the stability of the excavated subgrade of the slopes or sides of the excavations.

Dewatering shall be performed during construction to temporarily protect against the following.

1. The loss of any material beneath the excavated subgrade or from the slopes or sides of the excavations or the movement of any fine particle materials from the soil.
2. Any increased vertical or lateral loads on the excavation support systems.
3. Any disturbance, rupture, instability, build, or heaving of the bottom of the excavated subgrade during excavation and trenching, placement of foundation or bedding materials, construction of slabs, footings, pipes, conduits, underdrains, and any other structures, and backfilling operations.

The dewatering systems and equipment shall be removed from the site when no longer required.

9. Slopes exceeding 3(H):1(V) shall be stabilized with temporary seeding. All slopes are to be checked periodically to see that vegetation is in good condition. Any damage from erosion or animal burrowing should be repaired immediately to prevent further damage. Areas requiring revegetation should be repaired immediately. Slopes should be limed and fertilized as necessary to keep vegetation healthy. Control undesirable vegetation such as weeds and woody growth to avoid bank stability problems in the future.
10. The entire project area shall be swept upon completion of construction and prior to removal of the erosion control devices.
11. All disturbed areas of the worksite must be stabilized during the winter months (October 15th – April 15th) by placement of approximately six (6) inches of hay mulch or straw.
12. Refueling of machinery is to occur offsite whenever possible. Any necessary onsite refueling shall occur within the designated refueling area.

Construction Sequencing

1. Install erosion control measures per plan.
2. Clear and grub only where necessary.
3. Fine grade site.
4. Install site curbing.
5. Install porous asphalt.
6. Install signing and striping.
7. Install landscaping and tree box filters.
8. Remove erosion control devices.

Spill Prevention and Response

Prevention:

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff:

1. An effort will be made to store only the amount of material required to do the job.
2. All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
3. Products will be kept in their original containers with the original manufacturer's label.
4. Substances will not be mixed with one another unless recommended by the manufacturer.
5. Whenever possible, all of a product will be used up before disposing of the container.
6. Manufacturer's recommendations for proper use and disposal will be followed.
7. The site superintendent will inspect daily to ensure proper use and disposal of materials onsite.
8. Products will be kept in the original containers unless they are not re-sealable.
9. Original labels and material safety data will be retained; they contain important product information.
10. If surplus product must be disposed of, manufacturers or local and State recommended methods for proper disposal will be followed.
11. Petroleum Products – All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers that are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.
12. Paints – All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to the manufacturer's instructions or State and local regulations.
13. Fertilizers – Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to stormwater. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.
14. Concrete Trucks - Concrete Trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on the site.

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and clean-up:

1. Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
2. Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
3. All spills will be cleaned up immediately upon discovery.
4. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
5. Spills of toxic or hazardous substances will be reported to the appropriate State or local government agency, regardless of the size.
6. The spill prevention plan will be adjusted to include measure to prevent this type of spill from reoccurring and how to clean up the spill if there should be another. A description of the spill, what caused it, and the cleanup measure will also be included.
7. The Site Superintendent responsible for the day-to-day site operation will be the spill prevention and cleanup coordinator.

Fueling and Maintenance of Equipment or Vehicles

General:

Vehicle and equipment fueling procedures are designed to prevent fuel spills and leaks in order to minimize the discharge of such pollutants into storm drains and waterways.

Implementation:

Offsite fueling stations should be used as much as possible. • When fueling offsite is not practicable, a designated fueling area away from drainage ways must be used. • Locate designated fueling areas a minimum of 50 feet away from concentrated flows of stormwater, drainage ways, and inlets. • An impermeable surface should be used at the designated fueling area. • Containment should be built around the designated fueling areas to prevent the release of spills, as well as runoff and runon. • Absorbent spill cleanup materials should be available at all designated fueling areas. If absorbent materials are used on spills, the material is to be removed immediately and disposed of properly. • Fueling nozzles should be equipped with an automatic shutoff to control drips. • Topping off of fuel tanks should be discouraged. • A sign is to be installed adjacent to each fueling facility to inform equipment operators of the designated fueling location. • For larger equipment, such as cranes and excavators that are not able to travel to a designated fueling area, mobile fueling may be necessary. Absorbent spill cleanup materials and spill kits should be available on all fueling trucks. Drip pans or absorbent pads should be used in mobile fueling operations. • The contractor shall train his/her employees and subcontractors in proper fueling and cleanup procedures. These procedures must be documented.

Inspection/Maintenance:

The contractor should inspect vehicles and equipment for leaks each day they are used. Leaks are to be repaired immediately or the piece of equipment should be removed from the project site. • Designated fueling areas should be inspected for leaks and spills each day they are used. Any leaks or spills are to be cleaned up immediately. • Any leaks or spills discharged through a drainage system will require the preparation of an Incidence of Non-Compliance. • Update the SWPPP anytime a designated fueling location has been removed, relocated, added, modified, or required maintenance.

Washing of Equipment and Vehicles

Wash water from vehicle and equipment cleaning is not to be discharged from construction sites because the rinse water may contain contaminants such as sediment, petroleum/lubricant residues, soaps, or solvents that could enter storm drain systems or receiving waters.

Equipment/vehicle cleaning should be conducted offsite. All vehicles that regularly enter and leave the construction site must be cleaned offsite.

For equipment that must be cleaned on site, the cleaning operations must be fully contained and disposed of offsite. The vehicle wash area must be properly identified by sign and located away from storm drain inlets, drainage facilities, and watercourses. It must be paved with concrete or asphalt and have a berm to contain runoff and prevent run-on. It must be equipped with a sump for the collection and disposal of wash water.

Section 2 – Post Development Operation & Maintenance

1. Porous Asphalt – Porous asphalt areas should be maintained periodically to maintain infiltration. Care should be taken to keep sediment off the pavement during and after construction. Monthly (12 times per year) cleaning by a vacuum-type street cleaner should be performed when the pavement is dry. Vacuum settings should be adjusted to prevent the uptake of aggregate in the pavement openings and joints. It is important to keep the drainage voids and joints filled with aggregate. Replenishment can be done, if needed, at the time of cleaning. Acceptable types of vacuum sweepers include the Elgin Whirlwind and the Allianz Model 650 or approved equal.

If the pavement surface has become significantly clogged such that routine vacuum sweeping does not restore permeability, then a more intensive level of treatment may be required. The porous pavement areas shall be washed with clean, low pressure water, followed by immediate vacuuming. Combinations of washing and vacuuming techniques have proved effective in cleaning both organic clogging as well as sandy clogging. Research has found that a “power head cone nozzle” that “concentrated the water in a narrowly rotating cone” worked best. (Note: if the pressure of the washing nozzle is too great, contaminants may be driven further into the porous surface.) Maintenance crews are encouraged to determine the most effective strategy of cleaning their porous installations. Winter maintenance for a porous parking lot may be necessary, but is usually less intensive than that required for a standard asphalt lot. By its very nature, a porous pavement system with subsurface aggregate bed has superior snow melting characteristics than does standard pavement. Therefore, ice and light snow accumulation are generally not as problematic. However, snow will accumulate during heavier storms. Abrasives such as sand or cinders should not be applied on or adjacent to the porous pavement. Snow plowing is necessary for significant snow accumulation, but should be done carefully. Standard road salt is acceptable for use as a deicer on porous pavement, although a non-toxic, organic deicer, applied either as a blended, magnesium chloride-based liquid product or as pretreated rock salt, is recommended. Acceptable liquid deicers include Magic-O, Ice B’ Gone, Ice Ban, and Geomelt, or approved equal. Magic Salt or approved equal is an example of an acceptable pretreated salt product. Other acceptable deicer alternatives to standard sodium chloride include calcium chloride, magnesium chloride, potassium chloride, urea, and calcium magnesium acetate. Follow supplier recommendations when applying deicers to pavement.

Repairs shall be made with porous asphalt mix. If an area greater than 50 SF is in need of repair, approval of patch type must be sought from either the engineer or owner. Under no circumstance is the pavement surface to ever be seal coated. Any required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.

2. Street Sweeping - Paved areas shall be swept by street sweepers periodically during dry weather to remove excess sediments, reducing the amount of sediments that the drainage system will have to remove from the runoff. **At a minimum all paved areas must be swept on a monthly average, with sweeping scheduled primarily in the spring and fall.**
3. Snow removal and storage - Plowed snow shall be placed in the pervious area located within and surrounding the parking area where it can slowly infiltrate. Sediments shall be removed from this area every spring. When the amount of snow exceeds the capacity of the snow storage areas, it shall be removed from the site and disposed of properly immediately after each storm at the owner’s expense.
4. Pesticides, Herbicides, and Fertilizers - Pesticides and herbicides shall not be used within the limits of the 100-foot buffer zone to any wetland resource areas as defined under 310 CMR 10.00. In addition, fertilizers that are used within this zone should be restricted to the use of organic fertilizers only.
5. Maintenance Responsibilities - All post construction maintenance activities should be documented and kept on file and made available to the Conservation Commission or Planning Board upon request. All post construction maintenance activities shall survive the conditions of approval and shall run with the title of the property.

All structural BMP’s as identified on the site plans will be owned and maintained by the owner of the property.

Arlington Street and Coolidge Avenue

Watertown, MA
BMP Maintenance Log

BMP STRUCTURE	INSPECTOR (NAME)	WORK PERFORMED	DATE PERFORMED	COMMENTS
Porous Asphalt				
Tree Box Filter				
Other				
Additional Comments:				

APPENDIX D

**Stormwater Checklist & Miscellaneous
Drainage Calculations**



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 8²
- 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.



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.

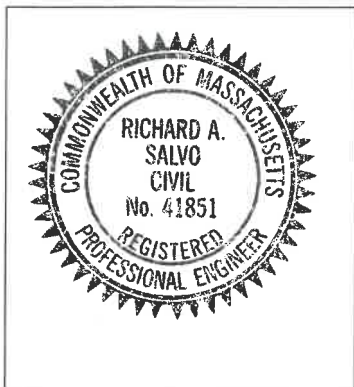
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



RSR 12.12.2022
Signature and Date

Checklist

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

- ☐ New development
- ☒ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

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

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

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 Field¹
- ☐ 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.



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TSS Removal Calculations

Name:	Proposed Commercial Re-development	Proj. No.:	09-27801
	Watertown, MA	Date:	2/15/2011
Client:	Maximos Hatziliades	Computed by:	ABS
County:	Middlesex	Checked by:	RAS

A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Street Sweeping	5	1.00	0.05	0.95
Porous Asphalt	80	0.95	0.76	0.19
Total TSS Removal=			81%	

Notes:
 *Starting TSS Load for first BMP= 1.00. TSS load for subsequent BMP's is equal to the Remaining Load (E) from the previous BMP.

Project: Proposed Commercial Re-development
Client: Maximos Hatziliades
Project Number: 09-27801

Prepared By: ABS
Checked By: RAS
Date: 12/12/22



STANDARD 3: REQUIRED RECHARGE VOLUME

$$R_v = F \times \text{impervious area}$$

R_v = Required Recharge Volume

F = Target Depth associated with each Hydrologic Soil Group

Impervious Area = pavement and rooftop on site

Impervious Area: 41,289 sf = 0.95 acres

Hydrologic Group	Volume to Recharge
A	0.60
B	0.35
C	0.25
D	0.10

$$R_v = 0.95 \times 0.25 \times \frac{1 \text{ ft}}{12 \text{ in.}} \times \frac{43,560 \text{ sf}}{1 \text{ ac.}} = 860 \text{ CF}$$

Capture Area Adjustment

Total Impervious Area:	41,289 sf
Pervious Pavement Area:	41,289 sf
Ratio (Total Imp. Area/Imp. Area to Recharge):	1.00
Adjusted Min. Required Recharge Volume ($R_v \times \text{Ratio}$):	860 CF

NOTES:

- See attached HydroCad models for the volume recharged by the porous asphalt. Only the volume provided by the filter course (bank run gravel) is considered storage. **16,516 CF > 860 CF**

DRAWDOWN WITHIN 72 HOURS

$$\text{Time}_{\text{drawdown}} = \frac{\text{Recharge Volume}}{K(\text{Bottom Area})(n)}$$

K = Saturated Hydraulic Conductivity
 n = porosity

Porous Asphalt

$$\text{Time}_{\text{drawdown}} = \frac{16,516}{(0.17 \text{ in/hr})(1/12 \text{ ft/in})(41289 \text{ sf})} = 28.2 < 72 \text{ HRS}$$

NOTES:

- K value is for sandy clay loam as shown in Table 2.3.3, entitled "1982 Rawls Rates," in the MADEP Stormwater Management Standards.

Project: Proposed Commercial Re-development
Client: Maximos Hatziliades
Project Number: 09-27801

Prepared By: ABS
Checked By: RAS
Date: 12/12/22



STANDARD 4: WATER QUALITY

WATER QUALITY TREATMENT VOLUME

$$V_{WQ} = (D_{WQ} \text{ in.} / 12 \text{ inches/foot}) \times (A_{IMP} \times 43,560 \text{ square feet/acre})$$

V_{WQ} = Required Water Quality Volume (in cubic feet)
 D_{WQ} = Water Quality Depth
 A_{IMP} = Impervious Area (in acres)

$$V_{WQ} = (0.5 \text{ in.} / 12 \text{ inches/foot}) \times (0.95 \times 43,560 \text{ square feet/acre}) = \boxed{1,924 \text{ CF}}$$

<u>Stormwater BMP</u>	<u>Volume</u>
Porous Asphalt	16,516
Total	16,516

NOTES:

1. Storage volumes for the stormwater BMP obtained from the hydrologic models used for Standard 3.

CONCLUSION:

1. The storage volume provided by the proposed BMP is greater then the required water quality treatment volume.

ILLICIT DISCHARGE COMPLIANCE STATEMENT

In accordance with the Wetland Regulations found in 310 CMR 10.05(6) and the *Massachusetts Stormwater Handbook* published by the Massachusetts Department of Environmental Protection, the stormwater management system for the proposed project located at 87 Arlington Street and Coolidge Avenue in Watertown, Massachusetts shall accept no illicit discharges. Illicit discharges are defined as discharges not entirely comprised of stormwater and include, but are not limited to, wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Engineering Alliance, Inc. has performed an investigation of the existing site conditions and did not find any illicit discharges. Prior to construction, additional investigations will take place to identify and remove any and all illicit discharges currently onsite. These actions include, without limitation, visual screening, dye or smoke testing, and the removal of any sources of illicit discharges to the stormwater management system.

Should any illicit discharges enter the stormwater management system after construction has been completed, immediate steps to remove the discharges and their source shall be taken to return the system to its proper working state.



Richard A. Salvo, P.E.
for Engineering Alliance, Inc.

12/12/22

Date